East West University

A Survey on Soft Drinks Intake Behaviour among University Going Students

A thesis report submitted to the Department of Pharmacy, East West University, Bangladesh, in partial fulfillment of the requirements for the Degree of Bachelor of Pharmacy.

Submitted by:

Md. Nazmul Haque

ID: 2013-3-70-072

Research Supervisor:

M. Saleh Yunus

Lecturer

Department of Pharmacy

EAST WEST UNIVERSITY

January 2018

Declaration by the Research Candidate

I, **Md. Nazmul Haque**, hereby declare that the dissertation entitled **"A Survey on Soft Drinks Intake Behaviour among University Going Students"** is submitted by me to the Department of Pharmacy, East West University, in the partial fulfillment for the award of the degree of Bachelor of Pharmacy, is a record of original research work conducted by me under the supervision of **M. Saleh Yunus**, Lecturer, Department of Pharmacy, East West University and it has not formed on the basis for the award of any other Degree/Diploma/fellowship or other similar title to any candidate to any University.

_____

Md. Nazmul Haque
ID: 2013-3-70-072
Department of Pharmacy
East West University

Certification by the Supervisor

This is to certify that the dissertation entitled **"A Survey on Soft Drinks Intake Behaviour among University Going Students"** is a research work done by **Md. Nazmul Haque (ID:2013-3-70-072)**, in partial fulfillment of the requirement for the degree of Bachelor of Pharmacy under my supervision.

_____

M. Saleh Yunus
Lecturer
Department of Pharmacy
East West University

Certified by the Chairperson

This is to certify that the dissertation entitled **"A Survey on Soft Drinks Intake Behaviour among University Going Students"** is a genuine research work carried out by **Md. Nazmul Haque**, ID: 2013-3-70-072, under the supervision of **M. Saleh Yunus** (Lecturer, Department of Pharmacy, East West University) in partial fulfillment of the requirements for the Degree of Bachelor of Pharmacy. I further certify that no part of the thesis has been submitted for any other degree and all the resources of the information under this connection are duly acknowledged.

_____

Dr. Chowdhury Faiz Hossain

Professor and Chairperson

Department of Pharmacy

East West University

Acknowledgement

At first, I would like to thank Almighty Allah for enabling me to successfully complete my research work soundly and orderly.

I would like to express my deepest gratitude to my supervisor, **M. Saleh Yunus**, Lecturer, Department of Pharmacy, East West University, for his cordial support throughout this research project. His generous advice, constant supervision, intense support and enthusiastic encouragements during the research work helped me to shape this research in a better way. His motivation, support, patience and advices have made it possible for me to complete this research.

I put forward my sincere regards and profound gratitude to Chairperson **Dr. Chowdhury Faiz Hossain,** Department of Pharmacy, East West University**.**

I want to express my sincere thankfulness to my mother **Nasima Haque** for her support and guidance all through my life, including that for my research project.

I also express my sincere gratitude to my younger brother **Sohanur Rahman Sohag** for his support throughout this research project.

I want to give special thanks to my dear friends **Nahida Akter, Md Kamrul Hassan Joy, Nasib Rahman Arafat** and **Samiul Islam** for their support and guidance throughout this research project.

I would like to express my sincere gratitude to all of my friends for their kind cooperation and support to complete my study including my research project.

I would like to thank all the students who have shown their interest and support during data collection for my research project.

Dedication

This Research Paper is dedicated to

My beloved parents,

Who are my biggest inspirations...

Abstract

OBJECTIVE: The research was carried out to find out soft drinks intake behavior among the university going students.

METHOD: The study included finding out information regarding soft drinks intake behavior and the amount of soft drinks consumption in daily life of students.

DESIGN: A standardized questionnaire introduced to student to collect their response.

SETTING: East West University, Dhaka.

SUBJECTS: 445 students of the university. Among them 298 were male and 147 were female.

INTERVENTIONS: A Survey, questionnaire composed of soft drinks intake related questions, amount of soft drinks consumption related questions, health concerns because of consuming soft drinks related questions etc.

RESULTS: Among 445 students 23% students consumed soft drinks randomly, 18% few times a week, 14% once a day, 13% after taking junk food, 13% after taking rich food, 12% more than once a day, 6% after doing any kind of sports and only 1% students never consumed soft drinks. 36% students consumed 125-250 ml soft drinks at a time, 35% consumed less than 125 ml, 25% consumed 250-500 ml and 4% consumed more than 250 ml. 47% students did not think diet drinks are better than normal drinks 35% students felt addicted to soft drinks.

CONCLUSION: During this study it has been observed that majority of the university students consume different type of soft drinks at different intervals. Though majority of them know about the complications that occur by consuming soft drinks, they spend a good amount of pocket money on soft drinks. Approximately half of them think diet drinks is not better than normal soft drinks. A few of them felt addicted to soft drinks. Healthy eating messages for adolescents need to be developed and incorporated into existing and future campaigns to reinforce the perception that there are other healthier drinks that quench thirst and that taste good as well.

Contents

Chapter 1: Introduction

Chapter 2: Literature Review

List of Figures

CHAPTER-1

INTRODUCTION

1.1 Soft Drink

A nonalcoholic drink, especially one that is carbonated. (Oxford Dictionaries | English, 2017) The term soft drink was originated to distinguish the flavoured drinks from hard liquor, or distilled spirits. Soft drinks were recommended as a substitute in the effort to change the hard-drinking habits of early Americans. Indeed, health concerns of modern consumers led to new categories of soft drinks emphasizing low calorie count, low sodium content, no caffeine, and "all natural" ingredients. (Zidbits - Learn something new everyday!, 2017).

Fig 1.1: Various soft drinks in a supermarket.

1.2 History of Soft Drinks

The first marketed soft drinks appeared in the 17th century as a mixture of water and lemon juice sweetened with honey. In 1676 the Compagnie de Limonadiers was formed in Paris and granted a monopoly for the sale of its products. Vendors carried tanks on their backs from which they dispensed cups of lemonade.

Carbonated beverages and waters were developed from European attempts in the 17th century to imitate the popular and naturally effervescent waters of famous springs, with primary interest in their reputed therapeutic values. The effervescent feature of the waters was recognized early as most important. Flemish scientist Jan Baptista van Helmont first used the term gas in his reference to the carbon dioxide content. French physician Gabriel Venel referred to aerated water, confusing the gas with ordinary air. British scientist Joseph

Black named the gaseous constituent fixed air. Robert Boyle, an Anglo-Irish philosopher and scientist who helped found modern chemistry, published his Short Memoirs for the Natural Experimental History of Mineral Waters in 1685. It included sections on examining mineral springs, on the properties of the water, on its effects upon the human body, and, lastly, "of the imitation of natural medicinal waters by chemical and other artificial ways."

Numerous reports of experiments and investigations were included in the Philosophical Transactions of the Royal Society of London in the late 1700s, including the studies of Stephen Hales, Joseph Black, David Macbride, William Brownrigg, Henry Cavendish, and Thomas Lane.

Fig 1.2: Soft Drinks

English clergyman and scientist Joseph Priestley is nicknamed "the father of the soft drinks industry" for his experiments on gas obtained from the fermenting vats of a brewery. In 1772 he demonstrated a small carbonating apparatus to the College of Physicians in London, suggesting that, with the aid of a pump, water might be more highly impregnated with fixed air. French chemist Antoine-Laurent Lavoisier made the same suggestion in 1773.

To Thomas Henry, an apothecary in Manchester, England, is attributed the first production of carbonated water, which he made in 12-gallon barrels using an apparatus based on Priestley's design. Swiss jeweler Jacob Schweppe read the papers of Priestley and Lavoisier and determined to make a similar device. By 1794 he was selling his highly carbonated artificial mineral waters to his friends in Geneva; later he started a business in London.

Fig 1.3: Advertisement of Soft drinks

At first, bottled waters were used medicinally, as evidenced in a letter written by English industrialist Matthew Boulton to philosopher Erasmus Darwin in 1794. J. Schweppe prepares his mineral waters of three sorts. No. 1 is for common drinking with your dinner. No. 2 is for nephritick patients and No. 3 contains the most alkali given only in more violent cases". By about 1820, improvements in manufacturing processes allowed a much greater output, and bottled water became popular. Mineral salts and flavours were added—ginger about 1820, lemon in the 1830s, tonic in 1858. In 1886 John Pemberton, a pharmacist in Atlanta, Georgia, invented Coca-Cola, the first cola drink. (Encyclopedia Britannica, 2017)

1.3 Origin of the Name of Soft Drinks

The word 'soft drink' owes its origin to simple advertising. The makers of artificial (and natural) flavored carbonated beverages were having a difficult time marketing their product nationally thanks to the fact that the name for these beverages varied from region to region and even city to city. For instance, in different parts of the United States and Canada, flavored carbonated beverages can be referred to as pop, and in other parts, soda, in yet other parts there are other names. Internationally, it's even more difficult. For example, in England soft drinks are called "fizzy drinks" in Ireland they were called "minerals". So because they couldn't refer to their product in the generic sense on national (or international) advertisements, the manufactures chose the term "soft drink" to be more or less a universal term for their non-alcoholic carbonated beverages. However, according to study carried out in 2006, research showed that most carbonated soft drinks actually do contain trace amounts of alcohol. (Zidbits - Learn something new everyday!, 2017)

1.4 Ingredients of Soft Drinks

1.4.1 Acids:

Acids are used in soft drinks for two main reasons. To slow the growth of micro-organisms (yeasts, moulds and bacteria).To improve the taste of a drink by balancing the sweetness. The three most commonly used acids are:

Citric Acid (E330) - the natural acid in citrus fruits

Malic Acid (E296) - the natural acid in apple

Phosphoric acid (E338) – traditionally used in colas

1.4.2 Carbon dioxide (CO_2):

Carbon dioxide is used to put the fizziness in soft drinks. It is a non-toxic, inert, virtually tasteless gas. The amount of carbon dioxide added is dependent upon the type of soft drink. Lightly carbonated drinks are usually fruity, lemonade and colas have medium carbonation and mixers, like tonic water, are highly carbonated. Carbon dioxide can occur naturally and some bottled waters are naturally sparkling.

1.4.3 Colours:

Colours are used in soft drinks to make the product more aesthetically appealing and help preserve the identity or character by which drinks are recognized. There are three basic categories of colourings. Natural colours, artificial colours and caramels.

1.4.3.1 Natural colours:

These can be extracted from plants, fruits and vegetables and can also be manufactured synthetically. There are two main categories:

1. Carotenoids – which give a range of yellow to orange colours

2. Anthocyanins – which give a range of bright red to purple colours

1.4.3.2 Artificial colours:

A full range of colours can be obtained, blue, green, red, yellow etc. All permitted artificial colours used in soft drinks have been thoroughly tested and approved as safe. However, due to increasing consumer preference for natural colours, the trend in the UK market in recent years has been for manufacturers and retailers to reduce the use of artificial colours in their products.

1.4.4 Caramel

Caramels are one of the oldest and most widely used colours. They are used in cola and ginger ale drinks and can also be used in beer and shandies.

1.4.5 Flavourings

Flavours are present in virtually every soft drink. They may be obtained from natural or artificial sources and are used to respond to increasing consumer demands for a wide spectrum of different tasting foods and drinks. Natural flavours are derived from a wide range of fruits, vegetables, nuts, bark, leaves, herbs, spices and oils. Artificial flavours are manufactured synthetically.

1.4.6 Intense sweeteners

Intense sweeteners are non-sugar substances that can be added to food and drink products instead of sugar. They are many times sweeter than sugar which means that much lower quantities are needed to give a product the desired sweet taste. The development in use of intense sweeteners dates back to the First World War when the supply of sugar was limited. Manufacturers have found that blending different intense sweeteners, sometimes with sugar, can lead to better product taste profiles. For this reason, many manufacturers use blends of sweeteners rather than one single intense sweetener in their drinks. The most commonly used intense sweeteners in UK soft drinks are:

- Acesulfame-K (E950)

- Aspartame (E951)
- Saccharin (E954)
- Steviol Glycosides (E960)
- Sucralose (E955)

1.4.6 Preservatives

Preservatives allow products to have a longer shelf life by slowing or stopping the growth of micro-organisms (yeasts, moulds and bacteria). Not all soft drinks contain preservatives; the need for a preservative depends on the type of product and the processing used. Soft drinks containing fruit juice and sugar typically need preservative to prevent microbiological spoilage. There are four permitted preservative for soft drinks. Benzoates (E210-E213), Sorbates (E200-E203), Suphite (E220-E228), Dimethyldicarbonate (E242).

1.4.7 Sugars (sucrose, glucose and fructose)

Sweetness in soft drinks has traditionally been provided by sugar (sucrose) extracted from beet or cane. In the presence of acid, as in soft drinks, sucrose (a disaccharide of glucose and fructose) will hydrolyses to form an equal mixture of the mono saccharide glucose and fructose. Therefore in soft drinks, you will find a mixture of the three sugars. This also happens to the sucrose in fruit juices. Glucose and fructose syrups may also be used to give sweetness. All sugars have the same calorific content approx. 4kcals/g but have different levels of sweetness, e.g. fructose is slightly sweeter than sucrose and glucose is less sweet than sucrose.

1.4.8 Water

Water is the main ingredient in all drinks; for carbonates it is around 90% of a regular product and 98% of a low calorie product. The majority of the water used in soft drinks production comes from mains water. However, spring water or natural mineral water may be used and this is indicated on the product label. If mains water is used it must undergo further treatment before it can be used for production. This is because the water in a soft drink acts

as the solvent for all the other ingredients; therefore its quality is of prime importance. Each soft drink company will have its own treated water requirements covering physical, chemical and microbiological and taste characteristics. (Britishsoftdrinks.com, 2017)

1.5 Statistical Data on Consumption of Soft Drinks

Soft drinks can be part of a healthy and balanced lifestyle because they are important contributors to hydration and light beverages can be an integral part of weight loss plans.

Soft drinks are available in a wide variety of flavours, formats and packaging to suit every drinking occasion. No- and low-calorie drinks now account for up to 30% of sales in many European markets and enable people to refresh themselves without any sugar or calories. Published data shows that soft drinks contribute just 3% of calories to the daily diet of the average European and recent studies demonstrate the efficacy of no-calorie soft drinks in achieving weight loss as part of a calorie controlled diet. Soft drinks play an essential role in hydration. Keeping the body well hydrated is important in ensuring optimum mental and physical functioning in humans. It is recommended that we consume 2-3 litres of fluid each day, comprising both drinks and foods such as fruit and vegetables. (Unesda, 2017)

The non-alcoholic beverages industry encompasses liquid refreshment beverages (LRB) such as bottled water, carbonated soft drinks, energy drinks, fruit beverages, ready-to-drink coffee and tea, sports beverages and value-added water. The dollar sales of this category amounted to 1,079.2 billion U.S. dollars worldwide in 2014. Within the segment, carbonated soft drinks were responsible for the lion's share of global sales. A comparison of the world regions revealed, that the consumption patterns of full calorie and diet soft drinks strongly differ among the nations. In North America, for example, 69 percent of all soft drinks are consumed as the full calorie version. (www.statista.com, 2017)

Statistic depicts the per capita consumption of soft drinks in the United States from 2010 to 2015. In 2015, some 40.7 gallons of soft drinks were consumed per capita, down from 45.5 gallons per capita in 2010. In 2016, energy drinks accounted for a market share of about 10.2 percent of the U.S. soft drink segment. (Statista, 2017)

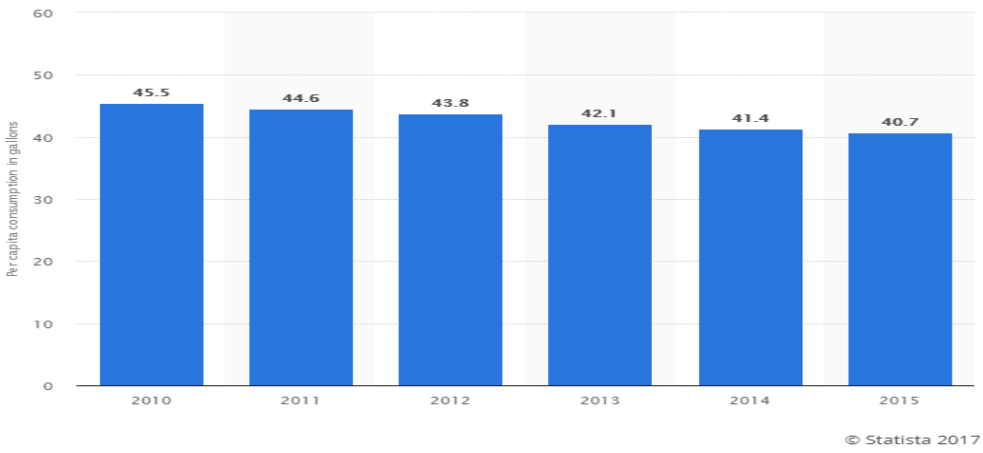

Fig 1.4: Consumption of soft drinks per year

An industry analysis of the American soft drinks market carried out by Beverage Digest identified The Coca-Cola Company, PepsiCo or Dr Pepper Snapple as dominating players. Coke was the leading carbonated soft drink brand in the United States in 2015, capturing a market share of about 17.7 percent. Recent statistics show that Americans drank about 40.7 gallons of soft drinks per capita in 2015. (www.statista.com, 2017)

Total volume declined 1.2% in 2015, an acceleration from 2014's 0.9% drop, as the biggest three players in the category all reported falling demand, according to a new report from industry tracker Beverage Digest. The group also reported that annual per capita consumption of carbonated soft drinks dropped to about 650 eight-ounce servings in 2015 – the lowest since 1985. Slumping demand for diet sodas sold by PepsiCo and Coca Cola propelled a decline for the broader industry, as overall sales of carbonated soft drinks dropped for the 11th consecutive year in the U.S. PepsiCo (PEP, -0.85%) suffered the steepest decline among the biggest soda makers, with a 3.1% volume drop. The declines for Coke (KO, -0.35%) and Dr Pepper Snapple (DPS, -0.70%) were not as steep as the industry, meaning those soda makers actually grew market share in a down market.

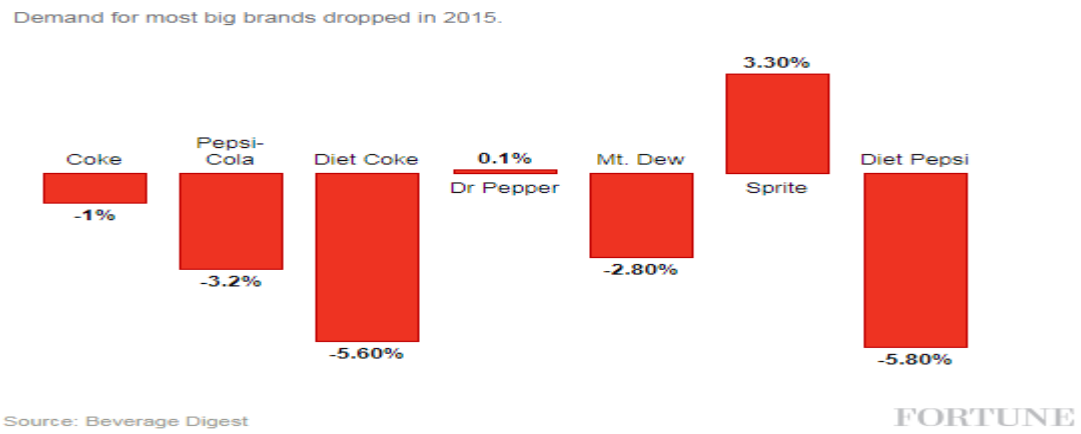

Fig 1.5: Demand of soft drinks per brand

Along those lines, the big losers were yet again the diet soda brands. Diet Pepsi and Diet Coke each reported declines of over 5%, while Diet Mountain Dew's drop was 4.8%. That's because consumers have becoming increasingly skeptical of artificial sweeteners, most recently fretting about the health implications of consuming aspartame, which is still deemed safe by the Food and Drug Administration. Those concerns were so top of mind that it even led Pepsi to reformulate its diet soda last year. Beverage Digest did report there were a few notable "winners." Sprite and Fanta, both brands owned by Coke, reported volume gains of 3.3% and 8.3%, respectively. Sprite generated headlines with the launch of cans featuring inspiration quotes from hip-hop artists. That evoked another Coke-backed campaign, the "Share a Coke" campaign that helped jolt sales in 2014. Another beverage category that soared in 2015 was bottled water, which is counted in the broader "liquid refreshment beverages" channel. Dasani, Aquafina and Poland Spring reported volume increases ranging from 6.5% to 11.4%. The growth for Aquafina was so strong that it helped lift the brand back to the top 10 "Megabrand" list. It ranked ninth last year, pushing Arizona off the list. (Fortune, 2017)

1.6 Different Types of Soft Drinks

1.6.1 Pasteurizing noncarbonated beverages

Noncarbonated beverages require ingredients and techniques similar to those for carbonated beverages. However, since they lack the protection against spoilage afforded by carbonation, these are usually pasteurized, either in bulk, by continuous flash pasteurization prior to filling, or in the bottle.

1.6.2 Powdered soft drinks

These are made by blending the flavouring material with dry acids, gums, artificial colour, etc. If the sweetener has been included, the consumer need only add the proper amount of plain or carbonated water.

1.6.3 Iced soft drinks

The first iced soft drink consisted of a cup of ice covered with a flavoured syrup. Sophisticated dispensing machines now blend measured quantities of syrup with carbonated or plain water to make the finished beverage. To obtain the soft ice, or slush, the machine reduces the beverage temperature to between −5 and −2 °C (22 and 28 °F). (Encyclopedia Britannica, 2017)

1.7 Reasons Why People Drink Soft Drink

1.7.1 Soft drinks are very tasty

The taste could be the thing that gets people addicted to drinking soft drinks because it is delicious. In fact, soda is so good, that many people drink it with every meal! (Emedexpert.com, 2017)

1.7.2 Soft drinks are available everywhere

Even if you wanted to drink something else, you would be hard-pressed to find it as prominently displayed in vending machines, at fast-food chains, and supermarket checkouts.

You might not realize how ubiquitous Coke, Pepsi, and the like are in our society until you try to stop drinking soda. (Emedexpert.com, 2017)

1.7.3 Soft drinks are more convenience

The other addictive thing about soda is the convenience. If you are in rush hour most of us almost always are - it is so easy to grab a can and convenient to drink. (Emedexpert.com, 2017)

1.7.4 Promotion and Advertising

Soft drinks are heavily consumed in part because they are vigorously promoted - Billions of dollars are spend on advertising sodas and market them everywhere - in stores, restaurants, gas stations, museums, and even schools. (Emedexpert.com, 2017)

1.7.5 Habit of consuming soft drinks

For some people, drinking several sodas a day is a force of habit. You know drinking soda is a habit when you find yourself going to the grocery store at 10 p.m. because your refrigerator is tapped out. (Emedexpert.com, 2017)

1.7.6 It Is Cheap

Soda may be pretty inexpensive when compared with fruit juice and milk. With combo meals, a large soda is only an extra dollar, and you get fries! (Emedexpert.com, 2017)

1.7.7 Thirst

Often people drink soda to quench the thirst. However, this is probably the worst time to drink soda, because when you are very thirsty or dehydrated you have low levels of saliva. And saliva helps to neutralize acids (soda is the most acidic beverage you can buy, actually) and wash your teeth clean. (Emedexpert.com, 2017)

1.7.8 Caffeine Addiction

Many soft drinks contain caffeine which is mildly addictive. This fact is part of the reason why soda is such a hard habit to break. If you're addicted to the caffeine in soda, you're really having two habits - the soda habit and the caffeine habit. (Emedexpert.com, 2017)

1.8 Complication of Consuming Soft Drinks & Reasons to Stop Drinking Soft Drinks

1.8.1 Soda Is Useless

First of all, there are no nutritionally beneficial components in soft drinks. They mostly consist of filtered water and refined sugars. Yet the average American drinks about 41 gallons of soft drinks each year. (Emedexpert.com, 2017)

1.8.2 Weight Gain & Obesity

Many people either forget or don't realize how many extra calories they consume in what they drink. Drinking a single 330 ml can a day of sugary drinks translates to more than 1lb of weight gain every month. (Emedexpert.com, 2017)

Dr. Frank Hu, Professor of Nutrition and Epidemiology at Harvard School of Public Health, recently made a strong case that there is sufficient scientific evidence that decreasing sugar-sweetened beverage consumption will reduce the prevalence of obesity and obesity-related diseases. (The Nutrition Source, 2017)

Several scientific studies have provided experimental evidence that soft drinks are directly related to weight gain. The relationship between soft drink consumption and body weight is so strong that researchers calculate that for each additional soda consumed, the risk of obesity increases 1.6 times. And not only that, intake of sugar-sweetened beverages is strongly associated with accumulation of fat around the abdominal area. On the other hand, according to the results of high quality study, reducing consumption of sugar-sweetened beverages helped reduce body mass index in the heaviest teenagers. (Emedexpert.com, 2017)

1.8.3 Diabetes

People who consume soft drinks regularly—1 to 2 cans a day or more—have a 26% greater risk of developing type 2 diabetes than people who rarely have such drinks. Strong evidence indicates that sugar-sweetened soft drinks contribute to the development of diabetes. The Nurses' Health Study explored this connection by following the health of more than 90,000 women for eight years. The nurses who said they had one or more servings a day of a sugar-sweetened soft drink or fruit punch were twice as likely to have developed type 2 diabetes during the study than those who rarely had these beverages.

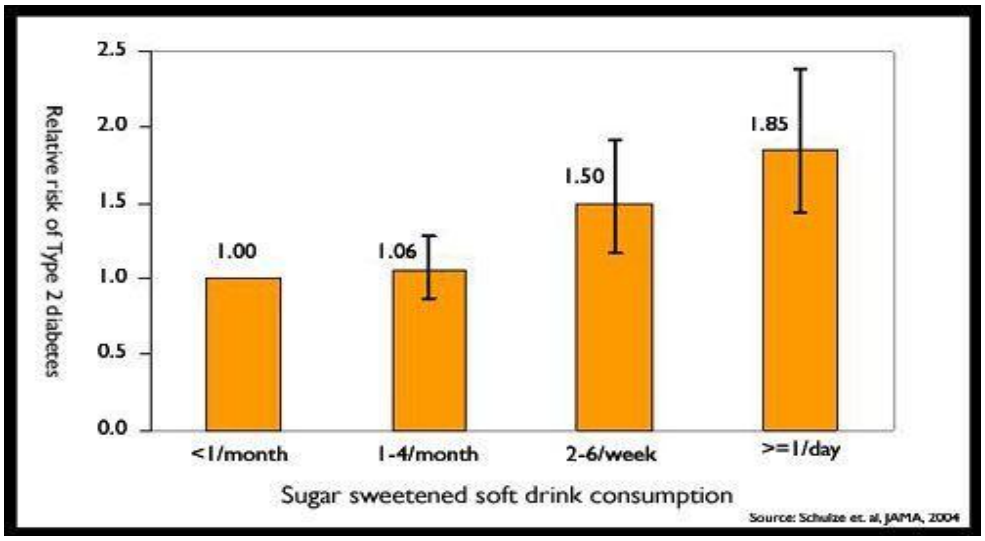

Fig 1.6: Relative risk of Type 2 diabetes per soft drinks consumption

A similar increase in risk of diabetes with increasing soft drink and fruit drink consumption was seen in the Black Women's Health Study, an ongoing long-term study of nearly 60,000 African-American women from all parts of the United States. Interestingly, the increased risk with soft drinks was tightly linked to increased weight. In the Framingham Heart Study, men and women who had one or more soft drinks a day were 25 percent more likely to have developed trouble managing blood sugar and nearly 50 percent more likely to have developed metabolic syndrome. (The Nutrition Source, 2017)

1.8.4 Weakened Bones and Risk of Osteoporosis

Frequent consumption of soft drinks may also increase the risk of osteoporosis, especially in people who substitute calcium-rich milk with soft drinks. High soft drinks consumption (particularly cola) in children poses a significant risk factor for impaired calcification of growing bones. In the 1950s, children drank 3 cups of milk for every 1 cup of sugary drinks. Today that ratio is reversed: 3 cups of sugary drinks for every cup of milk. Tellingly, osteoporosis is a major health threat for 44 million Americans. Most experts now say that the real culprit is soda's displacement of milk in the diet, though some scientists believe that the acidity of colas may be weakening bones by promoting the loss of calcium. (Emedexpert.com, 2017)

1.8.5 Soft drinks and heart disease

A study that followed 40,000 men for two decades found that those who averaged one can of a sugary beverage per day had a 20% higher risk of having a heart attack or dying from a heart attack than men who rarely consumed sugary drinks. A related study in women found a similar sugary beverage–heart disease link. The Nurses' Health Study, which tracked the health of nearly 90,000 women over two decades, found that women who drank more than two servings of sugary beverage each day had a 40 percent higher risk of heart attacks or death from heart disease than women who rarely drank sugary beverages. People who drink a lot of sugary drinks often tend to weigh more—and eat less healthfully—than people who don't drink sugary drinks, and the volunteers in the Nurses' Health Study were no exception. But researchers accounted for differences in diet quality, energy intake, and weight among the study volunteers. They found that having an otherwise healthy diet, or being at a healthy weight, only slightly diminished the risk associated with drinking sugary beverages.

This suggests that weighing too much, or simply eating too many calories, may only partly explain the relationship between sugary drinks and heart disease. Some risk may also be attributed to the metabolic effects of fructose from the sugar or HFCS used to sweeten these beverages.

The adverse effects of the high glycemic load from these beverages on blood glucose, cholesterol fractions, and inflammatory factors probably also contribute to the higher risk of heart disease. Read more about blood sugar and glycemic load. (The Nutrition Source, 2017)

1.8.6 Dental Caries and Erosion

Soft drinks eat up and dissolve the tooth enamel. Researchers say that soft drinks are responsible for doubling or tripling the incidence of tooth decay. The acidity can dissolve the mineral content of the enamel, making the teeth weaker, more sensitive, and more susceptible to decay. Soft drinks acidity makes it even worse for teeth than the solid sugar found in candy. Dental experts continue to urge that people drink less soda pop, especially between meals, to prevent tooth decay and dental erosion. (Emedexpert.com, 2017)

1.8.7 Kidney Damage

There is good evidence that specifically cola beverages can increase the risk of kidney problems, more so than non-cola sodas. Researches clearly demonstrated that large quantities of cola result in enhanced kidney stone formation. If you're wondering exactly how soft drinks cause kidney stones, it's because of their acidity and radical mineral imbalances. Your body must buffer the acidity of soft drinks with calcium from your own bones. As this calcium is eliminated through your urine, it slowly forms kidney stones. In a study published in the Epidemiology journal, the team compared the dietary habits of 465 people with chronic kidney disease and 467 healthy people. After controlling for various factors, the team found that drinking two or more colas a day (no matter if it was artificially sweetened or regular) was linked to a twofold risk of chronic kidney disease. (Emedexpert.com, 2017)

1.8.8 Increased Blood Pressure

Experts have reasons to believe that overconsumption of fructose, particularly in the form of soft drinks, leads to an increase in blood pressure. (Emedexpert.com, 2017)

1.8.9 Metabolic Syndrome Risk Factor

Soft drink regular drinking is a significant risk factor for developing of metabolic syndrome, a combination of the symptoms such as high blood pressure, obesity, high cholesterol, and insulin resistance. (Emedexpert.com, 2017)

1.8.10 Harmful Effects on Liver

There is evidence that consumption of too many soft drinks puts you under increased risk for liver cirrhosis - similar to what chronic alcoholics have. (Emedexpert.com, 2017)

1.8.11. Impaired Digestive System

Soft drinks are extremely acidic beverage, with a pH of about 2.5, about the same as vinegar, but the sugar content disguises the acidity. Throughout the digestive system, that starts from the mouth and ends up at the anus only the stomach can resist an acidic environment up to pH 2.0. But before the acidity of soft drink reaches the stomach it passes through the other organs that precede stomach in the digestive system thus causing an abnormal acidic environment. The linings of the mouth, pharynx and esophagus are highly sensitive to acids. The phosphoric acid (H_3PO_4) present in soft drink competes with the hydrochloric acid (HCl) of the stomach and affects its functions. When the stomach becomes ineffective, food remains undigested causing indigestion, gassiness or bloating (swelling of stomach). (Emedexpert.com, 2017)

1.8.12 Dehydration

The next problem with soft drinks is that they act as dehydrating diuretics. Both caffeine and sugar cause dehydration. Caffeine is a diuretic and causes an increase in urine volume. And high concentration of sugar is drawing off water as well because your kidneys try to expel the excess sugar out of the blood. When you drink a caffeinated soda to quench your thirst, you will actually become even thirstier. (Emedexpert.com, 2017)

1.8.13 High Caffeine Content

Avoiding soft drinks will also avoid the unnecessary caffeine. Soft drinks are a major source of caffeine in the American diet. High doses of caffeine can cause, among others, irritability, restlessness, tension, insomnia, high blood pressure, gastrointestinal disturbance, excessive urination, and irregular heartbeat. (Emedexpert.com, 2017)

1.8.14 Toxins - Aspartame

The poison in diet soda is an artificial sweetener aspartame. Aspartame is made up of three chemicals: aspartic acid, phenylalanine, and methanol. It is used because it's about 200 times sweeter than table sugar. Despite US FDA approval as a "safe" food additive, aspartame is one of the most dangerous substances added to foods. After drinking an aspartame-sweetened product, aspartame breaks down into its starting components: phenylalanine, aspartic acid, and methanol (that further converts to formaldehyde and formic acid, which are known carcinogens.). There are over 92 different health side effects associated with aspartame consumption. (Emedexpert.com, 2017)

1.8.15 Cell Damage

A new health scare erupted over soft drinks recently amid evidence that they may cause serious cell damage and accelerate cell aging. Research from a British university suggests a common preservative E211, known as sodium benzoate, found in drinks such as Fanta and Pepsi Max has the ability to switch off vital parts of DNA. Sodium benzoate occurs in small amounts naturally in berries, but is used in large quantities to prevent mould in soft drinks. (Emedexpert.com, 2017)

1.8.16 Other Harmful Effects

Consumption of soft drinks leads to increased risk of asthma and lung disease. Caffeinated and artificially sweetened soft drinks may increase the risk of early menarche, a risk factor of several diseases and elevation of uric acid levels, Risk of developing hypertension, mental health problems. (Emedexpert.com, 2017)

CHAPTER-2

LITERATURE REVIEW

2.1 Soft drinks and 'desire to drink' in preschoolers

Interest in soft drink consumption has increased following a dramatic rise in intake over recent years. Research to date has focused primarily on general trends in consumption or on understanding the mechanism by which soft drink consumption may be linked to weight gain. It is clear however that there is considerable individual variability in the extent to which soft drinks are consumed and factors potentially influencing intake have received little attention. This study examines how the Child Eating Behaviour Questionnaire (CEBQ) construct 'Desire to Drink' (DD) relates to drink consumption, preferences and BMI-SDS. Three hundred and forty six same-sex twin children (mean age 11.2 years; s.d. 0.54; 56% female; 53% dizygotic) were weighed, measured and reported their liking for milk, water, fruit juice, fruit squash and sweetened soft drinks. Mothers reported on their child's drink consumption and completed the CEBQ. Scores on the CEBQ DD subscale were not significantly related to child BMI-SDS in this sample. Children scoring higher on DD had higher preferences for sugar-sweetened soft drinks ($p = 0.016$), fruit squash ($p = 0.042$) and milk ($p = 0.020$) than children scoring lower on the scale. DD was also positively related to more frequent consumption of sugar-sweetened soft drinks ($p = 0.017$) and low calorie soft drinks ($p = 0.003$). No relationship was observed between DD scores and liking for or intake of water or 100% fruit juice. These findings suggest that the construct desire to drink in children is related to a liking for consuming sweetened drinks, and does not appear to simply denote greater thirst or hunger. This may have important implications for the ongoing development of dietary patterns and weight status in the longer term through an increased preference for sweet things in the mouth and a failure to compensate for calories provided by drinks. (Sweetman, Wardle and Cooke, 2017)

2.2 Understanding soft drink consumption among female adolescents using the Theory of Planned Behavior.

This study identified factors that influence regular soda consumption among 707 female students, aged 13–18 years, attending North Los Angeles County public high schools. Participants completed a group-administered Theory of Planned Behavior-based

questionnaire. Almost all of the participants, 96.3%, reported that they currently drink soda; 50.1% reported drinking 2 glasses of soda or more per day during the past year. Students reported drinking regular soda more than diet soda and reported drinking phosphoric acid-containing soda more than non-phosphoric acid-containing soda. Attitude, subjective norm and perceived behavioral control had statistically significant positive associations with intention, and were each significant predictors of intention to drink regular soda and together explained 64% of its variance. The strongest predictor was attitude, followed by perceived behavioral control and subjective norm. Our results suggest that efforts to reduce soda consumption among female adolescents should include parents and friends. It is also important that soda should not be excessively available at home or widely accessible to teenagers at schools. Healthy eating messages for adolescents need to be developed and incorporated into existing and future campaigns to reinforce the perception that there are other healthier drinks that quench thirst and that taste good as well. (Nada O. Kassem and Jerry W. Lee, 2017)

2.3 Effects of Soft Drink Consumption on Nutrition and Health: A Systematic Review and Meta-Analysis

In a meta-analysis of 88 studies, we examined the association between soft drink consumption and nutrition and health outcomes. We found clear associations of soft drink intake with increased energy intake and body weight. Soft drink intake also was associated with lower intakes of milk, calcium, and other nutrients and with an increased risk of several medical problems (e.g., diabetes). Study design significantly influenced results: larger effect sizes were observed in studies with stronger methods (longitudinal and experimental vs. cross-sectional studies). Several other factors also moderated effect sizes (e.g., gender, age, beverage type). Finally, studies funded by the food industry reported significantly smaller effects than did non–industry-funded studies. Recommendations to reduce population soft drink consumption are strongly supported by the available science. (Lenny R. Vartanian, ,Marlene B. Schwartz and Kelly D. Brownell, 2017)

2.4 Intake of sugar-sweetened beverages and weight gain: a systematic review1, 2, 3

Consumption of sugar-sweetened beverages (SSBs), particularly carbonated soft drinks, may be a key contributor to the epidemic of overweight and obesity, by virtue of these beverages' high added sugar content, low satiety, and incomplete compensation for total energy. Whether an association exists between SSB intake and weight gain is unclear. We searched English-language MEDLINE publications from 1966 through May 2005 for cross-sectional, prospective cohort and experimental studies of the relation between SSBs and the risk of weight gain (i.e., overweight, obesity, or both). Thirty publications (15 cross-sectional, 10 prospective, and 5 experimental) were selected on the basis of relevance and quality of design and methods. Findings from large cross-sectional studies, in conjunction with those from well-powered prospective cohort studies with long periods of follow-up, show a positive association between greater intakes of SSBs and weight gain and obesity in both children and adults. Findings from short-term feeding trials in adults also support an induction of positive energy balance and weight gain by intake of sugar-sweetened sodas, but these trials are few. A school-based intervention found significantly less soft-drink consumption and prevalence of obese and overweight children in the intervention group than in control subjects after 12 month and a recent 25-week randomized controlled trial in adolescents found further evidence linking SSB intake to body weight. The weight of epidemiologic and experimental evidence indicates that a greater consumption of SSBs is associated with weight gain and obesity. Although more research is needed, sufficient evidence exists for public health strategies to discourage consumption of sugary drinks as part of a healthy lifestyle. (Vasanti S Malik, Matthias B Schulze and Frank B Hu, 2017)

2.5 Soft Drink Consumption and Risk of Developing Cardiometabolic Risk Factors and the Metabolic Syndrome in Middle-Aged Adults in the Community.

Consumption of soft drinks has been linked to obesity in children and adolescents, but it is unclear whether it increases metabolic risk in middle-aged individuals. We related the

incidence of metabolic syndrome and its components to soft drink consumption in participants in the Framingham Heart Study (6039 person-observations, 3470 in women; mean age 52.9 years) who were free of baseline metabolic syndrome. Metabolic syndrome was defined as the presence of ≥3 of the following: waist circumference ≥35 inches (women) or ≥40 inches (men); fasting blood glucose ≥100 mg/dL; serum triglycerides ≥150 mg/dL; blood pressure ≥135/85 mm Hg; and high-density lipoprotein cholesterol <40 mg/dL (men) or <50 mg/dL (women). Multivariable models included adjustments for age, sex, physical activity, smoking, dietary intake of saturated fat, trans fat, fiber, magnesium, total calories, and glycemic index. Cross-sectionally, individuals consuming ≥1 soft drink per day had a higher prevalence of metabolic syndrome (odds ratio [OR], 1.48; 95% CI, 1.30 to 1.69) than those consuming <1 drink per day. On follow-up (mean of 4 years), new-onset metabolic syndrome developed in 765 (18.7%) of 4095 participants consuming <1 drink per day and in 474 (22.6%) of 2059 persons consuming ≥1 soft drink per day. Consumption of ≥1 soft drink per day was associated with increased odds of developing metabolic syndrome (OR, 1.44; 95% CI, 1.20 to 1.74), obesity (OR, 1.31; 95% CI, 1.02 to 1.68), increased waist circumference (OR, 1.30; 95% CI, 1.09 to 1.56), impaired fasting glucose (OR, 1.25; 95% CI, 1.05 to 1.48), higher blood pressure (OR, 1.18; 95% CI, 0.96 to 1.44), hypertriglyceridemia (OR, 1.25; 95% CI, 1.04 to 1.51), and low high-density lipoprotein cholesterol (OR, 1.32; 95% CI 1.06 to 1.64). In middle-aged adults, soft drink consumption is associated with a higher prevalence and incidence of multiple metabolic risk factors. (Dhingra, Sullivan and Jacques, 2017)

2.6 Factors associated with soft drink consumption in school-aged children.

To identify factors associated with nonalcoholic carbonated beverage (soft drink) consumption in children. Mail-in surveys collected by Dragonfly, a children's educational magazine distributed nationally to elementary and middle schools, were analyzed. The survey included questions about frequency of soft drink consumption and factors related to soft drink consumption. The sample consisted of 560 children, 8 to 13 years old, who completed and mailed in the survey. There was an equal distribution of boys and girls (51% and 49%, respectively). Preference for the taste of soft drinks was the strongest predictor in

the analysis, with those who reported the strongest taste preference 4.50 times more likely (95% confidence interval=2.89–7.04) to consume soft drinks five or more times per week than those with a lower taste preference. Youth whose parents regularly drank soft drinks were 2.88 times more likely (95% confidence interval=1.76–4.72) to consume soft drinks five or more times per week compared with those whose parents did not regularly drink soft drinks. Results suggest that several factors may be associated with soft drink intake in school-aged children, most notably taste preferences, soft drink consumption habits of parents and friends, soft drink availability in the home and school, and television viewing. Additional research is needed to verify these findings in a representative sample of children. (Grimm, Harnack and Story, 2017)

2.7 Carbonated Soft Drink Consumption and Bone Mineral Density in Adolescence: The Northern Ireland Young Hearts Project.

In an observational study of 1335 boys and girls aged 12 and 15 years, higher intakes of carbonated soft drinks (CSDs) were significantly associated with lower bone mineral density at the heel, but only in girls. Owing to the upward trend in CSD intake in adolescence, this finding may be of concern. High consumption of carbonated soft drinks (CSD) during adolescence may reduce bone mineral accrual and increase fracture risk. The aim of this study was to examine the relationship between CSD consumption and bone mineral density (BMD) in a representative sample of adolescents. This was a cross-sectional observational study in 36 post primary schools in Northern Ireland. Participants included 591 boys and 744 girls either 12 or 15 years old. BMD was measured by DXA, and usual beverage consumption was assessed by the diet history method. Adjusted regression modeling was used to investigate the influence of CSD on BMD. A significant inverse relationship between total CSD intake and BMD was observed in girls at the dominant heel (β, −0.099; 95% CI, −0.173 to −0.025). Non-cola consumption was inversely associated with dominant heel BMD in girls (β, −0.121; 95% CI, −0.194 to −0.048), and diet drinks were also inversely associated with heel BMD in girls (β, −0.087; 95% CI, −0.158 to −0.016). However, no consistent relationships were observed between CSD intake and BMD in boys. Cola consumption and

nondiet drinks were not significantly related to BMD in either sex. CSD consumption seems to be inversely related to BMD at the dominant heel in girls. It is possible that the apparent association results from the displacement of more nutritious beverages from the diet. Although the inverse association observed between CSD consumption and BMD is modest and confined to girls, this finding may have important public health implications given the widespread use and current upward trend in CSD consumption in Western populations. (McGartland et al., 2017)

2.8 Soft Drink Consumption Linked with Fatty Liver in the Absence of Traditional Risk Factors.

Little is known about dietary habits and their relationships with liver disease in nonalcoholic fatty liver disease (NAFLD) patients, particularly in the absence of obesity, diabetes or hyperlipidemia. To assess the association between soft drink consumption and the presence of fatty liver in NAFLD patients who do not have classic risk factors. Three hundred ten patients with NAFLD diagnosed by ultrasound were assessed for 36 months in a cross-sectional manner. Thirty-one patients (10%) who had NAFLD without classic risk factors were compared with 30 healthy controls. Physical activity was assessed during the preceding week and year, and every six months for 36 months. Data on daily dietary intake of food and soft drink, and the source of added sugar were collected during two seven-day periods, at the beginning of the study, and within two weeks after the metabolic tests by using a validated food questionnaire given by a trained dietician. Insulin resistance and lipid peroxidation were assessed by homeostasis model assessment-insulin resistance index (HOMA-IRI) and malondialdehyde (MDA) levels, respectively. Eighty per cent of patients (25 of 31) consumed an excessive amount of soft drink beverages (more than 50 g/day of added sugar) for 36 months, compared with 20% in healthy controls ($P<0.001$). Twenty per cent of patients consumed one drink per day, 40% consumed two to three drinks per day, and 40% consumed more than four drinks per day for most days during 36 months. The most common soft drinks consumed were regular Coca-Cola (40% of patients), Diet Coke (40%) and flavoured fruit juices (20%). Ultrasound findings revealed mild fatty liver in 44% of cases (n=14), moderate fatty liver in 38% (n=12), and severe fatty liver in 18% (n=5). HOMA-IRI

and MDA levels were significantly higher in patients with NAFLD than in healthy controls (HOMA-IRI, 3.7 versus 1.7, P<0.001; and MDA, 420±300 μmol/mL versus 200±100 μmol/mL; P<0.001). When controlled for other factors, including dietary composition and physical activity, soft drink beverage consumption was the only independent variable that was able to predict the presence of fatty liver in 82.5% of cases with a sensitivity of 100%, a specificity of 76%, a positive predictive value of 57% and a negative predictive value of 100%.The present study may add important insight into the role of sugar-sweetened beverage consumption as a cause of fatty liver in patients without risk factors. Patients are encouraged to change their long-standing drinking behaviour. (Assy et al., 2017)

2.9 Relationship of Soft Drink Consumption to Global Overweight, Obesity, and Diabetes: A Cross-National Analysis of 75 Countries.

We estimated the relationship between soft drink consumption and obesity and diabetes worldwide. We used multivariate linear regression to estimate the association between soft drink consumption and overweight, obesity, and diabetes prevalence in 75 countries, controlling for other foods (cereals, meats, fruits and vegetables, oils, and total calories), income, urbanization, and aging. Data were obtained from the Euromonitor Global Market Information Database, the World Health Organization, and the International Diabetes Federation. Bottled water consumption, which increased with per-capita income in parallel to soft drink consumption, served as a natural control group. Soft drink consumption increased globally from 9.5 gallons per person per year in 1997 to 11.4 gallons in 2010. A 1% rise in soft drink consumption was associated with an additional 4.8 overweight adults per 100 (adjusted B; 95% confidence interval [CI] = 3.1, 6.5), 2.3 obese adults per 100 (95% CI = 1.1, 3.5), and 0.3 adults with diabetes per 100 (95% CI = 0.1, 0.8). These findings remained robust in low- and middle-income countries. Soft drink consumption is significantly linked to overweight, obesity, and diabetes worldwide, including in low- and middle-income countries. (Sanjay Basu, Martin McKee and Gauden Galea, 2017)

2.10 Sugary drink consumption and dental caries in New South Wales teenagers.

The consumption of water, milk and various sugary drinks and their relationship with the caries experience of a random sample of teenagers aged 14 to 15 years living in New South Wales, Australia was investigated. Data were obtained from both clinical and questionnaire components of the NSW Teen Dental Survey, 2010. The analyses allowed for various demographic and behavioural risk factors using caries experience (DMFT >0) and mean DMFT as the key outcome variables. Males were more likely than females to consume large volumes of sugary drinks. Consuming two or more glasses of sugary drinks per day led to significantly increased caries experience amongst this sample of 14 and 15 year olds. Factors found to be associated with elevated sugary drink consumption included family income, gender, and mother's education level. There is a strong correlation between increased caries experience of NSW teenagers and high levels of consumption of sugary drinks. (Skinner, Byun and Blinkhorn, 2017)

2.11 Soft drink consumption and urinary stone recurrence: A randomized prevention trial.

The object of this study was to determine if a strong association between soft drink (soda) consumption and recurrence of urinary stone disease, found in an earlier case-control study of adult males, had a causal component. The study sample consisted of 1009 male subjects, who completed an episode of urinary stone disease, who were aged 18–75 at that time, and who reported consuming at least 160 ml per day of soft drinks. Half of the subjects were randomized to refrain from consuming soft drinks, while the remaining subjects served as controls. The intervention group had an observed 6.4% advantage in actuarial 3 yr freedom from recurrence ($p = 0.023$ one-sided) over the control group. One important secondary finding was that for those who reported at the time of the index stone that their most consumed drink was acidified by phosphoric acid but not citric acid, the experimental group had a 15% higher 3 yr recurrence-free rate than the controls, $p = 0.002$, while for those who reported at the time of the index stone that their most consumed drink was acidified by citric

acid with or without phosphoric acid, the experimental group had a similar 3 yr recurrence-free rate to the controls, p = 0.55. This interaction was significant, p = 0.019. (SHUSTER and Logan, 2017)

2.12 Patterns of soft drink consumption and primary tooth extractions in Queensland children.

The authors examined the association of patterns of soft drink consumption and primary tooth extractions in Queensland children aged 12 years or less. Data were gathered through the Child Health Surveys conducted by Queensland Health in 2003 and 2008. The analysis allowed for various demographic characteristics using logistic regression analysis. The data in both surveys showed an increased risk of tooth extraction in children who had a greater frequency and amount of soft drink consumption, and those that consumed soft drink between meals. In 2008, the percentage of children that had soft drink daily or several times a week had decreased, with an increase in those that never had soft drink. To reduce the risk of primary tooth extraction due to decay, this paper recommends the continuing moderation of soft drink consumption frequency and the consumption of soft drinks with, rather than between, meals. (Slater et al., 2017)

2.13 Risk Indicators for Tooth Loss due to Caries and Periodontal Disease in Recipients of Free Dental Treatment in an Adult Population in Bangladesh.

The aims of this study were first to identify the risk indicators for permanent tooth extraction in patients who were receiving free dental treatment, and second to determine whether or not the reasons for tooth extraction are related to socio-demographic factors. Materials and Methods: Bangladeshi adults who visited Dhaka Dental College Hospital participated in this study. For each extraction, the clinician recorded age, sex, educational status, type of tooth extracted, dietary habits, oral hygiene, history of smoking and betel quid chewing and reasons for tooth extraction. A series of bivariate analyses and logistic regression analyses were carried out to assess the effects of major variables. Results: A total of 868 teeth were extracted from 582 patients. Among them, 586 (67.5%) of the teeth were extracted due to

caries and its sequelae, 161 (18.5%) and 121 (13.9%) were extracted for periodontal and other reasons. Logistic regression analysis revealed that tooth extraction due to caries had significant associations with age (P = 0.0001), tooth type (P = 0.013), consumption of sweets, snacks and soft drinks (P = 0.0001 and P = 0.0001, respectively), frequency of teeth cleaning (P = 0.007) and dental attendance pattern (P = 0.004). For tooth extraction due to periodontal disease, associations with age (P = 0.001), educational level (P = 0.018), tooth type (P = 0.024), betel quid chewing (P = 0.0001), smoking habit (P = 0.032), method of teeth cleaning (P = 0.001) and the use of dentifrices (P = 0.024) were statistically significant. In this group of patients, caries and its sequelae were the most common reasons for extraction of teeth, followed by periodontal disease. Betel quid chewing, smoking and dietary and oral hygiene habits were also significant predictors of tooth loss. (Nur Mohammad Monsur, 2017)

2.14 Soft Drink Consumption among US Children and Adolescents.

To determine whether carbonated soft drink consumption is associated with consumption of milk, fruit juice, and the nutrients concentrated in these beverages.Data collected as part of the 1994 Continuing Survey of Food Intakes by Individuals were analyzed. Information on food and nutrient intake was derived from 2 days of dietary recall data collected via an in-person interview. Nationally representative sample of people of all ages residing in the United States (response rate=76.2%). Analyses were restricted to children aged 2 to 18 years (N=l,810).Statistical analyses performed Logistic regression analyses were conducted to predict the odds of low milk and juice consumption by soft drink consumption level. To determine whether intake of select nutrients varied by soft drink consumption, multiple linear regression modeling was conducted. Analyses were conducted using sample weights and software appropriate for the survey design. Energy intake was positively associated with consumption of nondiet soft drinks. For example, mean adjusted energy intake was 1,830 kcal/day for school-aged children who were nonconsumers of soft drinks compared with 2,018 kcal/day for children in this age group who consumed an average of 9 oz of soda or more per day. Those in the highest soft drink consumption category consumed less milk and fruit juice compared with those in the lowest consumption category

(nonconsumers).Nutrition education messages targeted to children and/or their parents should encourage limited consumption of soft drinks. Policies that limit children's access to soft drinks at day care centers and schools should be promoted. (Harnack, Stang and Story, 2017)

2.15 Determinants and patterns of soft drink consumption in young adults: a qualitative analysis.

To explore knowledge, attitudes and behaviours regarding caloric soft drinks in a group of young adults attending university and to identify opportunities for a health promotion intervention aimed at reducing consumption. In-depth, semi-structured focus groups segmented by gender. Undergraduate University of Sydney students aged 18–30 years (n 35).Social and environmental cues, intrinsic qualities of beverages and personal health beliefs were identified as important influences on consumption. Social cues included settings in which alcohol is usually consumed, socializing with friends, and family influences. Environmental cues included purchasing of fast foods, and ready availability, preferential pricing and promotion of caloric beverages. Reinforcing intrinsic qualities of caloric soft drinks included taste, sugar and caffeine content, and their association with treats and rewards. Major gender differences as well as variations in individual readiness for behaviour change were observed. Raising awareness of the sugar content of various beverages and the potential health impacts associated with their consumption was considered important.The findings provide new insights with important implications for policy and practice, and suggest that there is considerable scope for promoting awareness in this group. Carefully designed social marketing campaigns highlighting the health issues and addressing social and environmental cues relating to caloric soft drink consumption are required. There is a need for gender-differentiated intervention programmers which are both informational and appealing to young adults. Further research is warranted, particularly to investigate beverage consumption relating to fast-food meal deals and young adults' consumption patterns in more depth. (Hattersley et al., 2017)

2.16 Soft drinks, fructose consumption, and the risk of gout in men: prospective cohort study.

To examine the relation between intakes of sugar sweetened soft drinks and fructose and the risk of incident gout in men. Design Prospective cohort over 12 years. Setting health professionals follow-up study. 46 393 men with no history of gout at baseline who provided information on intake of soft drinks and fructose through validated food frequency questionnaires. Main outcome measure Incident cases of gout meeting the American College of Rheumatology survey criteria for gout. During the 12 years of follow-up 755 confirmed incident cases of gout were reported. Increasing intake of sugar sweetened soft drinks was associated with an increasing risk of gout. Compared with consumption of less than one serving of sugar sweetened soft drinks a month the multivariate relative risk of gout for 5-6 servings a week was 1.29 (95% confidence interval 1.00 to 1.68), for one serving a day was 1.45 (1.02 to 2.08), and for two or more servings a day was 1.85 (1.08 to 3.16; P for trend=0.002). Diet soft drinks were not associated with risk of gout (P for trend=0.99). The multivariate relative risk of gout according to increasing fifths of fructose intake were 1.00, 1.29, 1.41, 1.84, and 2.02 (1.49 to 2.75; P for trend <0.001). Other major contributors to fructose intake such as total fruit juice or fructose rich fruits (apples and oranges) were also associated with a higher risk of gout (P values for trend <0.05). Prospective data suggest that consumption of sugar sweetened soft drinks and fructose is strongly associated with an increased risk of gout in men. Furthermore, fructose rich fruits and fruit juices may also increase the risk. Diet soft drinks were not associated with the risk of gout. (Choi and Curhan, 2017)

2.17 Enamel Erosion by Some Soft Drinks and Orange Juices Relative to Their pH, Buffering Effect and Contents of Calcium Phosphate.

The capability of a soft drink or a juice to erode dental enamel depends not only on the pH of the drink, but also on its buffering effect. As the latter is the ability of the drink to resist a change of pH it may add to the effects of the actual pH. The aim of the present study was to compare the pH and the buffering effect of various soft drinks with their erosive effects and the solubility of apatite. In 18 soft drinks, mineral waters and juices available on the Danish

market, pH and the concentrations of calcium, phosphate and fluoride were determined. The buffering effect was determined by titration with NaOH. Human teeth (n = 54) covered with nail varnish except for 3×4–mm windows were exposed to 1.5 liters of the drink for either 7 days or 24 h under constant agitation. The depth of the erosions was assessed in longitudinal sections. The depth was found to vary greatly from 3 mm eroded by the most acidic drinks and fresh orange juice to only slightly affected surfaces by most of the mineral waters. The dissolution of enamel increased logarithmically inversely with the pH of the drink and parallel with the solubility of enamel apatite. Orange juice, pH 4.0, supplemented with 40 mmol/l calcium and 30 mmol/l phosphate did not erode the enamel as the calcium and phosphate saturated the drink with respect to apatite. Generally, the lower the pH the more NaOH was necessary to bring the pH to neutrality. In particular the buffering effect of the juice was high. For all drinks, no effect of their low fluoride concentrations was observed. (Larsen and Nyvad, 2017)

2.18 Dietary Sugars Intake and Cardiovascular Health: A Scientific Statement From the American Heart Association

High intakes of dietary sugars in the setting of a worldwide pandemic of obesity and cardiovascular disease have heightened concerns about the adverse effects of excessive consumption of sugars. In 2001 to 2004, the usual intake of added sugars for Americans was 22.2 teaspoons per day (355 calories per day). Between 1970 and 2005, average annual availability of sugars/added sugars increased by 19%, which added 76 calories to Americans' average daily energy intake. Soft drinks and other sugar-sweetened beverages are the primary source of added sugars in Americans' diets. Excessive consumption of sugars has been linked with several metabolic abnormalities and adverse health conditions, as well as shortfalls of essential nutrients. Although trial data are limited, evidence from observational studies indicates that a higher intake of soft drinks is associated with greater energy intake, higher body weight, and lower intake of essential nutrients. National survey data also indicate that excessive consumption of added sugars is contributing to overconsumption of discretionary calories by Americans. On the basis of the 2005 US Dietary Guidelines, intake of added sugars greatly exceeds discretionary calorie allowances, regardless of energy needs. In view

of these considerations, the American Heart Association recommends reductions in the intake of added sugars. A prudent upper limit of intake is half of the discretionary calorie allowance, which for most American women is no more than 100 calories per day and for most American men is no more than 150 calories per day from added sugars. (Johnson, Appel and Brands, 2017)

2.19 Intake of sugar-sweetened beverages and weight gain: a systematic review.

Consumption of sugar-sweetened beverages (SSBs), particularly carbonated soft drinks, may be a key contributor to the epidemic of overweight and obesity, by virtue of these beverages' high added sugar content, low satiety, and incomplete compensation for total energy. Whether an association exists between SSB intake and weight gain is unclear. We searched English-language MEDLINE publications from 1966 through May 2005 for cross-sectional, prospective cohort, and experimental studies of the relation between SSBs and the risk of weight gain (ie, overweight, obesity, or both). Thirty publications (15 cross-sectional, 10 prospective, and 5 experimental) were selected on the basis of relevance and quality of design and methods. Findings from large cross-sectional studies, in conjunction with those from well-powered prospective cohort studies with long periods of follow-up, show a positive association between greater intakes of SSBs and weight gain and obesity in both children and adults. Findings from short-term feeding trials in adults also support an induction of positive energy balance and weight gain by intake of sugar-sweetened sodas, but these trials are few. A school-based intervention found significantly less soft-drink consumption and prevalence of obese and overweight children in the intervention group than in control subjects after 12 mo, and a recent 25-week randomized controlled trial in adolescents found further evidence linking SSB intake to body weight. The weight of epidemiologic and experimental evidence indicates that a greater consumption of SSBs is associated with weight gain and obesity. Although more research is needed, sufficient evidence exists for public health strategies to discourage consumption of sugary drinks as part of a healthy lifestyle. (Malik, Schulze and Hu, 2017)

2.20 Consumption of Sweetened Beverages and Intakes of Fructose and Glucose Predict Type 2 Diabetes Occurrence.

The role of intakes of different sugars in the development of type 2 diabetes was studied in a cohort of 4,304 men and women aged 40–60 y and initially free of diabetes at baseline in 1967–1972. Food consumption data were collected using a dietary history interview covering the habitual diet during the previous year. The intakes of different sugars were calculated and divided in quartiles. During a 12-y follow-up, 177 incidents of type 2 diabetes cases were identified from a nationwide register. Combined intake of fructose and glucose was associated with the risk of type 2 diabetes but no significant association was observed for intakes of sucrose, lactose, or maltose. The relative risk between the highest and lowest quartiles of combined fructose and glucose intake was 1.87 (95% [CI] = 1.19, 2.93; P = 0.003). The corresponding relative risks between the extreme quartiles of consumption of food items contributing to sugar intakes were 1.69 (95% [CI] = 1.17, 2.43; P < 0.001) for sweetened berry juice and 1.67 (95% [CI] = 0.98, 2.87; P= 0.01) for soft drinks. Our findings support the view that higher intake of fructose and glucose and sweetened beverages may increase type 2 diabetes risk. (Montonen, Järvinen and Knekt, 2017)

CHAPTER-3

MATERIALS AND METHOD

3.1 Type of the Study

It was a survey-based study.

3.2 Materials

- Survey questionnaire
- Response from the respondents
- BMI Calculator

3.3 Study Area

The survey was conducted on students of different departments of East West University.

3.4.1 Inclusion Criteria

- Both males and females
- Anyone who was a student of East west University

3.4.2 Exclusion Criteria

- Person unwilling to do the study
- Anyone who was not student

3.5 Study Population

In this study, both male and female were the study population. This inquiry was carried out on 445 students of East West University.

3.6 Development of the Questionnaire

Following the STEPS guideline the questionnaire was developed. Also from the observation of different behavior of students.

3.7 Sampling Technique

In this study random sampling technique was followed.

A Survey on Soft Drinks Intake Behaviour among University Going Students

3.8 Data Collection Method

The data was collected through questionnaire that is formed in English language. It is a questionnaire consists of multiple choice type questions. The data was collected by both face-to-face interview and by questionnaire supply.

3.9 Data Analysis

After collecting, all the data were checked and analyzed with the help of Microsoft Excel 2013.

3.10 BMI Parameter

BMI Classification	BMI
Underweight	<16-18.5
Normal	18.5-25
Overweight	25-30
Obese	30-40

BMI Classification

3.11 Procedure

The study was performed through 3 stages of the procedure. In the beginning literaturereview was done from 20 online literature regarding Breakfast Habit and Skipping Breakfast Among University Going Students. The aim ofliterature review was to observe the breakfast habit of both male and female students. Followed by theliterature review data collection step was executed by collecting data with the help of asurvey questionnaire. In the final stage data analysis was made with the help of Microsoft Excel 2013.

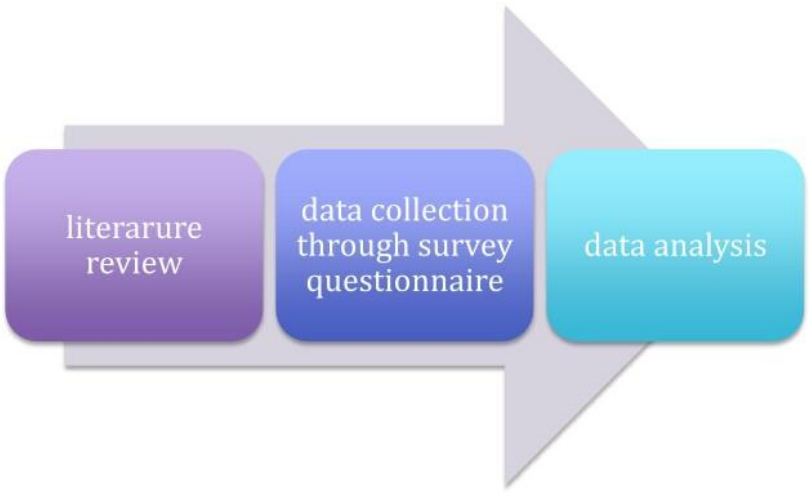

Fig 3.1: Procedure

CHAPTER-4

RESULT & ANALYSIS

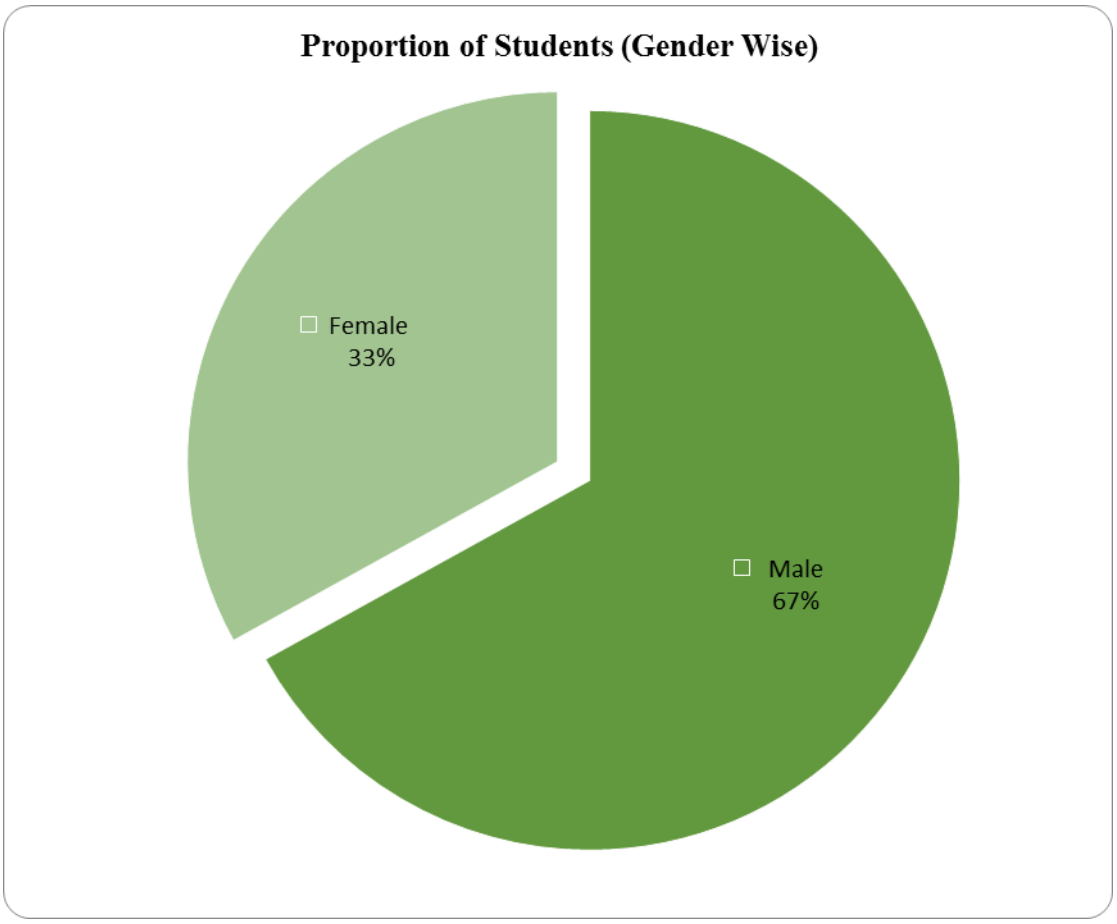

Fig 4.1: Proportion of students (gender wise).

The survey was conducted on 445 students. Among them 33% were female and 67% were male.

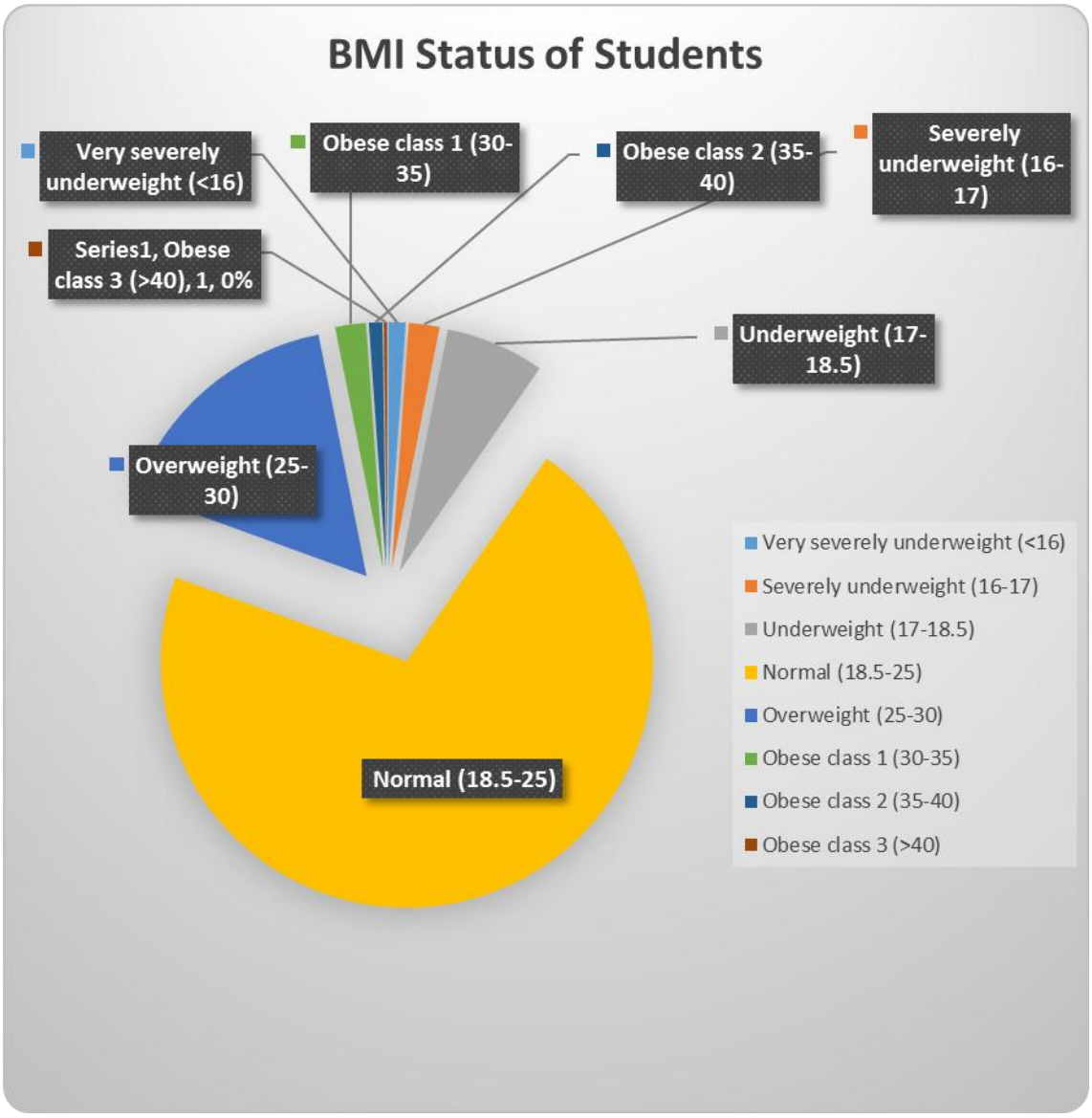

Fig 4.2: BMI status of students.

Among 445 students, 1% were very severely underweight, 2% were severely underweight, 7% underweight, 71% healthy weight, 16% overweight, 2% were obese (class I) and 1% were obese (class II).

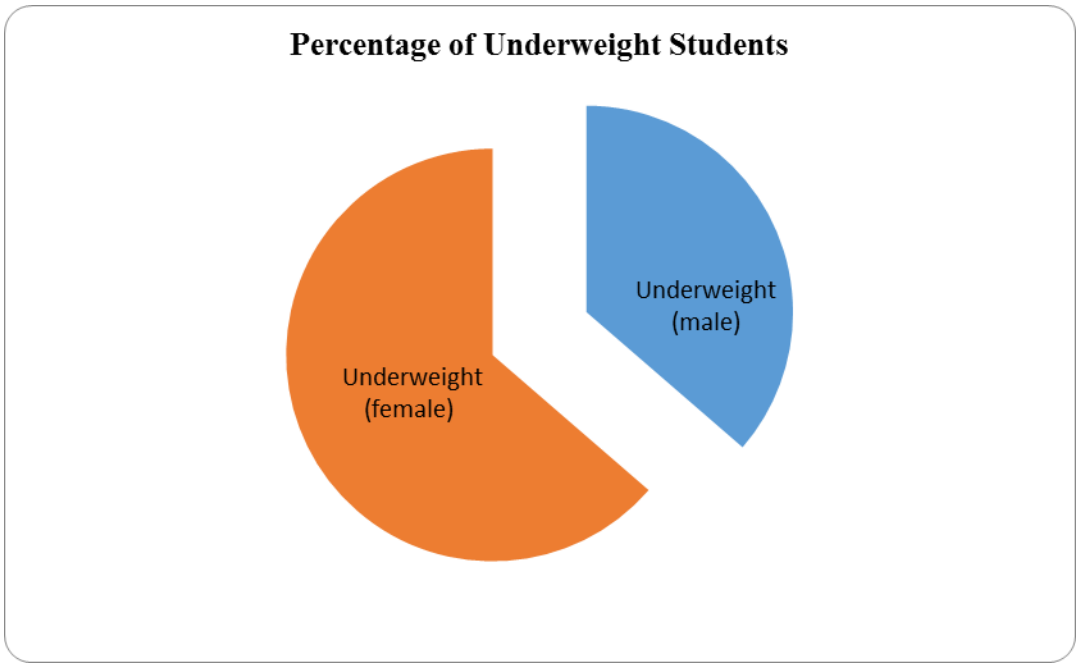

Fig 4.3: Percentage of Underweight Students.

In this study some severely underweight underweight students were found. Among them 64% were female and 36% were male.

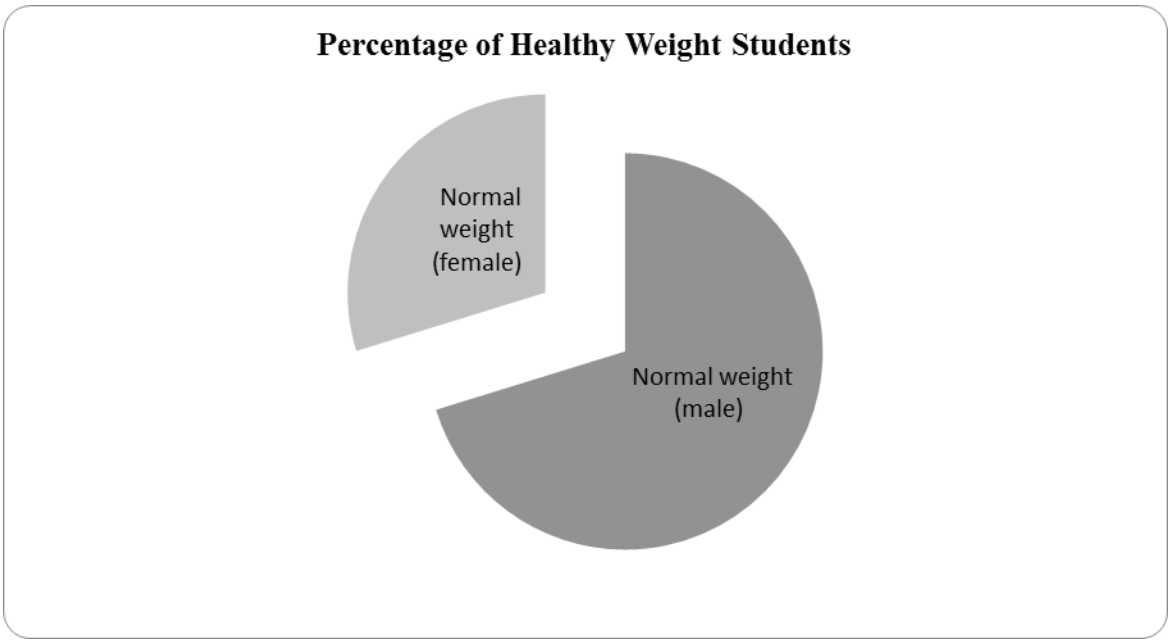

Fig 4.4: Percentage of Healthy Weight Students.

In this study 289 very severely underweight students were found. Among of them 30% were female and 70% were male.

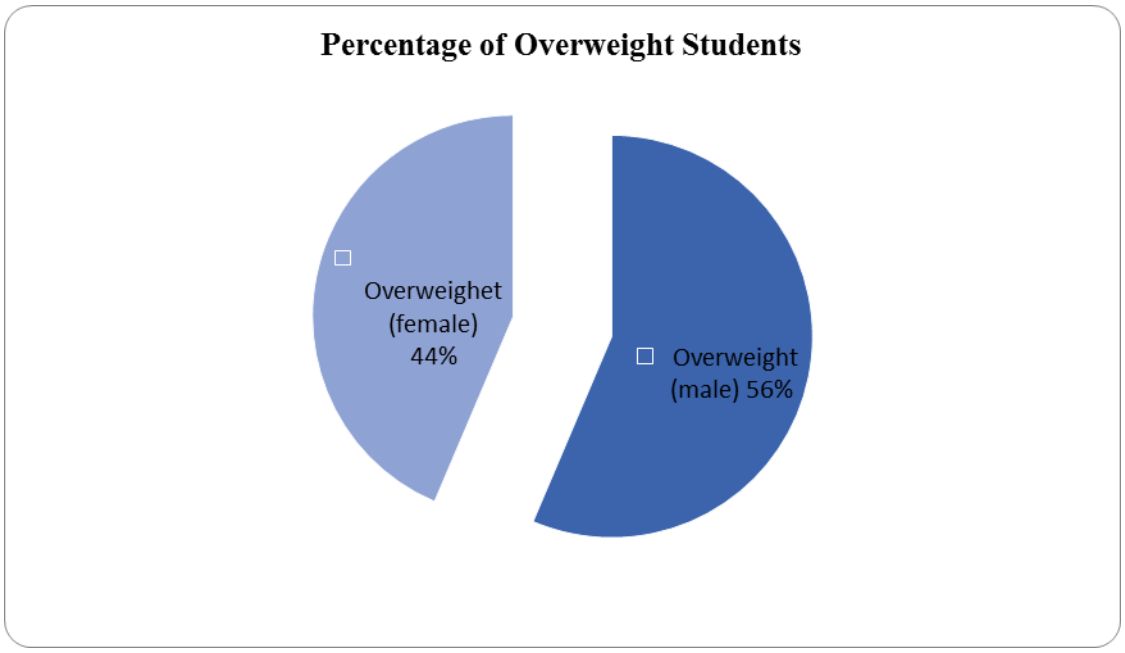

Fig 4.5: Percentage of overweight students.

In this study 49 overweight students were found. Among of them 44% were female and 56% were male.

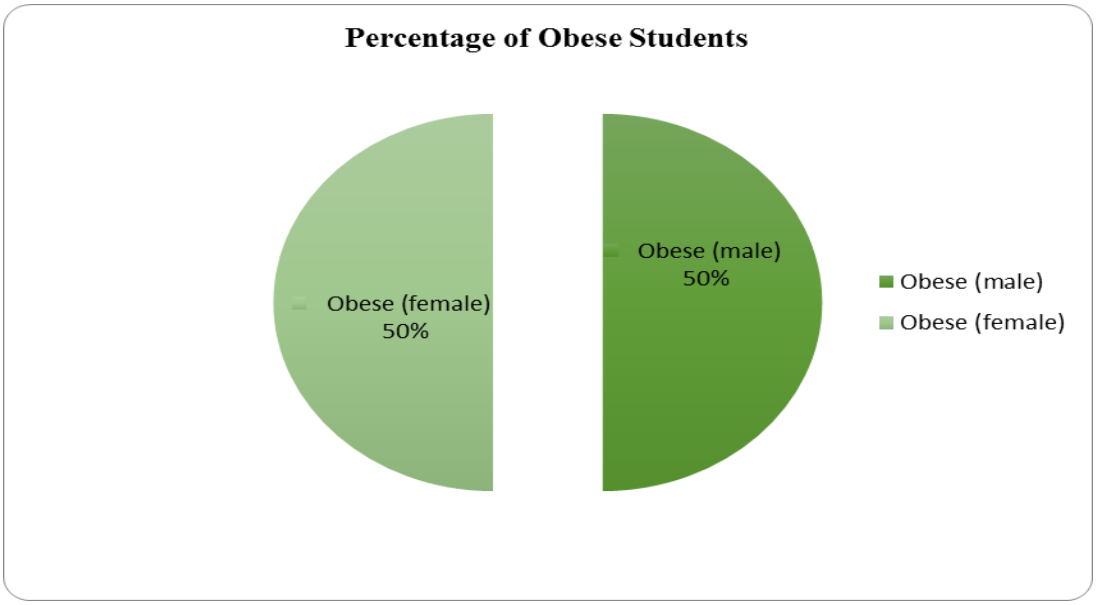

Fig 4.6: Percentage of obese students.

In this study 14 obese students were found. Among of them 50% were female and 50% were male.

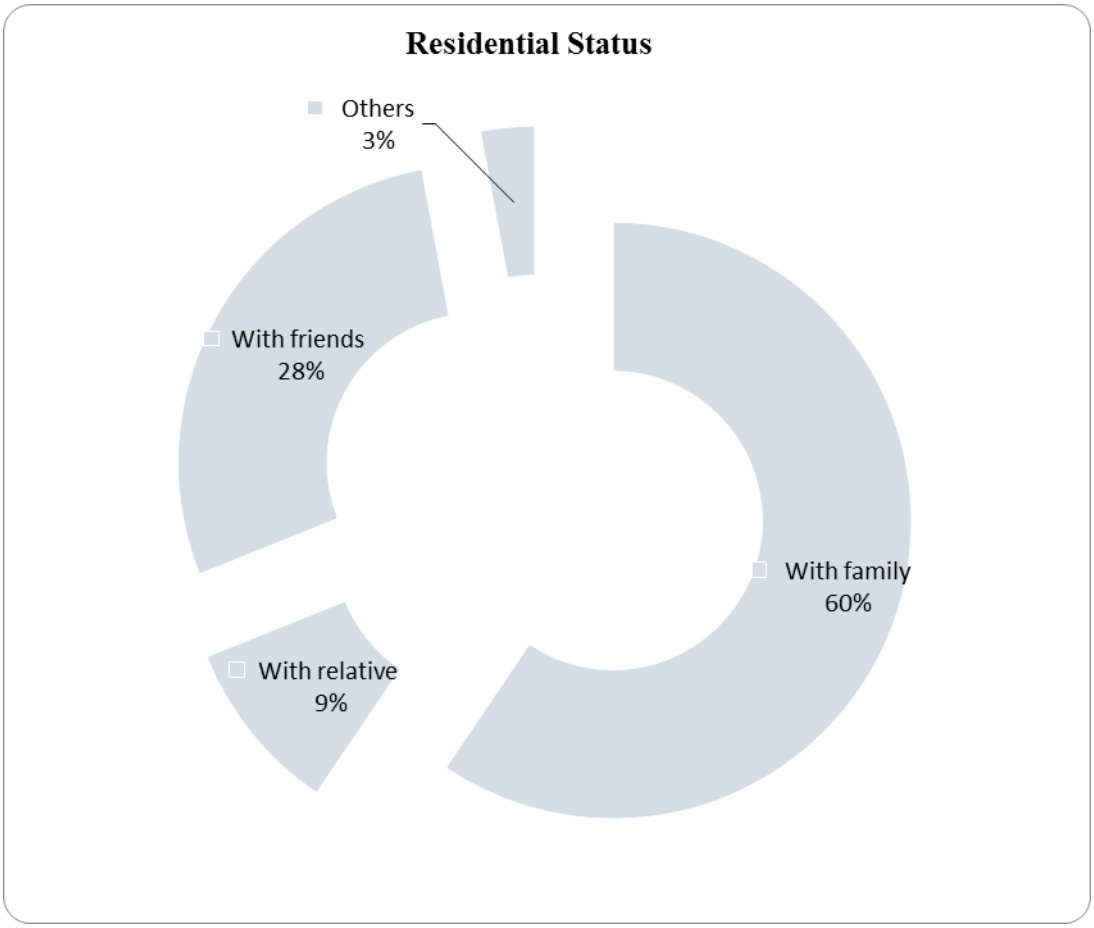

Fig 4.7: Residential Status of the Students.

Among 445 students, 60% lived with family, 9% with relative, 28% with friends and 3% in others category like lived alone, in hostel etc.

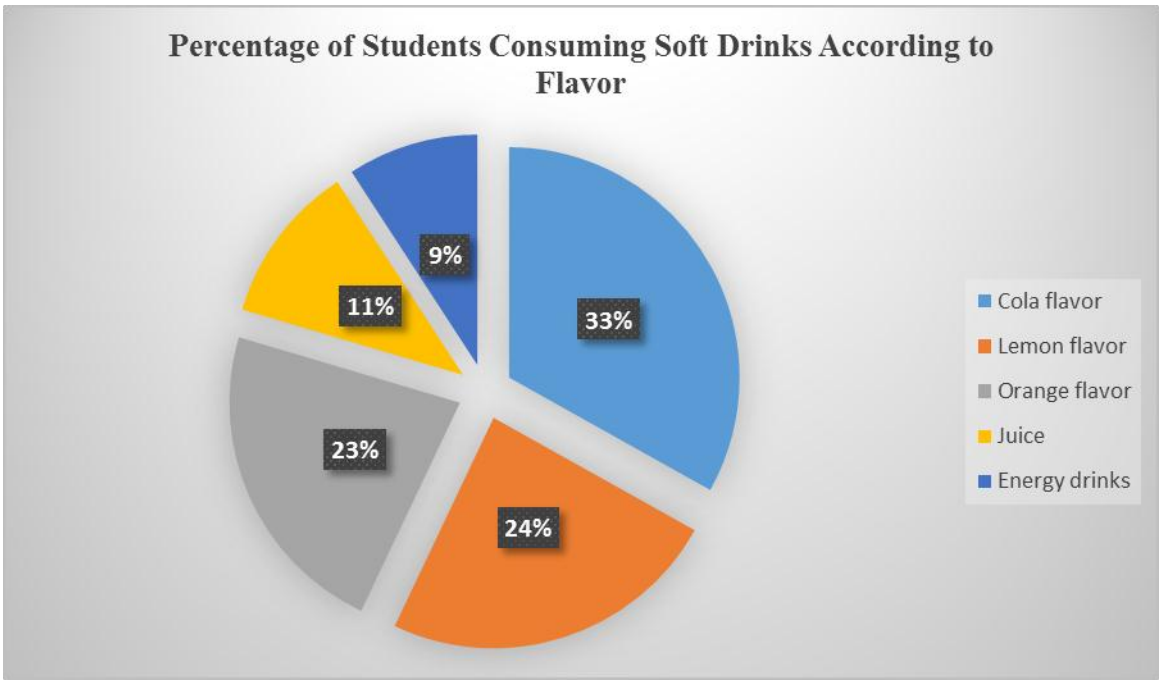

Fig 4.8: Percentage of Students Consuming Soft Drinks According to Flavor

In this study among 445 students, 35% students consumed cola flavor (Coca-cola, Pepsi), 24% students consumed lemon flavor (7UP, Sprite), 23% students consumed orange flavor (Fanta, Mirinda) soft drinks, 11% students consumed juice, 9% students consumed dew and 9% students consumed energy drinks.

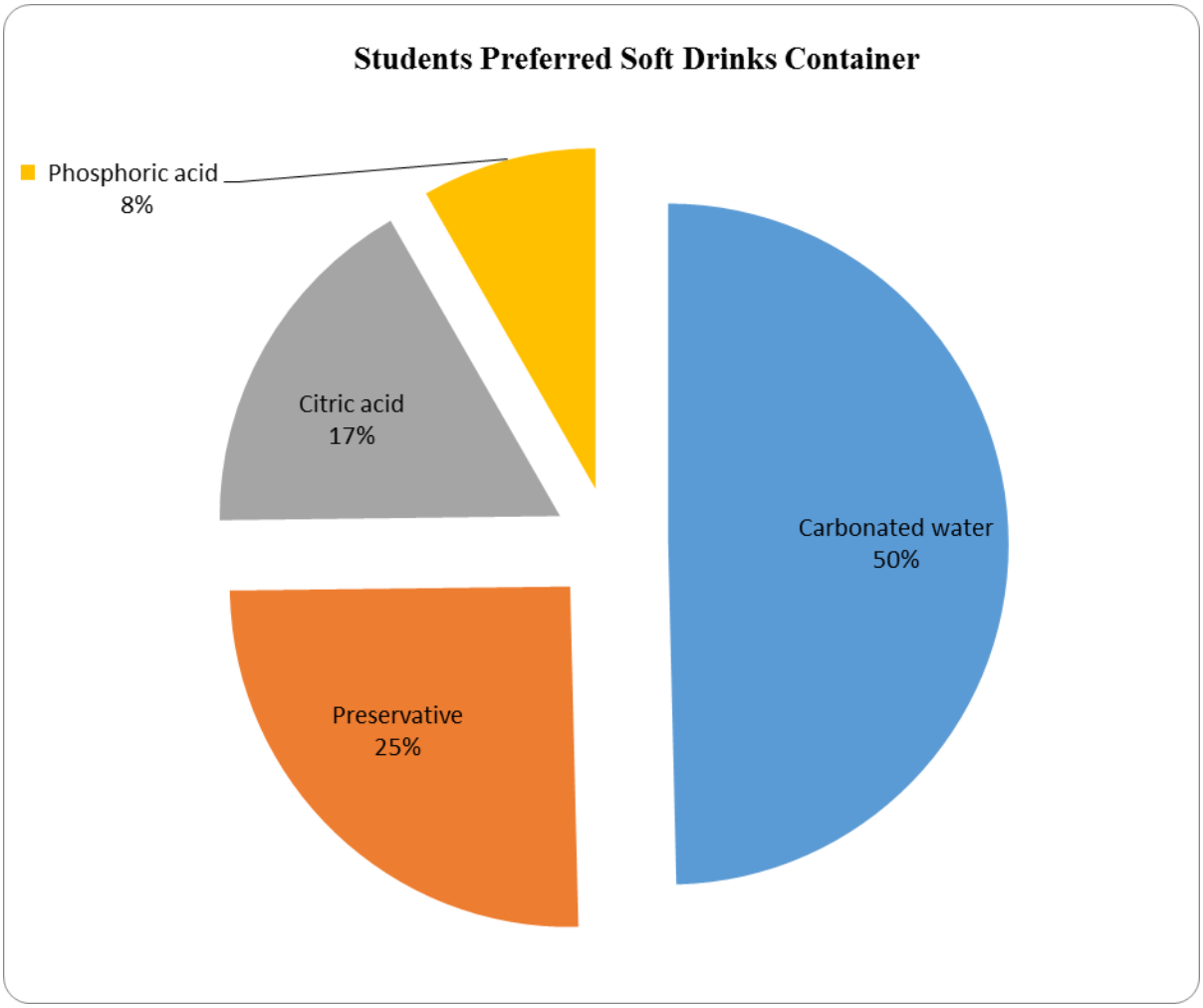

Fig 4.9: Students Preferred Soft Drinks Container

Among 445 students, 51% students preferred plastic bottle, 31% glass bottle, 14% can and 4% preferred one time glass (fountain) while consuming soft drinks.

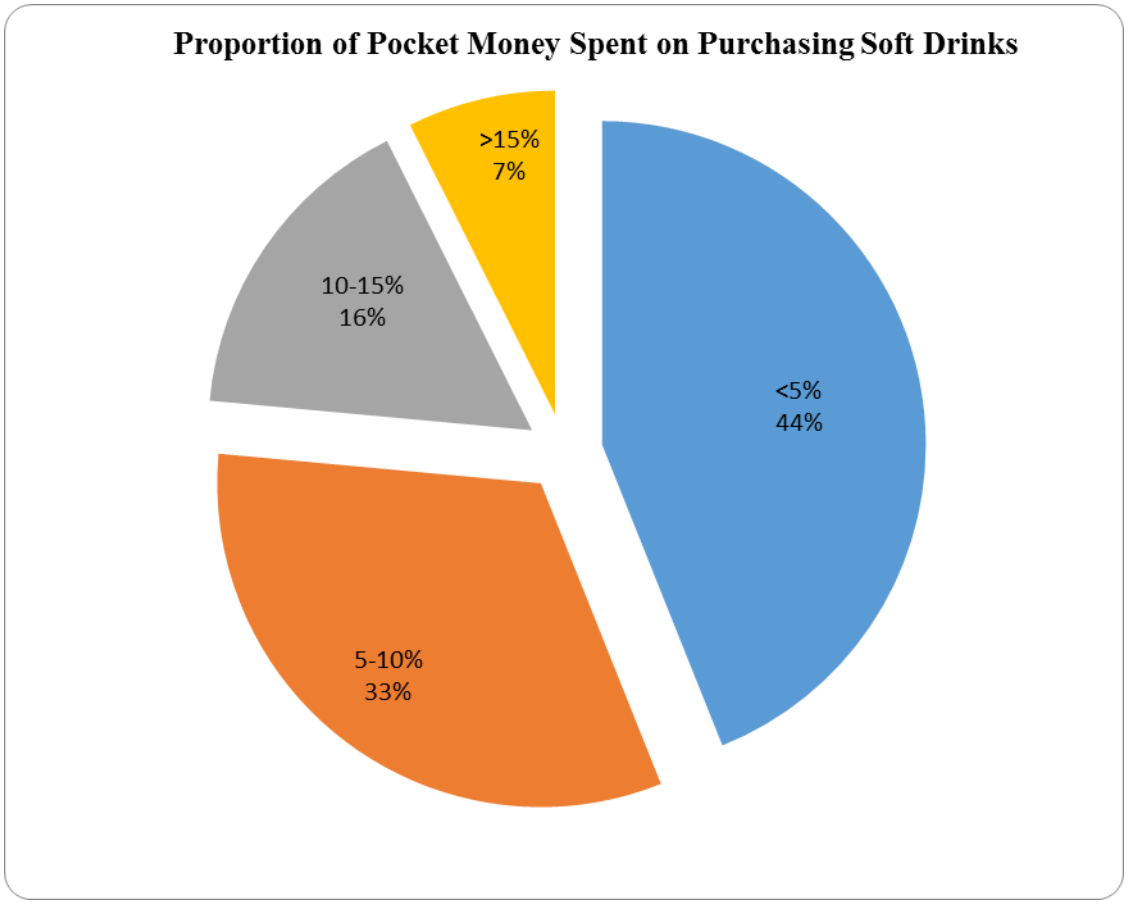

Fig 4.10: Proportion of pocket money spent on purchasing soft drinks

Among 445 students, 44% students spent less than 5% of their pocket money on purchasing soft drinks, 33% spent 5-10% of pocket money, 16% spent 10-15% of pocket money, 7% spent more than 15% of pocket money.

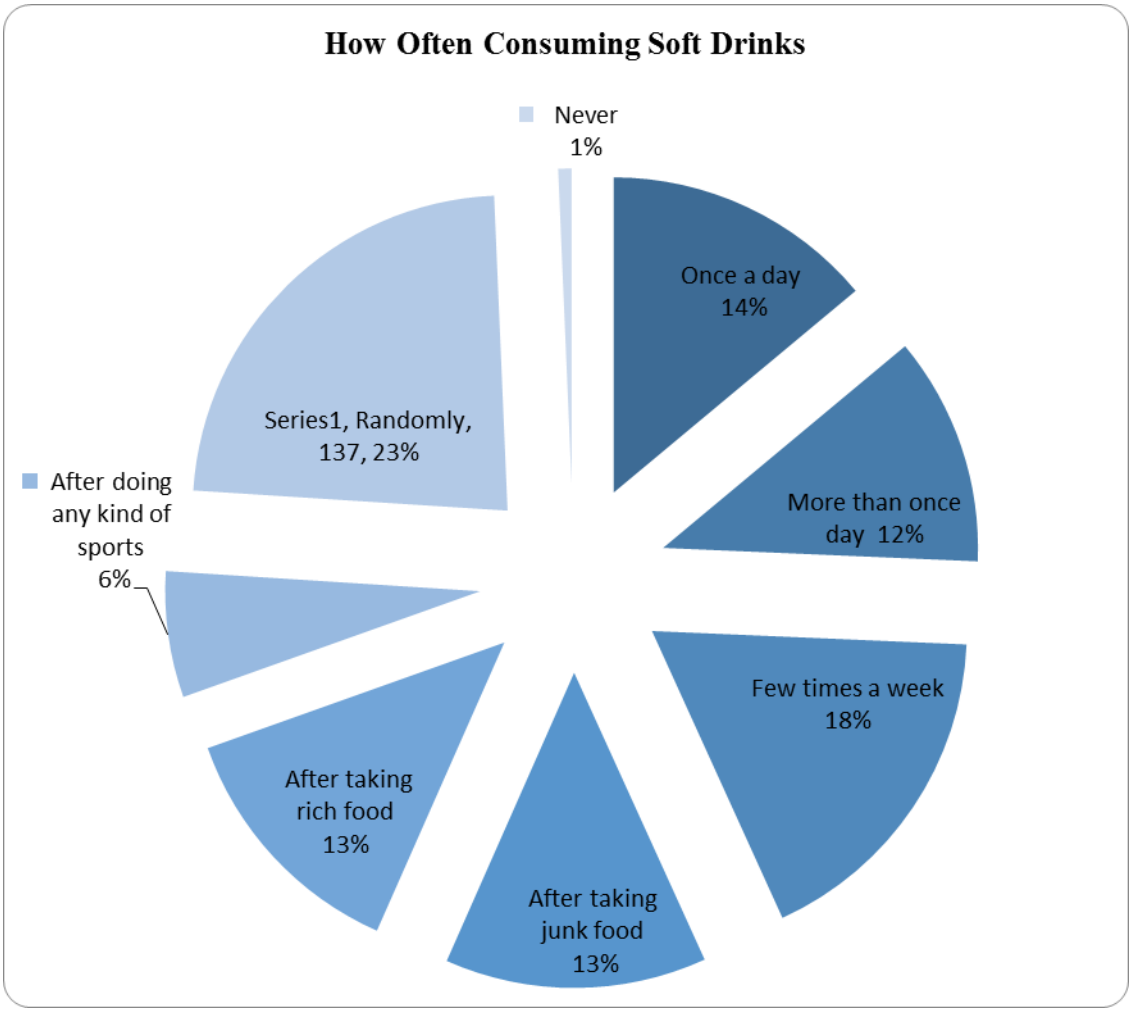

Fig 4.11: Percentage of often consuming soft drinks among students

Among 445 students, 23% students consumed soft drinks randomly, 18% students consumed few times a week, 14% students consumed once a day, 13% consumed after taking junk food, 13% consumed after taking rich food, 12% consumed more than once a day, 6% students consumed after doing any kind of sports and only 1% student never consumed soft drinks.

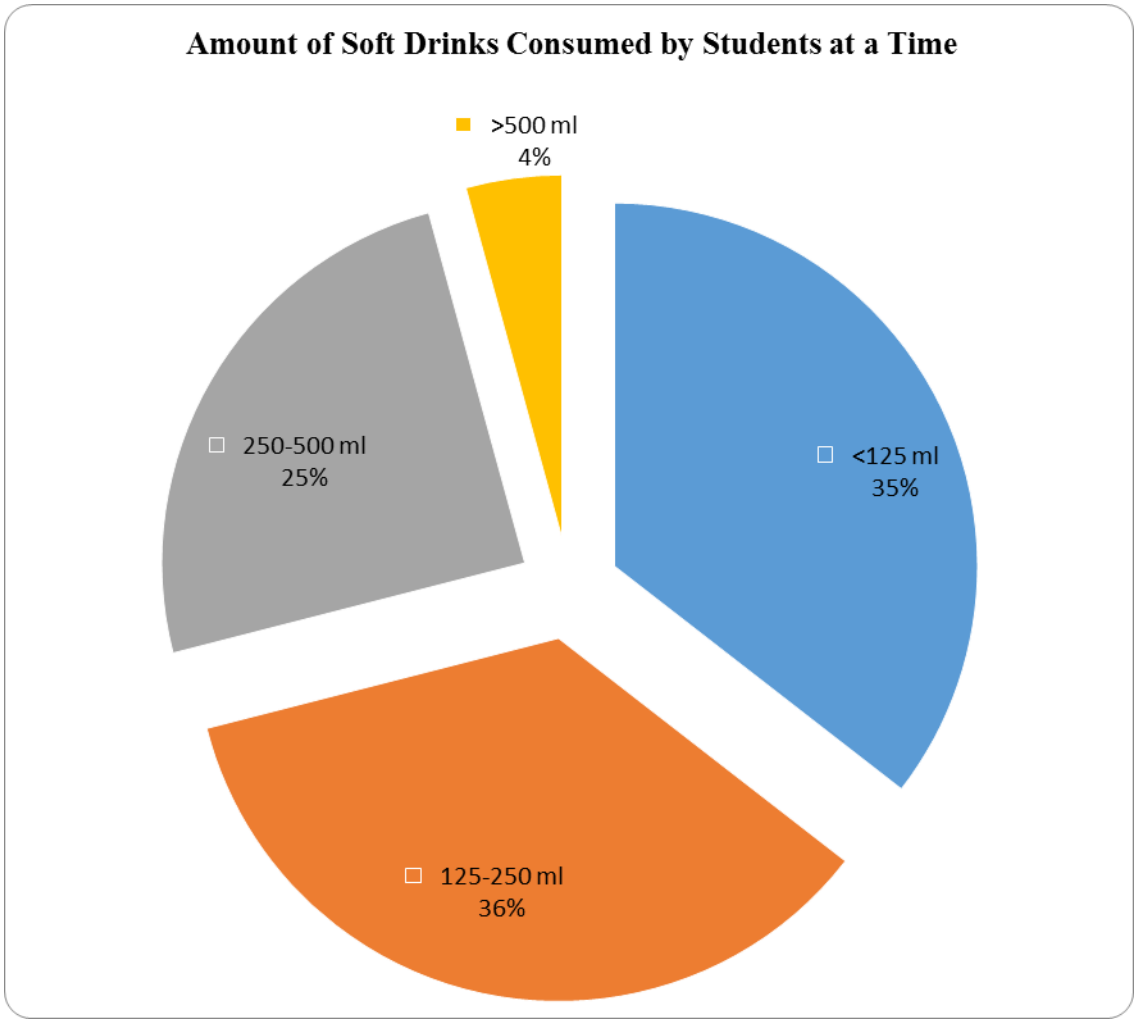

Fig 4.12: Percentage of amount of soft drinks consumed by students at a time

Among 445 students, 36% students consumed 125-250 ml soft drinks at a time, 35% consumed less than 125 ml, 25% consumed 250-500 ml and 4% consumed more than 250 ml at a time.

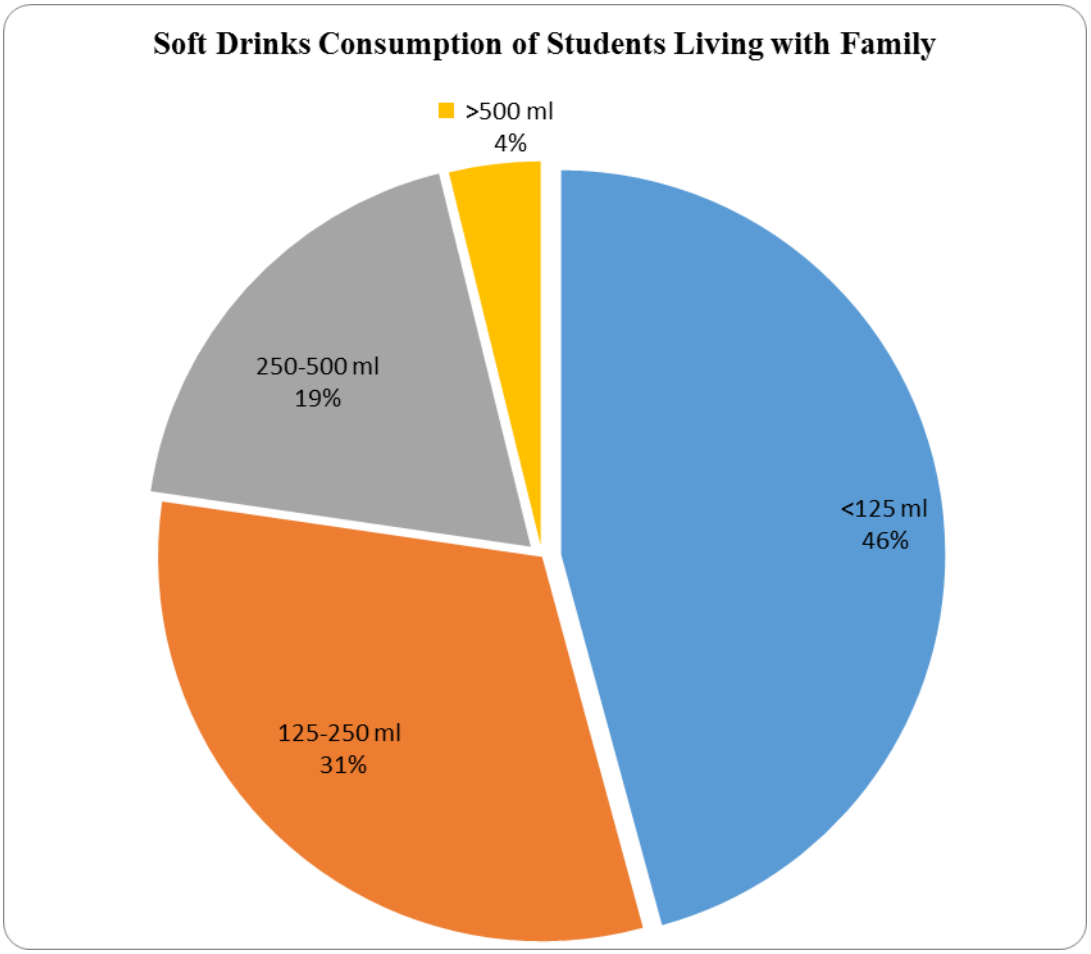

Fig 4.13: Soft Drinks Consumption of Students Living with Family

Among 264 students who lived with family 46% of consumed less than 125 ml soft drinks at a time, 31% of them consumed 125 to 250 ml at a time, 19% of them consumed 250 to 500 ml at time and other 4% of them consumed more than 500 ml soft drink at a time.

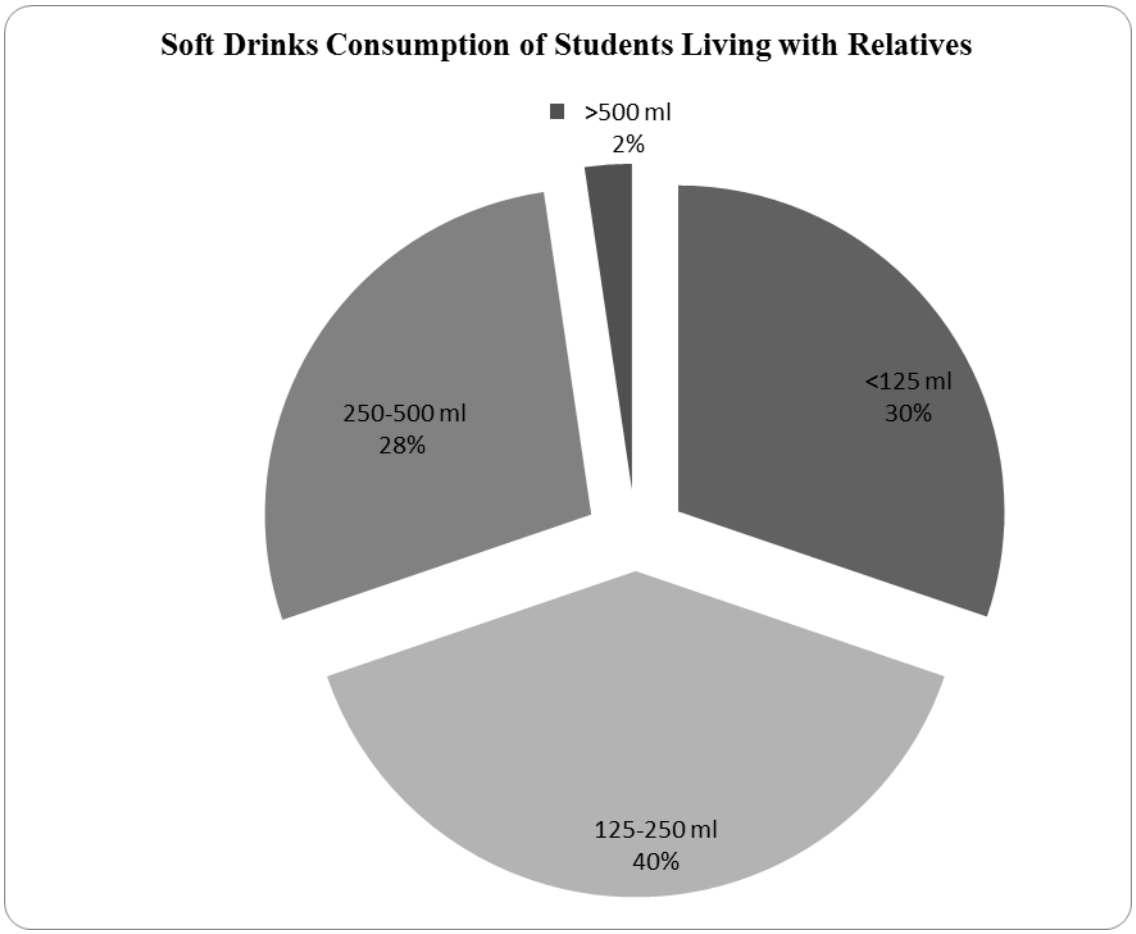

Fig 4.14: Soft Drinks Consumption of Students Living with Relatives

Among 43 students who lived with relatives, 30% consumed less than 125 ml soft drinks at a time, 40% consumed 125 to 250 ml, 28% consumed 250 to 500 ml and other 2% consumed more than 500 ml soft drink at a time.

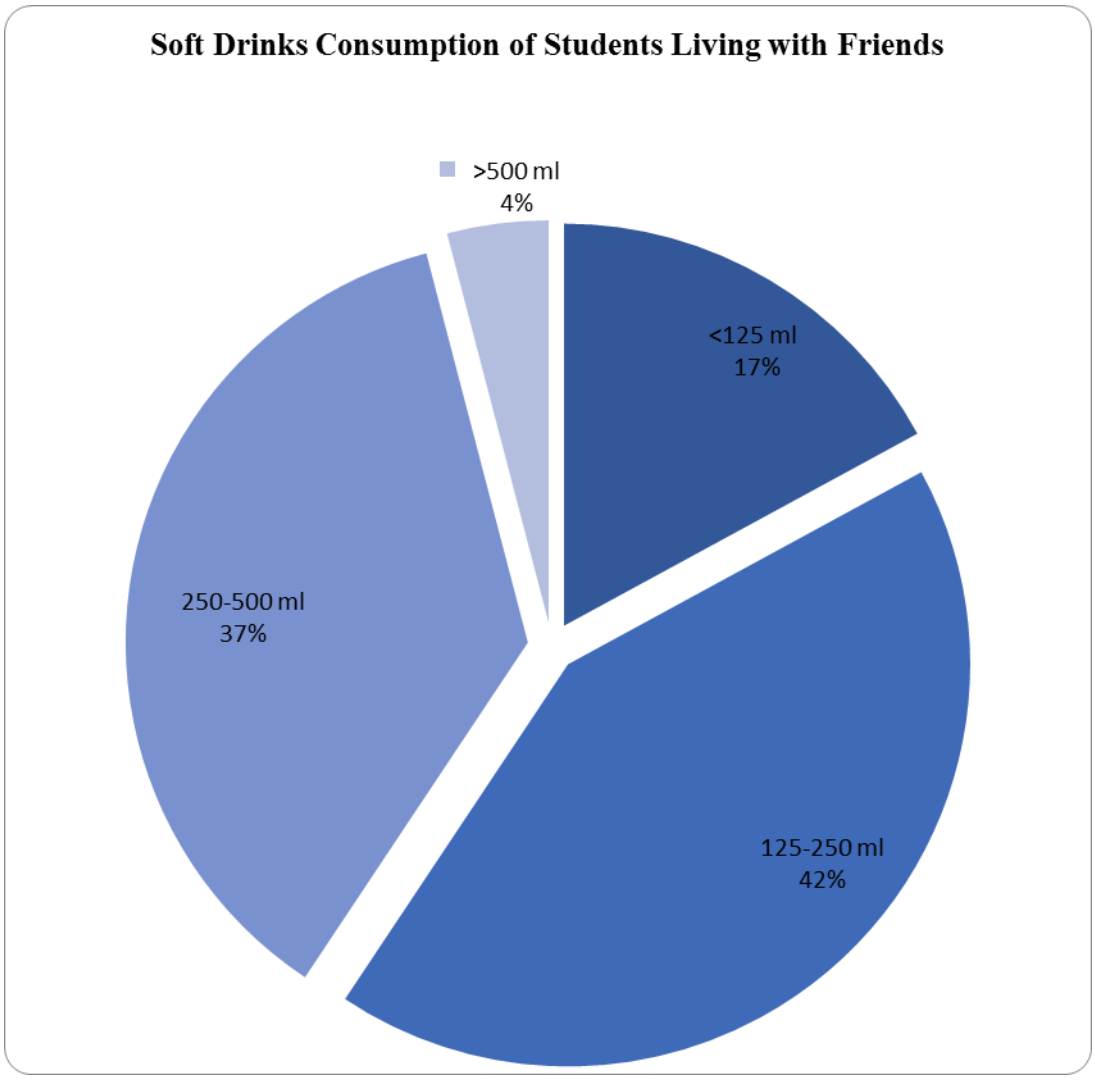

Fig 4.15: Soft Drinks Consumption of Students Living with Friends

Among 124 students who lived with friends, 17% of consumed less than 125 ml soft drinks at a time, 42% consumed 125 to 250 ml at a time, 37% consumed 250 to 500 ml and other 4% of them consumed more than 500 ml soft drink at a time

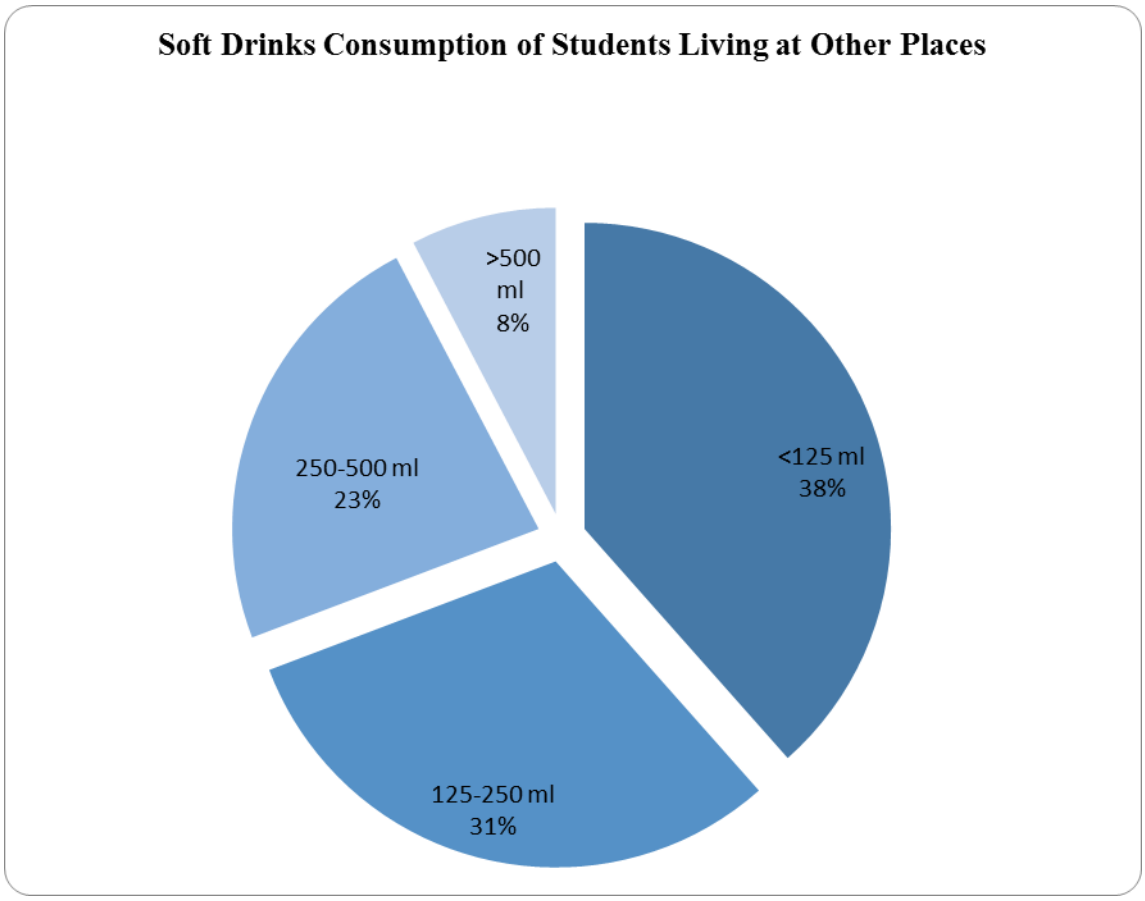

Fig 4.16: Soft Drinks Consumption of Students Living at Other Places

Among 13 students who lived at other places, 38% consumed less than 125 ml soft drinks at a time, 31% consumed 125 to 250 ml soft drinks at a time, 23% consumed 250 to 500 ml and other 8% of them consumed more than 500 ml soft drink at a time.

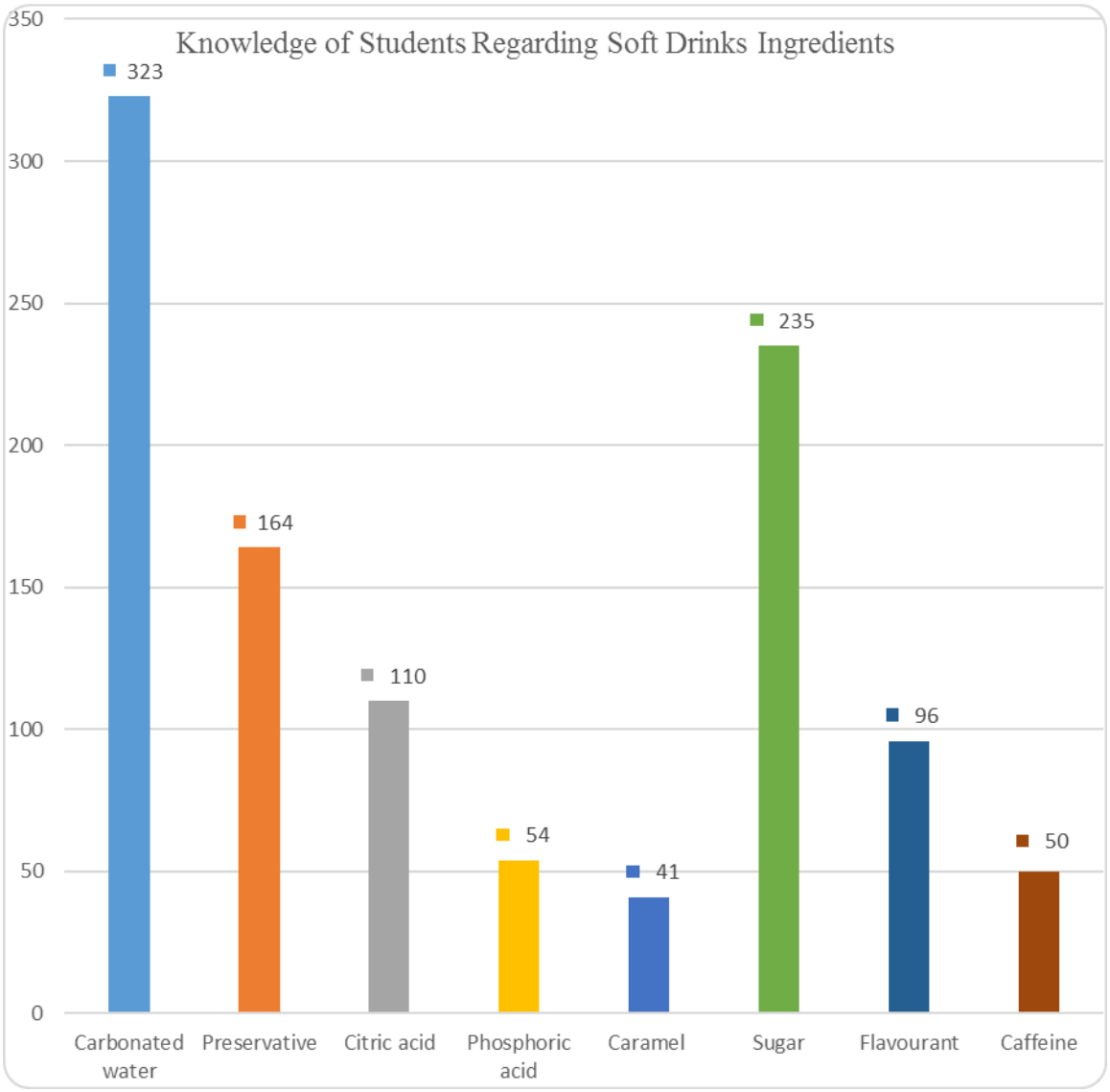

Fig 4.17: Knowledge of Students Regarding Soft Drinks Ingredients

Among 445 students 323 students knew about presence of carbonated water in soft drinks, 164 knew about the use of preservatives in soft drinks, 110 students knew about citric acid, 54 students knew about phosphoric acid, 41 students knew about caramel, 235 students knew about sugar, 96 students knew about flavourant and 50 students knew about caffeine in soft drinks. These all are the ingredients of soft drinks.

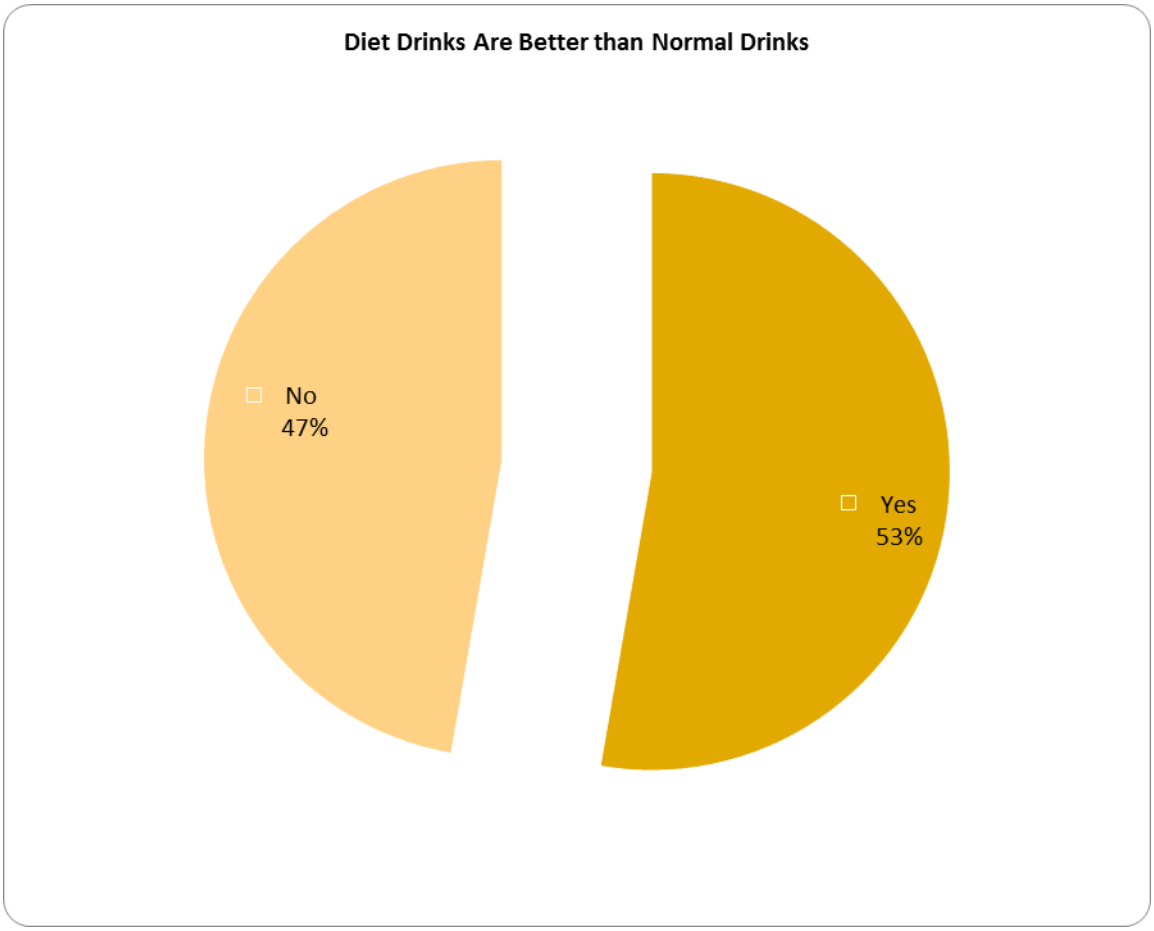

Fig 4.18: Diet Drinks Are Better than Normal Drinks

Among 445 students 53% students thought diet drinks is better than normal drinks and 47% students did not thinks diet drinks was better than normal drinks.

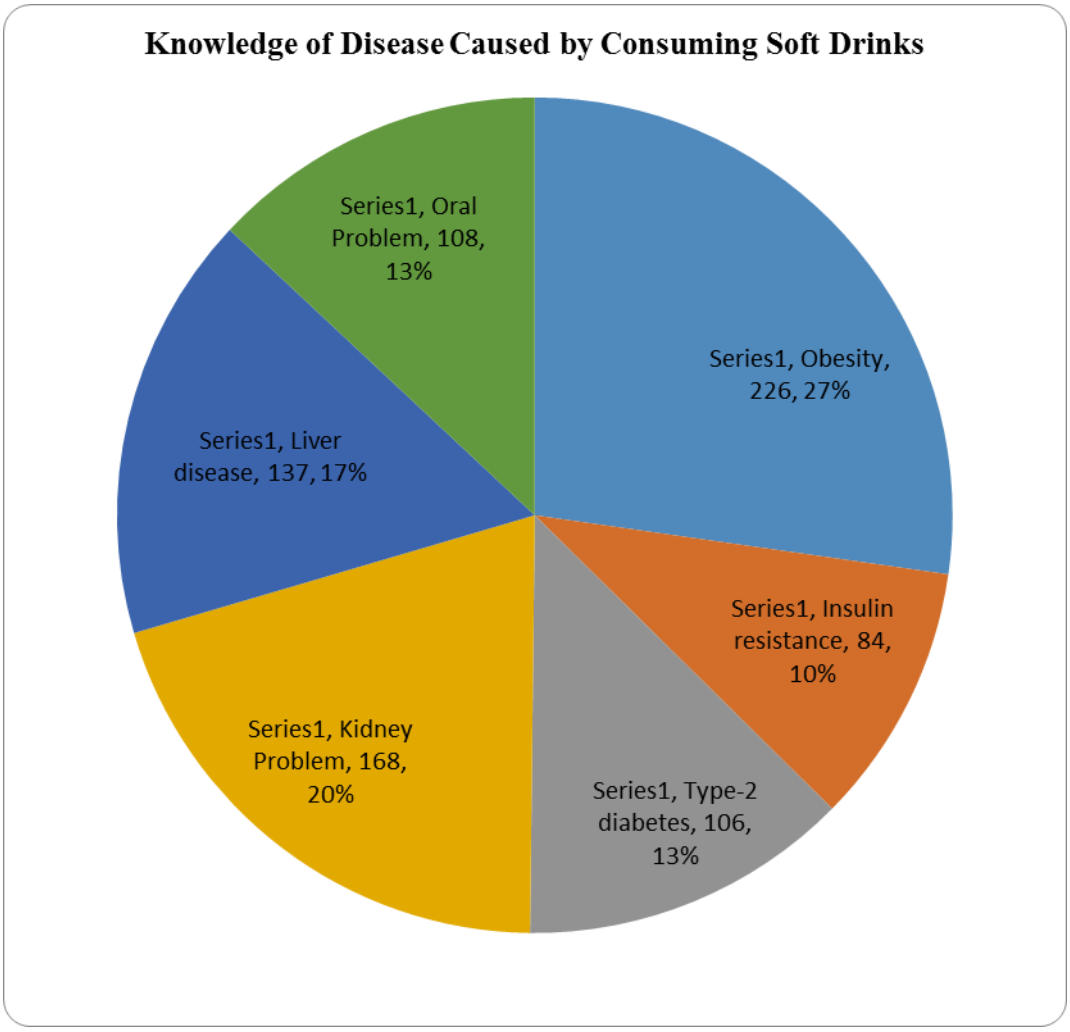

Fig 4.19: Knowledge of Disease Caused by Consuming Soft Drinks

Among 445 students 27% students knew that soft drinks can cause obesity, 27% knew kidney problem, 17% about liver diseases caused by consuming soft drinks, 13% students knew oral problem, 13% about knew Type-2 diabetes and 10% students knew about soft drinks causes insulin resistance.

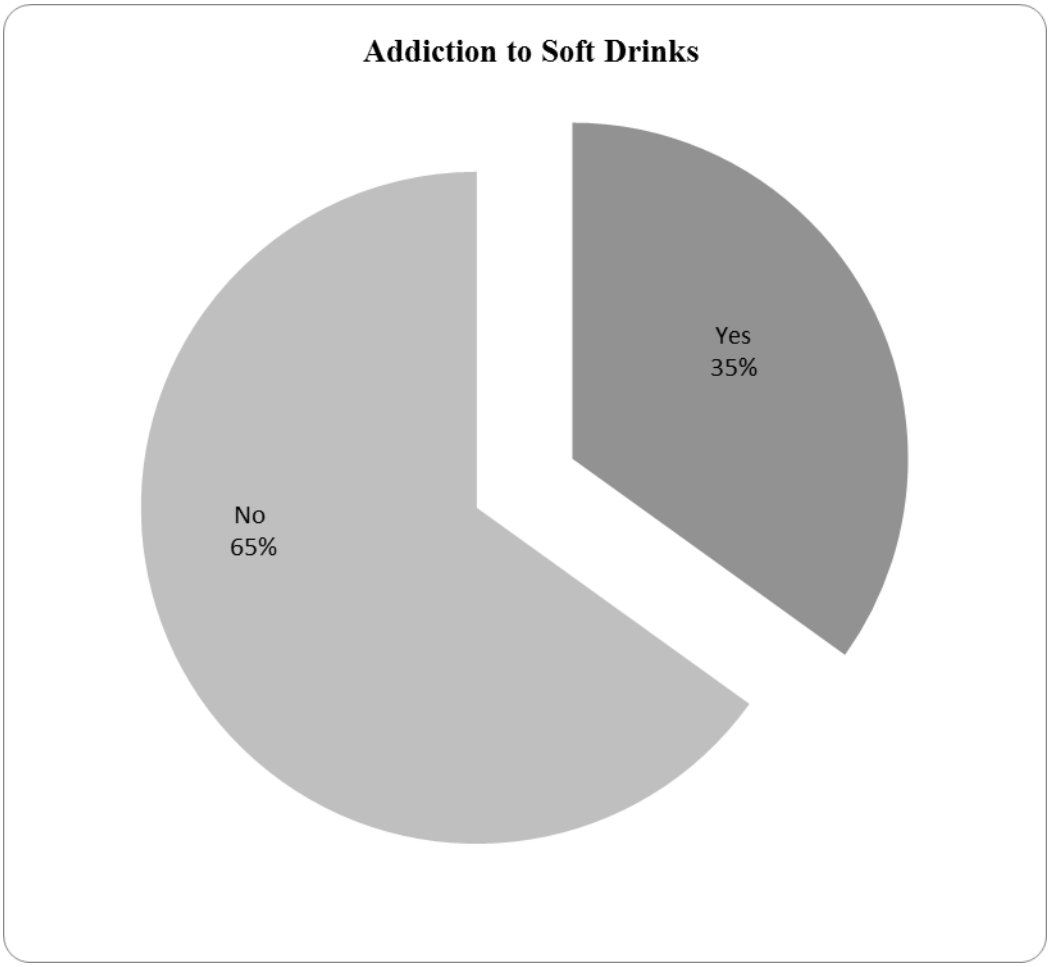

Fig 4.20: Student to Soft Drinks

Among 445 students, 35% students felt addicted to soft drinks with 65% students did not addicted to soft drinks.

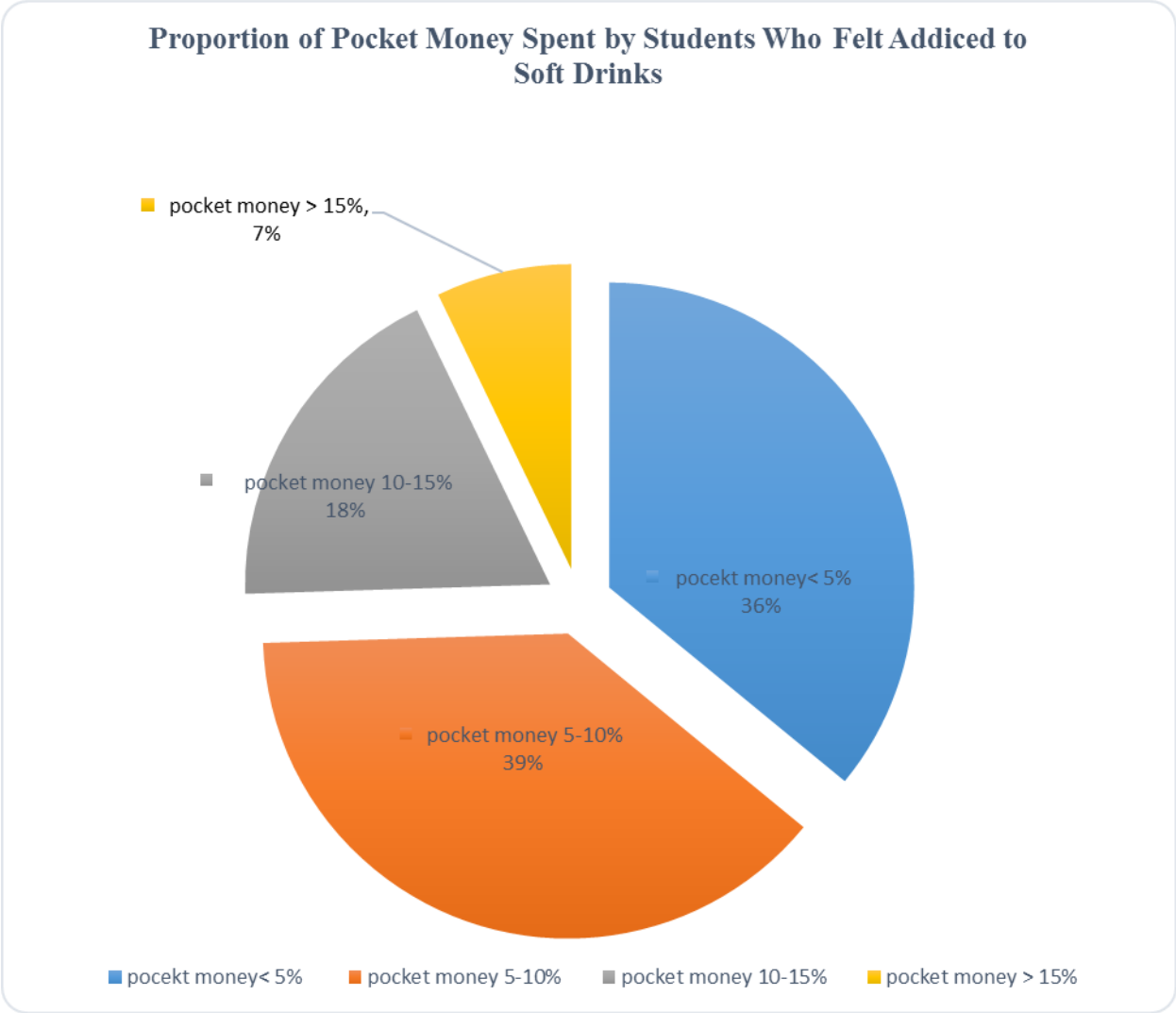

Fig 4.21: Proportion of Pocket Money Spent by Students Who Felt Addicted to Soft Drinks

Among 445 students 154 students feel addicted to soft drinks. Among 154 students 36% students spent less than 5% of their pocket money, 39% students who spend 5 to 10% of their pocket money feel addicted to soft drinks.18% students spent 10 to 15% of their pocket money, and 7% spent more than 15% of their pocket money.

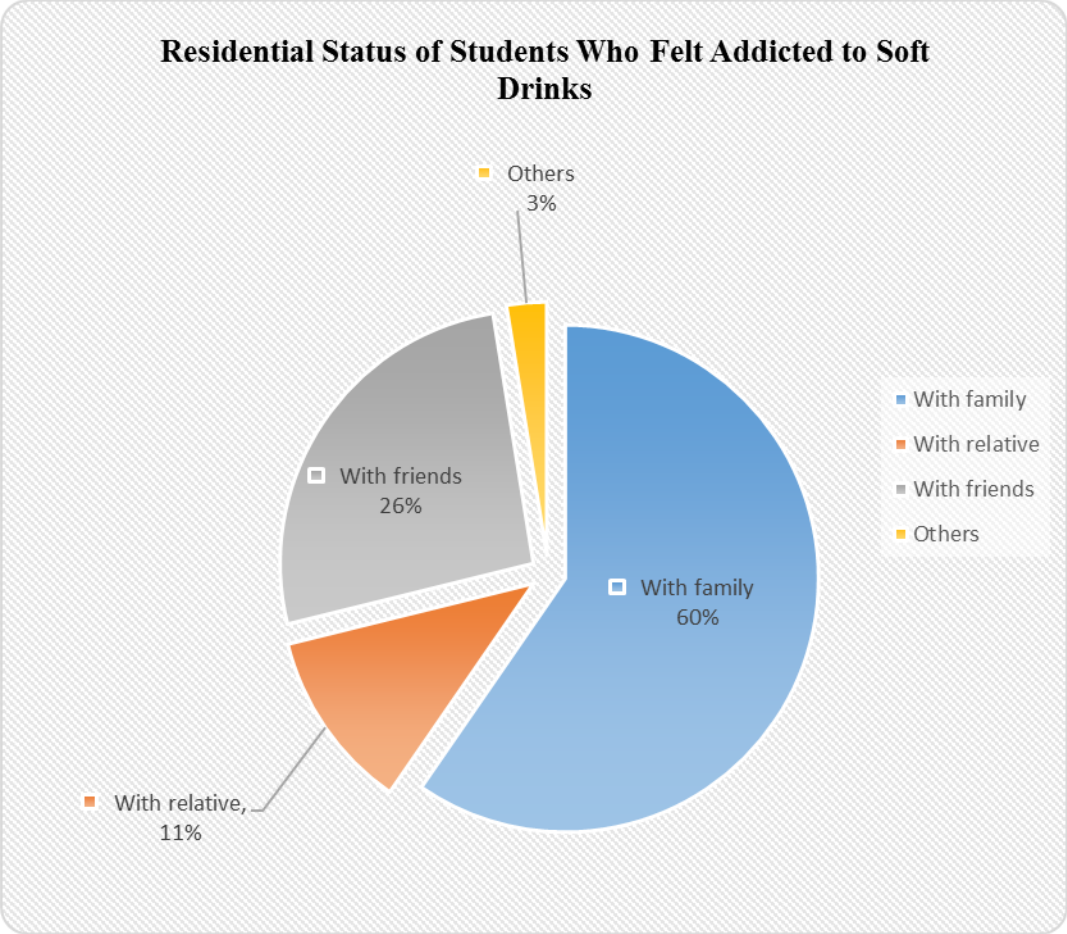

Fig 4.22: Residential Status of Students Who Felt Addicted to Soft Drinks

Among 445 students, 154 students are felt addicted to soft drinks. Among 154 students 60% of them lived with family, 11% lived with relative, 26% lived with friends and 3% lived at others places.

CHAPTER-5

DISCUSSION

Discussion

The survey included questions about frequency of soft drink consumption and factors related to soft drink consumption. The sample consisted of 560 children, 8 to 13 years old, who completed and mailed in the survey. There was an equal distribution of boys and girls (51% and 49%, respectively). Preference for the taste of soft drinks was the strongest predictor in the analysis, with those who reported the strongest taste preference 4.50 times more likely (95% confidence interval=2.89–7.04) to consume soft drinks five or more times per week than those with a lower taste preference. Youth whose parents regularly drank soft drinks were 2.88 times more likely (95% confidence interval=1.76–4.72) to consume soft drinks five or more times per week compared with those whose parents did not regularly drink soft drinks. Results suggest that several factors may be associated with soft drink intake in school-aged children, most notably taste preferences, soft drink consumption habits of parents and friends, soft drink availability in the home and school, and television viewing. (Grimm, Harnack and Story, 2017)

This survey included questions about soft drinks intake behaviour among university going students. Our survey was conducted on students of East West University and the sample consisted of 445 students, with BMI range 16 to 40, who completed questionnaires in the survey. Among of the students 67% were male and 33% were female. In this study among 445 students 32% students consumed cola flavor (Coca-cola, Pepsi), 24% students consumed lemon flavor (7UP, Sprite),21% students consumed orange flavor (Fanta, Mirinda) soft drinks, 11% students consumed juice,9% students consumed dew and 3% students consumed energy drinks. 264 of 445 students lived with family 46% of them consumed less than 125 ml soft drinks at a time, 31% of them consumed 125 to 250 ml at a time, 19% of them consumed 250 to 500 ml soft drinks ad 4% consumed more than 500 ml soft drink at a time. Among 445, 23% students consumed soft drinks randomly, 18% few times a week, 14% students consumed soft drinks once a day, 13% drinks after taking junk food, 13% after taking rich food, 12% more than once a day, 6% after doing any kind of sports only 1% student never consumed soft drinks. 65% students not felt addicted to soft drinks.

CHAPTER-6

CONCLUSION

Conclusion

A soft drink (also referred to as soda, coke, pop, soda pop, or fizzy drink) is a non-alcoholic beverage that usually contains carbonated water, a sweetener, and flavoring. The sweetener is typically sugar, high-fructose corn syrup, or a sugar substitute (as is the case in diet soft drinks). Soft drinks can also contain fruit juice or caffeine. (Zidbits - Learn something new everyday!, 2017). Soft drinks can be part of a healthy and balanced lifestyle because they are important contributors to hydration and light beverages can be an integral part of weight loss plans. (Unesda, 2017). Despite having few health benefit consumption of soft drinks have more complications. Ingredients of soft drinks cause many health complication and chronic health problem. Many of the students were aware about the ingredient of soft drinks and damage that occur by consumption of soft drinks. Many complications like obesity, type-2 diabetes, insulin resistance, kidney problem, liver disease, oral Problem can raise by consuming soft drinks on a daily basis. During this study it has been observed that majority of the university students of East West University, Dhaka consume different type of soft drinks regularly. Although majority of them know about the complications caused by consuming soft drinks. They spend a good amount of their pocket money for purchasing soft drinks. Many of them intake considerable amount of soft drinks per day. A significant amount of students also felt addicted to soft drinks. Public awareness should be needed to increase awareness regarding consumption of soft drinks as a part of a healthy life style. This study was done only on the students of East West University so it only represents the fitness status of this university student. The data would be effective if more data were collected from different university students. Doing survey on different students on different part of Bangladesh can expand the study. The expanded study will represent statistical data about the consumption of soft drinks among students of whole Bangladesh.

CHAPTER-7

REFERENCES

References

Assy, N., Nasser, G., Kamayse, I. and Nseir, W. (2017). Soft Drink Consumption Linked with Fatty Liver in the Absence of Traditional Risk Factors. Available at: https://www.ncbi.nlm.nih.gov/pubmed/18925303 [Accessed 25 Oct. 2017].

Britishsoftdrinks.com. (2017). Ingredients. [online] Available at: http://www.britishsoftdrinks.com/Ingredients [Accessed 25 Oct. 2017].

Choi, H. and Curhan, G. (2017). Soft drinks, fructose consumption, and the risk of gout in men: prospective cohort study. Available at: http://www.bmj.com/content/336/7639/309 [Accessed 25 Oct. 2017].

Dhingra, R., Sullivan, L. and Jacques, P. (2017). Soft Drink Consumption and Risk of Developing Cardiometabolic Risk Factors and the Metabolic Syndrome in Middle-Aged Adults in the Community. Available at: https://www.ncbi.nlm.nih.gov/pubmed/17646581 [Accessed 25 Oct. 2017].

Emedexpert.com. (2017). Reasons Why People Drink Soda & Why To Stop Its Drinking. [online] Available at: http://www.emedexpert.com/tips/soft-drinks.shtml [Accessed 25 Oct. 2017].

Encyclopedia Britannica. (2017). soft drink | beverage. [online] Available at: https://www.britannica.com/topic/soft-drink [Accessed 25 Oct. 2017].

Fortune. (2017). Soda Consumption Falls to 30-Year Low In The U.S.. [online] Available at: http://fortune.com/2016/03/29/soda-sales-drop-11th-year [Accessed 25 Oct. 2017].Grimm, G., Harnack, L. and Story, M. (2017). Factors associated with soft drink consumption in school-aged children. Available at: https://www.ncbi.nlm.nih.gov/pubmed/15281041 [Accessed 25 Oct. 2017].

Harnack, L., Stang, J. and Story, M. (2017). Soft Drink Consumption Among US Children and Adolescents. Available at: https://www.ncbi.nlm.nih.gov/pubmed/10207395 [Accessed 25 Oct. 2017].

Hattersley, L., Irwin, M., King, L. and Allman-Farinelli, M. (2017). Determinants and patterns of soft drink consumption in young adults: a qualitative analysis. Available at: https://www.ncbi.nlm.nih.gov/pubmed/19195421 [Accessed 25 Oct. 2017].

Johnson, R., Appel, L. and Brands, M. (2017). Dietary Sugars Intake and Cardiovascular Health: A Scientific Statement From the American Heart Association. Available at: https://www.ncbi.nlm.nih.gov/pubmed/19704096 [Accessed 25 Oct. 2017].

Larsen, M. and Nyvad, B. (2017). Enamel Erosion by Some Soft Drinks and Orange Juices Relative to Their pH, Buffering Effect and Contents of Calcium Phosphate. Available at: https://www.ncbi.nlm.nih.gov/pubmed/9831784 [Accessed 6 Nov. 2017].

Lenny R. Vartanian, e., ,Marlene B. Schwartz and Kelly D. Brownell (2017). Effects of Soft Drink Consumption on Nutrition and Health: A Systematic Review and Meta-Analysis | AJPH | Vol. 97 Issue 4. [online] Ajph.aphapublications.org. Available at: http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2005.083782 [Accessed 6 Nov. 2017].

Malik, V., Schulze, M. and Hu, F. (2017). Intake of sugar-sweetened beverages and weight gain: a systematic review. [online] Ajcn.nutrition.org. Available at: http://ajcn.nutrition.org/content/84/2/274.short [Accessed 9 Nov. 2017].

McGartland, C., Robson, P., Murray, L. and Cran, G. (2017). Carbonated Soft Drink Consumption and Bone Mineral Density in Adolescence: The Northern Ireland Young Hearts Project. Available at: https://www.ncbi.nlm.nih.gov/pubmed/12968664 [Accessed 9 Nov. 2017].

Montonen, J., Järvinen, R. and Knekt, P. (2017). Consumption of Sweetened Beverages and Intakes of Fructose and Glucose Predict Type 2 Diabetes Occurrence. [online] Jn.nutrition.org. Available at: http://jn.nutrition.org/content/137/6/1447.short [Accessed 9 Nov. 2017].

Nada O. Kassem, e. and Jerry W. Lee (2017). Understanding soft drink consumption among female adolescents using the Theory of Planned Behavior. Available at: https://www.ncbi.nlm.nih.gov/pubmed/12828230 [Accessed 6 Nov. 2017].

Nur Mohammad Monsur, e. (2017). EBSCOhost | 35835928 | Risk Indicators for Tooth Loss due to Caries and Periodontal Disease in Recipients of Free Dental Treatment in an Adult Population in Bangladesh. [online] Eds.a.ebscohost.com. Available at: http://eds.a.ebscohost.com/abstract?site=eds&scope=site&jrnl=16021622&AN=35835928&h=gKnALLGLlZQX1b5a86f6uR8%2bA0K2BqAMX2EA34PDjt0liGdYJ4VPuQRv%2fvLTqbUr87DtOawuatm8PIyIrqMUOg%3d%3d&crl=c&resultLocal=ErrCrlNoResults&resultNs=Ehost&crlhashurl=login.aspx%3fdirect%3dtrue%26profile%3dehost%26scope%3dsite%26authtype%3dcrawler%26jrnl%3d16021622%26AN%3d35835928 [Accessed 6 Nov. 2017].

Oxford Dictionaries | English. (2017). soft drink | Definition of soft drink in US English by Oxford Dictionaries. [online] Available at: https://en.oxforddictionaries.com/definition/us/soft_drink [Accessed 25 Oct. 2017].

Sanjay Basu, e., Martin McKee and Gauden Galea (2017). Relationship of Soft Drink Consumption to Global Overweight, Obesity, and Diabetes: A Cross-National Analysis of 75 Countries | AJPH | Vol. 103 Issue 11. [online] Ajph.aphapublications.org. Available at: http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2012.300974 [Accessed 6 Nov. 2017].

Shuster, e. and Logan, c. (2017). Soft drink consumption and urinary stone recurrence: A randomized prevention trial. Available at: https://www.ncbi.nlm.nih.gov/pubmed/1624973 [Accessed 25 Oct. 2017].

Skinner, J., Byun, R. and Blinkhorn, A. (2017). Sugary drink consumption and dental caries in New South Wales teenagers. Available at: https://www.ncbi.nlm.nih.gov/pubmed/25988969 [Accessed 25 Oct. 2017].

Slater, P., Gkolia, P., Johnson, H. and Thomas, A. (2017). Patterns of soft drink consumption and primary tooth extractions in Queensland children. Available at: https://www.ncbi.nlm.nih.gov/pubmed/21133943 [Accessed 25 Oct. 2017].

Statista. (2017). U.S. per capita consumption of soft drinks, 2015 | Statistic. [online] Available at: https://www.statista.com/statistics/306836/us-per-capita-consumption-of-soft-drinks/ [Accessed 25 Oct. 2017].

Sweetman, C., Wardle, J. and Cooke, L. (2017). Soft drinks and 'desire to drink' in preschoolers.

The Nutrition Source. (2017). Soft Drinks and Disease. [online] Available at: https://www.hsph.harvard.edu/nutritionsource/healthy-drinks/soft-drinks-and-disease/ [Accessed 25 Oct. 2017].

Unesda. (2017). Consumption - Unesda. [online] Available at: http://www.unesda.eu/products-ingredients/consumption/ [Accessed 25 Oct. 2017].

Vasanti S Malik, e., Matthias B Schulze and Frank B Hu (2017). Intake of sugar-sweetened beverages and weight gain: a systematic review1,2,3. [online] Available at: http://ajcn.nutrition.org/content/84/2/274.short [Accessed 6 Nov. 2017].

www.statista.com. (2017). Topic: Non-alcoholic Beverages and Soft Drinks. [online] Available at: https://www.statista.com/topics/1662/non-alcoholic-beverages-and-soft-drinks-in-the-us/ [Accessed 25 Oct. 2017].

Zidbits - Learn something new everyday!. (2017). Why Are Carbonated Beverages Called Soft Drinks?. [online] Available at: https://zidbits.com/2011/07/why-are-carbonated-beverages-called-soft-drinks/ [Accessed 25 Oct. 2017].