

**PATTERN OF CONSUMPTION OF SOFT DRINKS AND PERCEPTION
OF VULNERABILITY TO NON-COMMUNICABLE DISEASES AMONG
STUDENTS OF POLYTECHNIC IBADAN, OYO STATE NIGERIA**

BY

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DEDICATION

This research work is dedicated to the Almighty God and to my lovely mother Mrs. Christianah Olufunmilayo Olaofe who is God's instrument in my life.

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ABSTRACT

Popularity and consumption of soft drinks (SDs) that contain empty calorie due to high sugar contents has been increasing steadily due to strong palatable sweet taste. It is one of the critical issues in dietary transition in spite of the associated adverse health implications. There is a dearth of research on perceived health consequences of soft drinks consumption among young people. Hence, this study was aimed at investigating pattern of consumption of (SDs) and perception of vulnerability to non-communicable diseases (NCDs) among students of The Polytechnic Ibadan.

This study employed a cross-sectional study design using a four-stage sampling technique in selecting 423 respondents from hall of residence in The Polytechnics consisting 199 out of 1021 females and 224 out of 1147 males, respectively. A self-administered semi-structured questionnaire was used to elicit information on SDs and perception of vulnerability to NCDs and observational checklist was also used to assess soft drink outlets in the four hall of residence. Knowledge of causes of NCDs were measured on a 12-point scale; score >6 was categorised as good and knowledge of health implications of SDs were measured on a 9-point scale; score >5 was categorised as good. Perception of health implication of SDs consumption was measured on 9-point scale; scores >5 was categorised as good. Data were analysed using descriptive and inferential statistics (Chi-square test) at $p=0.05$ level of significance.

Age of respondents was 23.1 ± 3.3 years and 53.0% were males. Large percentages (96.0%) of respondents were single and their levels of study ranged from ND1 to HND2. Few of the respondents (39.0%) did collect pocket money weekly; monthly (38.3%) and daily (22.7%). More than half (53.0%) of respondents consumed one bottle of 50cl of soft drink daily on average. Majority (76.4%) claimed to have easy access to SDs. About (65.0%) respondents had poor knowledge of the causes of NCDs. Majority of respondents (60.0%) had good knowledge of health implication of SDs. Majority of respondents (69.3%) had poor perception about SDs consumption. Many of respondents (59.3%) believed sweetness of SDs make them to consume it. Majority of respondents (77.1%) said SDs were easy available in many retail shops in the school. About (77.1%) of respondents were of the view that different sales promotion on SDs like free airtime on bottle cover encouraged them to consume more. Soft drink outlets are present

in three out of four halls of residence and there is easy access to soft drinks in all the halls. Frequency of collecting pocket money was significantly associated with pattern of consumption of SDs, accessibility was significantly associated with pattern of consumption of SDs and perception of SDs was significantly associated with pattern of consumption of SDs.

There were gaps in knowledge about NCDs, knowledge of health implication of SDs was good and perception of SDs was poor. Use of educational campaigns and behavioural change communication (BCC) materials would be useful in addressing various identified misconceptions that encourage excessive SDs consumption.

Keywords: Soft drinks, Non-communicable diseases, Polytechnic students

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CERTIFICATION

I certify that this study was carried out by Olaronke Busayo OLAOFE in the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan, Nigeria.

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ABBREVIATIONS

BCC	Behavioural Change Communication
COACH	Communication on Obesity Action for Child Health
HCSDs	High Calorie Soft Drinks
HND	Higher National Diploma
NCDs	Non-Communicable Diseases
ND	National Diploma
SSBs	Sugar Sweetened Beverages
WHO	World Health Organization

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OPERATIONAL DEFINITION OF TERMS

- High calorie soft drinks:** Is a non-alcoholic beverage that typically contain water, a sweetener, acid and a flavoring agent that contain high amount of sugar content in form of fluid which do not give satiety.
- Perception:** It is an understanding based on what is thought or observed about high calorie soft drink consumption. It is also an individual' view about the consumption of high calorie soft drinks based solely on personal judgment.
- Perception Vulnerability:** The perception of risk of developing NCDs as a result of high calorie soft drinks consumption. It is reviewed in this study from the perspective of opinion and belief.
- Non-communicable diseases:** These are diseases that cannot be transmitted from one person to another. Examples are diabetes mellitus, cardiovascular diseases, Cancer, chronic respiratory diseases.

CHAPTER ONE

INTRODUCTION

1.1 Background

Diet-related diseases such as cardiovascular diseases, obesity, type II diabetes and cancer are now diagnosed across the world and have a significant effect on public health. One of the critical components in the shift of diets is the increased intake of soft drinks and sugary fruit drinks (Popkin and Nielsen, 2003). High consumption of sugar sweetened beverages, especially carbonated soft drinks, increases the risk of overweight, obesity (Malik, Schulze, and Hu, 2006), heart diseases as well as tooth decay (Roos and Donly, 2002). They contain high amounts of energy due to high sugar contents in the form of fluid which often do not give satiety in the same way as solid foods do (Brownell et al., 2009; Elfhag et al., 2007; Malik et al., 2006). In the United States of America, one third of the adults are obese which is linked to the consumption of sugar sweetened beverages. Energy intake from the consumption of soft drinks increased by 135% from 1977 to 2001, thus doubling the prevalence of obese adults (Bleich, Claire, Wang, and Gortmaker, 2009).

Soft drinks have become the largest beverage sector worldwide and they are slowly overtaking the hot drinks sector. Since the introduction of soft drinks in the market in 1830, it is difficult to ignore their existence. Instead, they are among the popular products today (Lazim and Hasliza, 2011). The consumption and popularity of soft drinks has been increasing steadily due to increased strong preference to palatable sweet taste, at a reasonably low price (Sartor et al., 2011). In addition the presence of advanced production technologies contribute to this popularity (Lazim and Hasliza, 2011).

Nutritional information on food labels is believed to help consumers make informed food choices. Although consumers may be interested in nutrition labelling, it does not mean that they will use the information (Hoefkens, Verbeke, and Van Camp, 2011). Some other aspects such as taste, price and some nutrients like fat, energy, salt and sugar have been reported to draw more interest from consumers (Hoefkens et al., 2011).

Soft drinks are widely consumed in Nigeria and it is generally believed that they contain large amounts of sugars and therefore calories (Onyemelukwe, Bakari, Ogbadu, 2006).

1.2 Statement of Problem

There are tremendous varieties of foods in European markets including high energy giving foods and drinks that are considered to be the cause of energy intakes above the individual requirements. If the energy intake is higher than expenditure, over a longer period of time an individual gains weight and becomes overweight or obese (Ocke et al., 2009).

A number of studies showed that the consumption of regular (sugar sweetened) soft drinks was linked with a higher prevalence of health problems like childhood obesity and overweight, lower bone mineral density and incidence of multiple metabolic risk factors (Cuco et al., 2003; Dhingra, et al., 2007; Gartland et al., 2003; James et al., 2004; Ludwig et al., 2001; Schulze et al., 2004).

Factors influencing sugar-sweetened beverages consumption across the population include taste, availability, role modeling by significant others, advertising and marketing, and price (Hector et al, 2009; Denney-Wilson et al, 2009). Among adults, social settings are key triggers for consumption. The purchase of fast food and the availability of soft drinks in the home, workplace and other social settings are also leading factors. (Hattersley, Shrewbury, King, Howlett, Hardy, and Baur, 2009). Among children, the availability of sugar-sweetened beverages in the home and taste preferences are the main drivers of consumption and availability of sugar-sweetened beverages in schools is also a key driver (Denney-Wilson et al, 2009).

With the gradual westernization of life styles in Nigeria, there is a gradual increase in the number of soft drink manufacturing companies and the traditional habit of giving water to a visitor is now replaced by either soft drinks or alcohol. Indeed, during hot seasons in the Northern States of Nigeria, many Nigerians may drink more than fifteen bottles of soft drinks a day to combat heat waves (Onyemelukwe , Bakari, Ogbadu, 2006).

However most of these studies focused on the consumption of soft drinks by children and adolescents. Studies focusing on adults are limited, that is why this study found the necessity to

investigate patterns of consumption of soft drinks (SDs) and perception of vulnerability to non-communicable diseases among students of Polytechnic Ibadan, Oyo State. Nigeria.

1.3 Justification

This study will be significant for four reasons: Firstly, result from research will help to identify students who have been taking SDs without knowing the consequences that lead to non-communication diseases. It will go a long way to identify factors contributing to consumption of soft drinks among student of higher institutions.

Secondly, it will serve as an evidence for orientating students of tertiary institution against consumption of SDs and their perception relating to non-communicable diseases as soon as they are admitted into the school.

Thirdly, it will serve as an evidence for making a range of policies that could bring about reduction or abstinence from consumption of SDs in the institution.

Lastly, it will serve as an evidence for planned intervention on intake of SDs among these students. it could be a source of information for international and national nutrition authorities on ideas about how to promote healthy lifestyle.

1.4 Research Questions

This study answered the following research questions:

1. What is the pattern of consumption of SDs among students?
2. What is the knowledge of students on causes of non-communicable diseases?
3. What is the knowledge of students as regard health implication of SDs ?
4. What is the perception of students of health implication of SDs consumption?
5. What are the factors that influence students to consume SDs?

1.5 Objectives of the Study

The broad objective of the study was to investigate pattern of consumption of SDs and perception of vulnerability to non-communicable diseases among students of Polytechnic Ibadan, Oyo State, Nigeria.

The specific objectives were to:

1. To examine the frequency consumption of SDs among students.
2. To assess the students' knowledge of causes of non-communicable diseases.
3. To assess the level of knowledge of health implication of SDs among students .
4. To determine the students' perception of health implication of SDs consumption.
5. To identify the factors that influence the students to consume regular SDs .

1.6 Hypotheses

The following null hypotheses tested was tested by the study:

Hypothesis 1: There is no significant association between frequency of collecting pocket money and pattern of consumption of SDs.

Hypothesis 2: There is no significant association between accessibility to SDs and pattern of consumption of SDs.

Hypothesis 3: There is no significant association between respondents' perception of SDs and pattern of consumption of SDs.

CHAPTER TWO

LITERATURE REVIEW

2.1 Pattern of consumption of soft drinks

Soft drinks have become extremely popular across the globe. There are approximately 200 countries consuming soft drinks. On an estimate, 82.5 litres of soft drinks are consumed per person per year. According to the '2008 Global Soft Drinks' report, America alone represents 25% of the total beverage market energy intake consumption of more than 50 billion litres of soft drinks per year (Zenith International, 2008).

Two large prospective cohort studies found an association between regular consumption of sugar-sweetened soft drinks and the risk of Type 2 Diabetes:

- Compared to women who consumed less than 1 sugar-sweetened soft drink per day, women consuming 1 or more such beverages per day had an 83% increased risk of Type 2 diabetes (Schulze, Manson, Ludwig, Colditz, Stampfer, Willett, Hu, 2004).
- Compared to African American women who consumed less than 1 soft drink per day, African American women who consumed 2 or more soft drinks per day had a 24% increased incidence of Type 2 Diabetes (Palmer, Boggs, Krishnan, Hu, Singer, Rosenberg, 2008).

A 4-year follow up of men and women in the Framingham Heart Study found that those who drank one or more sodas per day were 50% more likely to develop metabolic syndrome (a combination of risk factors, such as high waist circumference, high blood pressure, impaired fasting glucose or diabetes, that strongly predicts the likelihood of developing cardiovascular disease) than those who drank less than one soda per week (Dhingra, Sullivan, Jacques, Wang, Fox, Meigs, D'Agostino, Gaziano, Vasan, 2007).

In the United States alone, the per capita consumption of soft drinks increased from 11 gallons/year to 49 gallons/year. Soft drink consumption in children has increased by 48% in 1998 compared to 1977 (French *et al.*, 2003). In the 70s most soft drinks were made with

sucrose, while from 90s onwards this has been substituted with high-fructose corn syrup. All these put together may have serious effects by playing a critical role in the obesity epidemic (Bray *et al.*, 2004). A major concern about childhood obesity is that the condition is likely to continue in adulthood, with serious risks of related chronic disease conditions (Wright *et al.*, 2001). The major dietary factors positively associated with the probability of developing childhood obesity include, increased consumption of soft drinks, fat, oils and sodium. The most frequently encountered barriers in the management of obesity include consumption of fast food and soft drinks (Perrin *et al.*, 2005).

Heavy consumption of soft drinks has also been implicated as one among the many risk factors for cancer. Changing life style, including the nutrition (soft drinks) at pubertal stage may be one of the factors for the development of breast cancer (Vandeloo *et al.*, 2007). Recent studies have shown that the consumption of soft drinks, and sweetened fruit soups are positively associated with a greater risk of pancreatic cancer (Larsson *et al.*, 2006). Though soft drink consumption has not been found to influence pancreatic cancer risk among men, consumption of sugar sweetened soft drinks has been hypothesized to be associated with a modest but significant increase in risk among women who have an underlying degree of insulin resistance (Schernhammer *et al.*, 2005).

Consumption of soft drinks has increased in western countries over the past 3 decades (Sartor *et al.* 2011). Some studies revealed association between soft drink consumption, weight gain and television viewing these includes; Juan *et al.* (2011) who reported high food and drink consumption during television viewing among adolescents in Belgium, Greece, Hungary and Spain and showed boys had a higher consumption than girls. Brownell *et al.* (2009) reported high daily consumption of sugar sweetened beverages in USA in both adults and children to about 175kcal and 172 Kcal respectively (from data of 2005-2006) leading to increased energy intake from 50 Kcal in 1965 to above 200 Kcal in 2002 (Ventura *et al.*, 2010). Soft drinks are a rich source of sugar and energy, with one regular can containing 10 teaspoons of sugar and 640 kJ (150 cal). But, other than fluid, they provide no nutritional value – only ‘empty’ calories (Jacobson 2005). They are identified as an ‘extra’ food in The Australian Guide to Healthy

Eating (Smith et al 1998) i.e. a food that should be consumed only occasionally or in small amounts. Occasionally has been defined as "once a week or less" by The Communication on Obesity Action for Child Health (COACH) Reference Group (Wilde et al 2007). Regular soft drinks should not form the essential part of the meal and/or can be completely avoided during meals. A moderate intake of light soft drinks can be selected instead. Alternatively water and low-fat milk products can replace sugar-rich soft drinks (Astrup *et al.*, 2008).

Tokunbo, Oluniyi, Adebanke, Ozovehe (2012) conducted a survey among adolescent secondary schools students residing at Ile Ife Osun State, Nigeria. The sample was selected from twelve public and private secondary schools. Findings show that soft drinks were the most consumed (97%) by the participants especially among the females. According to a study of 1000 secondary school Students within the ages of 10 to 20years, soft drink consumption by Nigerian adolescents is increasing. More than 97% of male and female students consumed at least one soft drink a day (Ansa, Anah & Ndifon 2008.)

In many African countries, including Nigeria, individuals who abhor beer and other types of alcohol pride themselves in taking soft drinks and malt drinks. In severe hot weather in the Northern States of Nigeria, some children and adults may drink as many as ten bottles of soft drink a day instead of water; while low income workers, as well as office workers, may drink three bottles or more a day supplemented with leaves of bread. During periods of aggressive promotion by the marketing companies of such drinks, increases in drinking occur as promises of rich rewards are made to the population (Onyemelukwe GC. et al, 2006).

2.2 Knowledge of the causes of non-communicable diseases.

A non-communicable disease (NCD) is a medical condition or disease that is by definition non-infectious and non-transmissible among people. Currently, NCDs are the leading causes of death and disease burden worldwide (Kim and Oh, 2013). Non-communicable diseases (NCDs) are major causes of morbidity and mortality particularly for developing countries. Large proportion of all NCDs deaths are occurring in low- and -middle-income countries are estimated to occur in people under 70-years-old. These low- and middle-income are undergoing epidemiological

transition which allows the concomitant occurrence of both communicable and NCDs due to adoption of western life-style that predisposes them to development of these diseases. It is also known that there are risk-factors that tend to cluster in individuals and make them more susceptible to NCDs especially cardiovascular diseases (Dahiru and Ejembi, 2013).

The four major NCDs featuring prominently include: cardiovascular disease, cancers, chronic respiratory diseases and diabetes mellitus (WHO, 2011). NCDs stem from a combination of modifiable and non-modifiable risk factors. Non-modifiable risk factors refer to characteristics that cannot be changed by an individual (or the environment) and include age, sex, and genetic make-up. Although they cannot be the primary targets of interventions, they remain important factors since they affect and partly determine the effectiveness of many prevention and treatment approaches. A country's age structure may convey important information on the most prevalent diseases, as may the population's racial/ethnic distribution. Modifiable risk factors refer to characteristics that societies or individuals can change to improve health outcomes. WHO typically refers to four major ones for NCDs: poor diet, physical inactivity, tobacco use, and harmful alcohol use (WHO, 2011a). Children, adults and the elderly are all vulnerable to the risk factors that contribute to non-communicable diseases, whether from unhealthy diets, physical inactivity, exposure to tobacco smoke or the effects of the harmful use of alcohol. These diseases are driven by forces that include ageing, rapid unplanned urbanization, and the globalization of unhealthy lifestyles. For example, globalization of unhealthy lifestyles like unhealthy diets may show up in individuals as raised blood pressure, increased blood glucose, elevated blood lipids, overweight and obesity (Lim et al, 2010).

The composition of human diets has changed considerably over time, with globalization and urbanization making processed foods high in refined starch, sugar, salt and unhealthy fats cheaply and readily available and enticing to consumers – often more so than natural foods (Hawkes, 2006; Kennedy, Nantel, & Shetty, 2004; Lieberman, 2003; WHO, 2002). As a result, overweight and obesity, and associated health problems, are on the rise in the developing world (Cecchini, et al., 2010). Exacerbating matters has been a shift toward more sedentary lifestyles, which has accompanied economic growth, the shift from agricultural economies to service-based

economies, and urbanization in the developing world. This spreading of the fast food culture, sedentary lifestyle and increase in bodyweight has led some to coin the emerging threat a “globesity” epidemic (Bifulco & Caruso, 2007; Deitel, 2002; Schwartz, 2005).

Globally, cardiovascular disease account for most death (about 17 million people annually) followed by cancer (7.6 million), respiratory diseases (4.2 million) and diabetes (1.3 million). (Shukla, 2011).

In Nigeria, the impact of NCD is enormous and glaring. NCDs are estimated to account for 27% of all deaths (WHO 2011). About 5 million Nigerian may die of NCDs by the year 2015, and diabetes alone is projected to cause about 52% of the mortality by 2015. Also, the economic cost of NCDs in Nigeria in 2005 was about 400 million dollars from premature death due to NCDs. By 2015, it is estimated to rise to about 8 billion dollars (HERFON, 2011). It is pointed out that about 8 million Nigerians suffer from hypertension and 4 million has diabetes; 100, 000 new cases of cancers are diagnosed each year in Nigeria (Chukwu, 2011). These great losses are not just at an individual’s levels, but also profoundly affect the family and a country’s work force and for the million struggling with poverty, a vicious cycle ensues. Researchers have empirically identified the link between NCDs and globalization, urbanization, demographics, life style transition, socio-cultural factors, poverty, poor maternal, foetal and infant nutrition (Venkat Narayan et al. 2010)

2.3 Knowledge of the health implication of soft drink.

A soft drink is a non-alcoholic beverage that typically contains water, a sweetener, acid and a flavouring agent (Ashurst, 2005). Other ingredients may include fruit or fruit juice, carbon dioxide, preservative and colorants. There are many different types of sweeteners like sugar (sacharose), another major ingredient in soft drinks as it is highly nutritious and is the invaluable carrier of the fruit aromas. It is made from sugar-beet or sugarcane or sweeteners found naturally in many fruits and vegetables. Two simple types of sugar are found in fruits - fructose (fruit-sugar) and glucose (grape-sugar). There are also low-calorie artificial sweeteners like saccharin and aspartame (nutra-sweet). Saccharin, is a non-nutritious sweetener which is extremely sweet,

stable gives no energy (no calories). Aspartame is a nutrient-sweetener built up of two amino-acids, asparagin acid and phenylalanine, it is 200 times sweeter than saccharin (Authur, Johnson and Kumar 2003).

Soft drinks may be caffeinated or non caffeinated; may be served chilled or at room temperature and are rarely heated. These beverages can be categorized as water drinks; carbonates; dilutables, still and juice drinks and functional drinks. Not all beverages are soft drinks. Examples of beverages that are not considered to be soft drinks are: pure juices, hot chocolate, brewed tea and coffee, milk, and milkshakes (Ashurst, 2005). Also, globalization of soft drinks culture (cocacolonisation) has been articulated by Zimmet (2007) and linked with chronic diseases following excessive, persistent consumption of sugary drinks (dietary fructose) which lead to obesity and also adversely affect lipids, platelet adhesiveness, insulin levels (Szanto, Yudkin, 1969).

Table 2.1.0: Sugar contents of soft drinks marketed in Nigeria

Soft drinks	Sugar (g/100ml)			Total
	Glucose	Sucrose	Fructose	
Cocacola	0.22	1.31	0.67	2.2
Fanta	0.42	1.20	0.70	2.32
Sprite	0.20	0.68	0.60	1.48
Pepsicola	0.17	0.81	0.58	1.56
Mirinda	0.22	0.95	0.54	1.71
Maltina	0.22	1.13	0.50	1.85

Source: Onyemelukwe, Bakari, Ogbadu, 2006

Table 2.1.1: Caloric content per bottle of soft drink.

Soft Drink	Volume per bottle (ml)	Total CHO Per bottle	Total calorie from CHO per bottle (Kcal)
Cocacola	350	7.70	30.80
Fanta	290	6.73	26.92
sprite	290	3.29	13.16
Pepsicola	290	4.52	18.08
Mirinda	290	4.96	19.84
Maltina	300	5.55	22.22

- a gram of carbohydrate yields 4 kilo-calories of energy.
- CHO= carbohydrate . 10ml = 1cl

Source: Onyemelukwe, Bakari, Ogbadu, 2006

Onyemelukwe, Bakare and Ogbadu discussed the data above that various soft drinks analyzed contain significant amounts of refined sugars such as glucose, fructose and sucrose which may serve as a source of extra calories. Furthermore, ingestion of high levels of simple sugars on a chronic basis could precipitate glucose intolerance in susceptible individuals. Besides the effect of fructose noted above, large quantities of simple sugars with high caloric intake in soft drinks and malt drinks may lead to and aggravate obesity, a known risk factor for diabetes, hypertension and other non-communicable diseases.

Soft drinks contain high amounts of energy and the ability of the body to compensate energy from carbohydrate consumed in fluid form is less clear than from carbohydrates consumed in solid form. This means that sugar in soluble form may fail to trigger satiety in the same way than solid foods do (Wolff and Dansinger, 2008), thus puts consumers at greater risk of overweight and obesity (Gibson and Neate, 2007; Malik et al., 2006; Vartanian et al., 2007). Soft drinks can also affect the diet quality for example it may displace milk consumption, thus reducing calcium intake from milk which is the main source of calcium, especially in children (French et al., 2003; Harnack et al., 1999).

The most common health effects associated with increased soft drink consumption are obesity, diabetes, tooth decay, osteoporosis and bone fractures, nutritional deficiencies, heart diseases, addictions, eating disorders, neurotransmitter dysfunctions and neurological disorders (Duyff, 2006; Mercola, 2009). Despite nutritional information being available on each can of soft drink, both the young and the old continue to consume many litres of soft drink, irrespective of the fact that soft drinks have no nutritional value, except for its high calorie content (Grimm et al, 2004; Denney-Wilson et al, 2009; Hattersley et al, 2009).

Overweight is a medical condition where the body mass index is between 25 and 29.9 and obesity is a condition where the body mass index is 30 or above (Goedecke, Jennings & Lambert, 2006). Overweight and obesity are the fifth leading risk for global deaths. According to the 2008 WHO report of South Africa, 65% of adults are overweight and 31% are obese.

Obesity is a multifactorial disease. Soft drinks do not cause obesity but is only a significant contributor. The main culprit is the sweeteners found in soft drinks. The sweeteners in soft drinks contain is highly caloric than ordinary sugar and induces physiologic and hormonal responses that lead to weight gain (Mercola, 2009). A meta-analysis of 88 studies showed that increased soft drink intake was associated with increased energy intake and body weight (Vartanian, Schwartz & Brownell, 2007). Consumption of sweetened soft drinks leads to decreased energy expenditure, decreased hunger satisfaction leading to increased food intake and thus contributing to obesity (St-Onge et al, 2003; Vartanian et al 2007).

Consumption of sugar sweetened beverages (SSB) is associated with weight changes in all ages although the mechanism may not be clearly understood (James and Kerr, 2005), especially for those who take one or more drinks per day (Schulze et al., 2004). This is attributed to the excess intake of energy and large amounts of rapidly absorbable sugars. However, there are little effects on weight changes for those who decreased consumption of sugar sweetened beverages (Husoy et al., 2008; Schulze et al., 2004). An increase in BMI was also reported by Ludwig et al. (2001) for every additional serving of sugar sweetened beverage in USA school children. Positive association between increased intake of sugar sweetened beverages (SSBs) and overweight and obesity was also reported by Olsen and Heitmann, (2009), as well as Malik et al. (2006) and Hu and Malik, (2010) through a systematic review of well done cohort studies and Forshee et al. (2008) through meta-analysis study. For adults who decreased intake of SSBs from more than one soft drink per day to less than one per week had a decreased body weight (Bergen and Yeh, 2006).

Drinks with a high sugar content can cause a condition called non-alcoholic fatty liver disease where there is accumulation of fat inside liver cells (Medilexicon Medical Dictionary, 2012). People drinking more than two servings of soft drinks a day have increased chances for a fatty liver, leading to cirrhosis of the liver very similar to that found in chronic alcoholics (Mercola, 2009). Fructose, found in soft drinks is highly absorbable in the liver where it is converted to fat (steatosis). This may induce fatty liver. Even small doses of aspartame which is found in diet

drinks and the preservative sodium benzoate can cause liver cell damage eventually lead to cirrhosis of the liver and various other conditions (Byrne, 2011).

Soft drinks consumption of more than one drink a day was linked to a higher prevalence of multiple metabolic risk factors like obesity, impaired fasting glucose, high blood pressure, more waist circumference and low density lipoprotein cholesterol (Dhingra, et al., 2007). Also triglyceride deposition in the liver, insulin resistance and kidney stones (Ventura et al., 2010), rise in serum uric acid levels (Choi, et al., 2008) due to high fructose intake from SSB. Fructose 12 is believed to cause an increase in uric acid levels leading to a condition called hyperuricemia resulting to gout disease, an inflammatory arthritis in adult men, (Choi, et al., 2008). High consumption of soft drinks is linked to the increase of coronary heart disease (Fung et al., 2009), low mineral density in adolescent girls (Gartland et al., 2003) and Caffeine in the soft drinks causes the release of adrenaline which is accompanied by a rise in blood sugar. The pancreas then reacts by secreting insulin which lowers blood sugar levels by pushing sugar into cells for oxidation and energy production. Excess sugar is then stored as fat. A can of soft drink contains about 10 teaspoons of sugar. Thus, excessive consumption exceeds the WHO recommended 10% limit of calorie intake from added sugars, causing a sustained increase in blood sugar level specifically type II diabetes. Sugar causes the clumping of red blood cells. This obstructs the flow of delivering oxygen to the cells and removing carbon dioxide from the cells. The result is a detrimental build-up of wastes (Vartanian et al, 2007; Mercola, 2009).

Hypertension is a chronic medical condition where there is an elevated blood pressure in the arteries (Medilexicon Medical Dictionary, 2012). The following mechanisms have been suggested to explain how soft drinks can cause high blood pressure i) Obesity which is an outcome of increased soft drink intake puts the heart under great strain to pump enough blood thus predisposing to hypertension. ii) The glucose and fructose from the beverages increase levels of uric acid in the blood interfering with blood vessels' ability to dilate and expand, thus causing a rise in pressure. iii) Excess sugar from the soft drinks causes the body to retain more water, and can also increase blood pressure. iv) The sugar in the drinks may also increase levels of catecholamine hormones, which can cause blood pressure to rise (Mercola,2009; Park,2011).

The American Heart Association recommends that soft drink consumption be restricted to no more than three 355 ml cans of soda a week (Vartanian et al, 2007; Brown et al, 2011).

Higher prevalence of the metabolic syndrome poses a greater risk for cardiovascular disease. Individuals with greater intake of soft drinks typically have unhealthy diets, and a sedentary life. Larger consumption of sweeteners found in soft drinks can lead to weight gain, increased insulin resistance, a lowering of high density lipids and an increase in triglyceride levels. The caramel content of soft drinks can also promote insulin resistance and can be “proinflammatory”. Caffeine in the drinks blocks neurotransmitter receptor sites in the central nervous system causing constriction of the cerebral arteries, rapid heartbeat, high blood pressure, and excessive excretion of urine (Dhingra et al, 2007; Vartanian et al, 2007; Mercola, 2009).

Some of the artificial sweeteners used such as saccharin have been shown to have carcinogenic effect in humans. Among the different types of cancer found in humans, pancreatic cancer is the most likely to be attributed to soft drinks. People who drink two or more sweetened soft drinks a week may have a higher risk of pancreatic cancer. The high levels of sugar in soft drinks increase the level of insulin in the body which is produced in the pancreas. Rising insulin promotes pancreatic cancer cell growth. The caramel coloring in the soft drinks also is a cancer-causing agent. The metabolic product of aspartame, formaldehyde over time gets accumulated and is carcinogenic (Vartanian et al, 2007; Leap & William, 2009 ; Mercola, 2009).

2.4 Perception of health implication of soft drinks consumption

Consumption of energy dense foods especially sweetened beverages like fruit drinks, carbonated soft drinks and energy drinks may lead to type 2 diabetes and cardiovascular risk (Hu & Malik , 2010). Unhealthy diets are one of the primary modifiable risk factors associated with NCDs and account for 2.7 million deaths annually (WHO, 2009). Diets high in intake of foods such as burgers, pizzas, red meats, crisps, biscuits, salty snacks, sugary drinks that contain high levels of sugar, salt, trans-fats and saturated fats are known to pose a greater risk for obesity and NCDs(Tokunaga et al., 2012) Most of these foods are ultraprocessed (Rob Moodie et al., 2013).

Global food promotion, marketing and advertising are closely linked with globalization, leading to dietary transitions towards unhealthy foods. The aim of food marketing is to increase demand for products by making people develop the habit of consuming the product regularly. In order to cater to some rural areas and low-income populations, soft drink companies have invested in smaller bottles at lower prices to create acceptability of the product. In other places, portion sizes are increased to encourage greater consumption (Barry et al., 2012) at an individual level, increased purchasing power and the convenience of ready-to-eat products promote the consumption of unhealthy foods. (Rob Moodie et al., 2013)

2.5 Factors influencing soft drinks consumption

❖ personal factors

- a. Age, race, gender: The type, amount and frequency of consumption of soft drinks varies with increasing age. As children get older, consumption patterns changes with a greater liking towards these sweetened drinks than nutritious drinks like milk. Boys were found to drink more beverages than girls. Boys tend to consume more of carbonated beverages while girls consumed fruit juices, still drinks and diet drinks. Globally, on an average Hispanics and blacks consume more soft drinks than whites (Forshee et al, 2003; Grimm et al, 2004).
- b. Preference: Preference for the taste of soft drinks is the strongest predictor for soft drink consumption. As preference for the taste increases, so does the amount of soft drinks consumed. The caffeine and the sugar content of soft drinks promote the preference towards soft drinks in adolescents. The type of soft drink preferred differs from one individual to another. Preference may also vary upon factors like age, gender and knowledge. Older children may prefer carbonated beverages while younger children may prefer fruit juices or squashes. Boys may prefer regular carbonated drinks while girls may prefer diet drinks or still drinks like iced tea. Sometimes, excessive parental restriction placed on a child's soft drink consumption can actually lead to its increased preference (Grimm et al, 2004; Gour, Srivastava & Adhikari, 2010).
- c. Knowledge: Knowledge plays a crucial part in one's decision to consume, not to consume or even restrict consumption of a product. Adolescents who are ignorant or confused about the

implications of soft drinks on health are more likely to consume soft drinks. A study by Temple, Steyn, Myburgh & Nel (2006) in Cape Town showed that learners did not have correct knowledge if the foods they consumed were healthy or unhealthy. However, learners attending schools of higher status had better knowledge on healthy and unhealthy foods and had better dietary practices. Therefore, knowledge is also linked to the socio-economic status of the parents (Cunningham & Marshall, 2003; Ward, 2009).

❖ SOCIO-ENVIRONMENTAL FACTORS

a. Easy availability of soft drinks: The school and home environment are the easiest sources of soft drinks for learners since they spend a substantial amount of time here. Unless the food environment is healthier, unhealthy dietary choices like soft drinks will be opted for. More availability of soft drinks in homes also mean no or relaxed restrictions leading to greater consumption. In the school environment, vending machines and the school tuck shops provide soft drinks very easily. Greater opportunities to drink sweetened beverages would result in increased intake (Cullen & Zakeri, 2004). Shops in the near radius of schools and the homes are the next easy sources for soft drinks. Learners travelling to and from school by foot can easily access these shops (Grimm et al, 2004; Fernandes, 2008).

b. Soft drink consumption of family and friends: Parental and peer influence play a pivotal role in adolescent soft drink consumption behaviour. Sometimes, parental influence may be greater and vice versa. Parents, a role model for children may influence them both positively and negatively. Those parents who consume soft drinks on a regular basis may be less strict about their children's soft drink consumption compared to parents who place restriction. However, there may be a dilemma sometimes as restriction may cause increased preference. Adolescents with a high level of agreeableness or who may want to "fit in" will be likely to consume more soft drinks. Taste preferences and soft drink purchasing habits of parents can also influence beverage consumption of children (Grimm et al, 2004; Patrick & Nicklas, 2005; de Bruijn et al, 2007, Wouters et al, 2010). Sweetened beverages can also be consumed as snacks at friends' homes or in fast-food restaurants. Grimm et al (2004) reported that 80% of children stated that carbonated soft drinks were readily available in the home and if

parents regularly drank carbonated soft drinks, children were almost “three times more likely to consume carbonated soft drinks five or more times per week”. This was also linked to parental education. Children belonging to families with less parental education were more likely to have relaxed restrictions on the consumption of soft drinks (Nilson, Krokstad, Holmen & Westin, 2010).

c. Fast food purchasing habits of the learners: Fast food purchases will be almost always accompanied by soft drink purchases. Frequent visits to the fast-food outlets would then lead to greater soft drink intake (Grimm et al, 2004; Patrick et al, 2005; de Bruijn et al, 2007).

d. Influence of advertising on soft drink consumption: Heavy marketing strategies are carried out to promote soft drinks. These ads are in such a way so as to be visually appealing to the viewers. Greater television viewing means greater viewership of these soft drink advertisements. These ads are often endorsed by celebrities with catchy themes making it very attractive especially to children. Moreover, these soft drinks are often conveniently priced such that it is easily affordable (Grimm et al, 2004; Patrick et al, 2005; de Bruijn et al, 2007).

❖ BEHAVIORAL FACTORS

a. Frequent snacking habits of the learners: Snacking can be healthy (like nuts, fruits) or unhealthy (like cookies, chocolate, chips, soft drinks). With the increase of convenient eating, many proper meals have been replaced by snacks mostly unhealthy. Unhealthy snacking has been on the rise especially among children and adolescents. In schools where proper and tasty meals are not available, unhealthy snacking is widely found among learners. Out of these, soft drinks are definitely the most consumed. Boys tend to snack more than girls (Kim, Han, Song & Lee, 2011).

b. Meal skipping habits of the learners: Skipping meals are associated with frequent snacking. Breakfast is the most widely skipped meal especially in adolescent girls. Skipping of meals lead to slower metabolism and a drop in blood sugar. This is often compensated for

by overeating later on in the day and greater intake of snacks which may include soft drinks. Since these sweetened beverages have less hunger satisfying effects, it may lead to even more intake (Verzeletti, Maes, Santinello & Vereecken, 2010).

c. Family meals: Sitting down for a proper family meal around the table would mean intake of more nutritious food and less intake of unhealthy foods like soft drinks as restrictions would be placed on them. More family meals create a positive health environment with higher intake of fruits, vegetables and grains (an increase in essential nutrients). Children would also be encouraged to follow healthy dietary practices (Madani et al, 2008; Verzeletti et al, 2010).

d. Television viewing habits of the learners: Television (TV) watching, working on the computer and video games replaces more physical activities. There would be an increased dietary intake by eating during viewing time. Studies have shown that eating in front of the TV or the computer was associated with lower fruit, vegetable, intake and increased intake of unhealthy snacks (Caroli et al, 2004; Sherry, 2005).

e. Level of physical activity of the learners: Sedentary behaviour is associated with longer hours of TV or computer viewing with greater unhealthy food intake (Grimm et al, 2004; de Bruijn et al, 2007). On the other hand, children who are physically active are more obliged to look after their health and will refrain from sweetened beverages. They would prefer healthier beverage options.

2.6 CONCEPTUAL FRAMEWORK

The conceptual framework will be based on the Health Belief Model. According to Ross and Mico (1980), the model was propounded by Kurt Lewin and further developed by Rosenstock in the 1950s. It attempts to explain preventive health behaviour, particularly the relation of health behaviour to utilization of health services. It addresses an individual's perception of the threat posed by a health problem (susceptibility, severity), the benefits of avoiding the threat and factors influencing the decision to act (barrier, cues to action and self-efficacy). Simply put, the authors adduced that people's belief about whether or not they are susceptible to disease and their perception of the benefits of trying to avoid it influences their readiness to act.

Six main constructs influence people's decision about whether to take action, to prevent, screen for and control illness. In other words, people are ready to act if they:

- believe they are susceptible to the condition (perceived susceptibility)
- believe the condition has serious consequences (perceived severity)
- believe taking action would reduce their susceptibility to the condition or its severity (perceived benefit)
- believe cost of taking action (perceived barriers) are outweighed by the benefits
- are exposed to factors that prompt action (e.g., mass mobilization) (cue to action)
- are confident in their ability to successfully perform an action (self-efficacy)

The perception will depend on the level of knowledge about the health problem—the modifying factor will include the demographic, socio-psychological and structural variables that will be used. This modifying factor will impinge on the level of knowledge and also awaken or subdue the threat to take recommendation action. Modifying factors will enable individuals to evaluate the outcome expected in relation to the constraints. Where the benefits clearly outweigh the constraints, individuals will be motivated to take recommended action. (National Institution of Health, 2005).

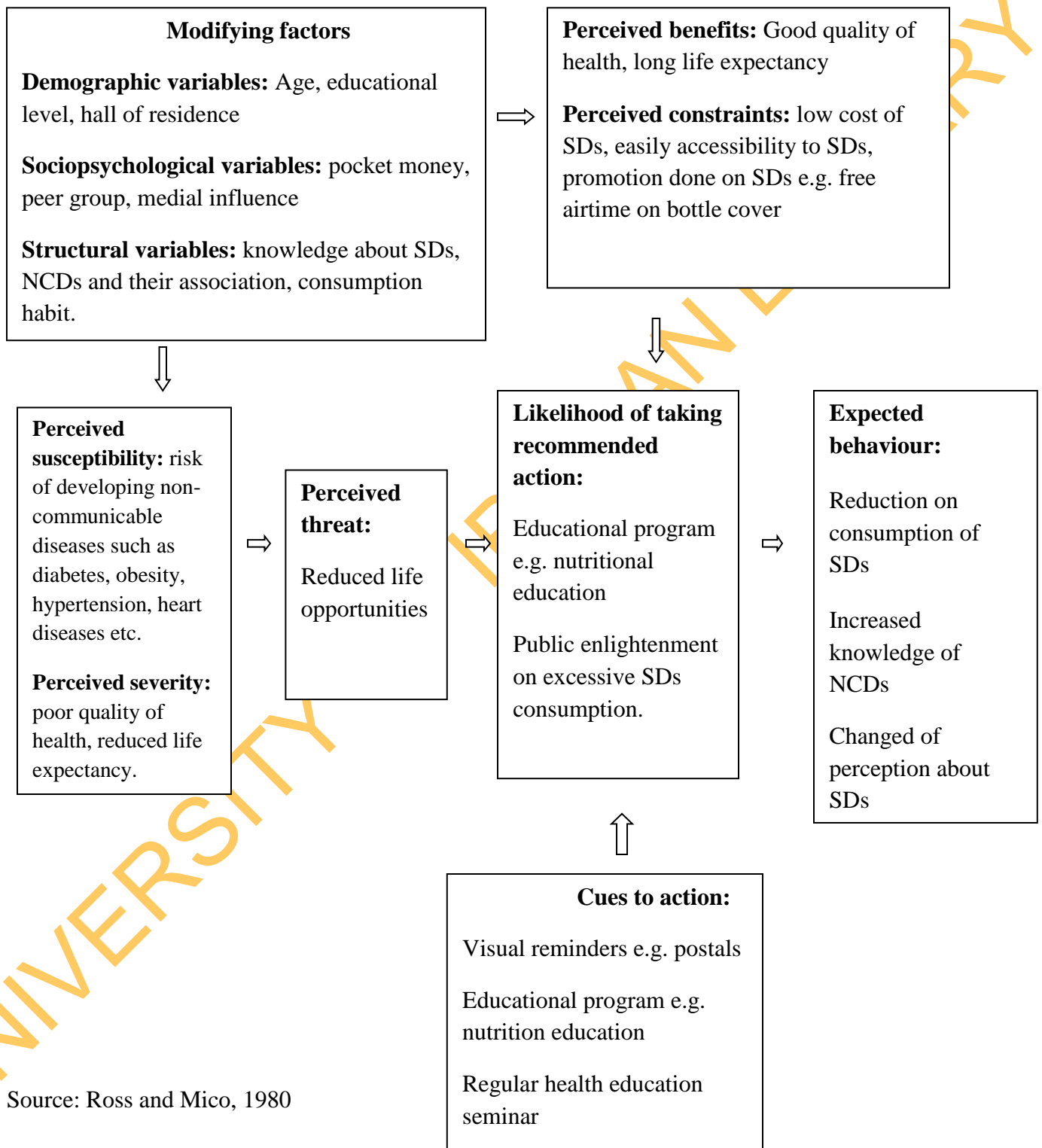
Therefore, in a situation where people believe that SD is good for consumption, they may find it difficult to reduce the level of intake of SDs unless they perceive themselves to be prone to developing some health complications (perceived susceptibility) such as diabetes, cancer,

cardiovascular disease and chronic respiratory disease which may arise as result of too much consumption of SDs.

Other factor that will determine an individual's likelihood of drinking SDs will depend on modifying variables like age, marital status, educational level, knowledge about SDs consumption and non-communicable diseases as well as availability, accessibility of resources and facilities. Also things that can hinder the likelihood of taking action to reduce SDs are high cost of SDs, no easily accessibility to SDs, no promotion done on SDs e.g. airtime on bottle cover.

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Figure 2.1. The health belief model applied to soft drinks (SDs) consumption and perception of vulnerability to non-communicable diseases



Source: Ross and Mico, 1980

CHAPTER THREE

METHODOLOGY

This chapter begins with the description of the study design, study location, study population, study variables both dependent and independent, sample size, sampling technique, instrument for data collection, data collection procedure, validity of instrument, reliability of instrument, pre-testing of instrument, data analysis and ethical consideration.

3.1 Study Design

This study was a descriptive cross-sectional survey which was set out to determine the perception of vulnerability to the development of non-communicable diseases as a result of regular soft drinks consumption among student of The Polytechnic Ibadan.

3.2 Study Location

The study was carried out in the Polytechnic Ibadan, Ibadan, Oyo State established in 1970. It is the first technical institute in Nigeria. The Polytechnic also offer a wide range of specialized short courses not only for the purpose of improving the vocational competence of technical and commercial workers, but also to provide an opportunity for presenting the most recent advances in knowledge and in techniques to specialist groups. It also provides opportunity for creative development and research related to the needs of teaching and industry and the business community, particularly in its service area. The polytechnic has been producing majorly middle level manpower that has been making valuable contributions to the social and economic development of the country. It has three campuses; the main campus in Ibadan and other two satellite campuses at Eruwa and Saki in Oyo State. Each of the campus is headed by a Director who is responsible to the Rector of Administration and Discipline of the School.

The Polytechnic of Ibadan runs mainly National Diploma (ND) and Higher National Diploma (HND). In 1975/76 session, the polytechnic adopted the faculty system of structuring the academic departments. At present, there are five faculties namely: Engineering, Science,

Environmental Studies, Financial and Management Studies, and Business and Communication Studies. It has four halls of residence namely Orisun, Ramat, Unity and Olori.

3.3 Study Population

The study population focuses on the students of The Polytechnic Ibadan residing within the various halls of residence.

3.4 Sample size calculation

The sample size (n) was determined by using Lwanga and Lemeshow (1991) sample size formula:

$$n = \frac{Z^2 pq}{d^2}$$

Where n= minimum sample size required

Z = confidence limit of survey at 95% (1.96)

P = expected prevalence = 50% = 0.50

q = 1-p = 1-50% = 50% = 0.50

d = absolute deviation from true value (degree of accuracy) = 5% = 0.05

$$n = \frac{1.96^2 \times 0.50 \times 0.50}{0.05^2}$$

n = 384

The sample size was 422 (i.e 384 + 38(10% of the calculated sample size) to take care of attrition, no response and to promote generalization of findings.

3.5 Sampling Technique

A four-stage sampling technique was used in selecting respondents for the study. The stages are as follow.

Stage 1:

All the four hall of residence were used in selecting the study participants. The number of students recruited for each sex was determined proportionately based on student's population in each hall of residence.

- Total population of all students in the halls of residence was 2168 during 2014/2015 session.
- Population of male students in the hall of residence was 224
- Population of female students in the hall of residence was 199

$$\text{Male division} = \frac{\text{Population of male in the hall of residence}}{\text{Total population of students in all the hall of residence}} \times \frac{\text{Sample size}}{1}$$

$$\text{Female division} = \frac{\text{Population of female in the hall of residence}}{\text{Total population of students in all the hall of residence}} \times \frac{\text{Sample size}}{1}$$

(See table 3.1)

Stage 2:

All the blocks in each hall of residence were selected

Stage 3:

Rooms were systematically selected in each block using tables of random numbers. Number of room selected in each hall was based on the number of students to be selected (proportionately) in each hall such that the number of room selected was equal to the number of participants selected.

Stage 4:

A study participant was recruited for each room selected. Simple balloting procedure was used to select a participant if there were more than one student in the room at the time of visit (See table 3.1)

Table 3.1: Distribution of selected respondents

Distribution of selected respondents					
Hall of residence	Hall type	Number of students in the hall	Number of blocks in each hall	Number of rooms in each hall	Number of respondents selected in each hall
Ramat	Female	637	7	270	$\frac{637}{2168} \times \frac{422}{1} = 124$
Olori	Female	384	4	192	$\frac{384}{2168} \times \frac{422}{1} = 75$
Unity	Male	497	6	288	$\frac{497}{2168} \times \frac{422}{1} = 97$
Orisun	Male	650	5	187	$\frac{650}{2168} \times \frac{422}{1} = 127$
Total		2168	22	937	423

3.6 Eligibility criteria

- ❖ Inclusion criteria: study participants were students of The Polytechnic Ibadan who reside in one of the halls of residence in the school.
- ❖ Exclusion criteria: Anybody not fulfilling the inclusion criteria stated above.

3.7 Instrument for data collection

An observational checklist was used to check for accessibility of soft drink outlets (see appendix I) within the hall of residence and a self administered, semi structured questionnaire was used for the survey. The design of the questionnaire was based on the research objectives, review of literature, and guidance of research supervisor. There were a total of 48 questions and these were divided into six (6) sections. The first section generated information on the socio-demographic data of the respondents; the second section documented pattern of consumption of SDs; the third section assessed respondents' knowledge of the causes of non-communicable diseases; the fourth section also assessed their knowledge of health implication of SDs; the fifth section explored the respondents' perception about SDs; the sixth section identified factors that influence SDs (See appendix II).

3.8 Validity of instrument

Validity describes the ability of an instrument to measure what it is expected to measure while was achieved through consultation of relevant literature and previous research works to develop relevant questions. Secondly, the questionnaire was reviewed several times by the supervisor who had a wealth of the experience on this field for the content and structure validity and finally, the questionnaire was pre-tested.

3.9 Reliability and Pre-testing of Instrument

Reliability describes the accuracy or precision of a research-measuring instrument. Cronbach's Alpha model technique was employed for the reliability of the questionnaire. This was done by self-administering the questionnaire once to about 10% equivalent of the study participants at the site chosen for the pre-test and subsequently the reliability coefficient of 0.77 was obtained, higher than the average correlation coefficient of 0.5 thus showing that the instrument was very

reliable. The outcome of the pre-test was used to correct and modify questions not adequately or appropriately answered by the respondents.

The instrument was pre-tested among the undergraduate students of University of Ibadan, Oyo State and collected within a 3-day period. After the pre-test, appropriate modifications were made to the instrument based on the results from the pre-test.

3.10 Data collection procedure

The accessibility of soft drink outlets was done within the four hall of residence. The administration of the questionnaire was done by the researcher with the help of four (4) research assistants; two females and two males. The questionnaire was self administered since the research participants could read and write in English language. They were distributed at the hall of residence in evening after lectures period between the hours; 4:30pm and 6:30pm for six days. Every room selected for the data collection was visited. Consent of the participants was sought before distribution of the questionnaire by explaining to them the purpose of the research, time to be spent, the benefits of the research as well as the incentives (a sachet of detergent) to be given. Students who are not willing to participate will be exempted from the study and will be replaced with other willing students from adjoining rooms. The questionnaires were retrieved immediately from the respondent after completion and checked for completeness.

3.11 Data management and analysis

The questionnaires were serially numbered for control and recall purposes. It was checked for completeness and accuracy on a daily basis. It was also sorted, edited and coded manually by the researcher with the use of coding guide. The data were imputed into the computer and the analysis was carried out with the use of statistical method. Frequency count were run to detect the missing cases while the data also undergo cleaning. Descriptive statistics and inferential statistics (Chi-Square) were used for the analysis.

3.12 Ethical consideration

Verbal informed consent was obtained from respondents before administering questionnaires. Ethical issues like confidentiality, opportunity to decline interview at any stage and non explosive to risk was also discussed with each respondents. Introduction letter from the department was taken to the student affairs unit and an interactive section with the head of student affairs took place before another introduction letter was obtained from them and taken to the four supervisors of the hall of residence before distribution of the instruments; 2 male and 2 female research assistants were trained to assist in distribution and retrieval of questionnaire. The data was collected in hall of residence and it was self- completed. No identifier such as name of respondents was required and all information was kept confidential. Respondent's verbal informed consent was obtained after provision of adequate, clear and complete information about what the study entails. Respondents who refused to participate in the study were not coerced into the study. Completed questionnaires were kept in secured place where no other person would have access to the information obtained from respondents. All information was used for research only.

Confidentiality of data: In order to assure respondents of confidentiality of the information that were supplied, names of respondents were not required, only identification number was assigned to the questionnaire for proper recording.

Translation: The official language in The Polytechnic Ibadan is English, thus, questionnaire was not translated to respondents' native language.

Beneficence of participants: The outcome of the research will be of benefit not only to the participants, but other students as it will help the institution in orientating against consumption of soft drinks for healthy lifestyle.

Non-maleficence to participants: The research does not require collection of invasive materials. Therefore, safety of the participants is guaranteed.

Voluntariness: The participants had the full detail concerning the research before taking part in it so as to ensure that he/she fully understand the research and willing to take part in it.

3.13 Limitation of the study

This study excluded students of The Polytechnic Ibadan who did not reside in the hall of residence; therefore findings may not be a reflection of the phenomenon among all students of The Polytechnic Ibadan since many of them live outside campus.

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CHAPTER FOUR

RESULTS

The results are presented in this chapter. It consists of six sections as follows:

- Socio-demographic characteristics
- Pattern of consumption of soft drinks
- Knowledge of the causes of non-communicable diseases
- Knowledge of the health implication of soft drinks
- Perception of health implication of soft drinks consumption
- Factors that influence soft drinks consumption

4.1 Socio-Demographic Information

Many of the respondents' sex (53.0%) were males, age of respondents' ranged from 17 to 30 years with a mean of 23.1 ± 3.3 years and few of respondents (36.9%) fell between 23 to 25 years. Large percentages (96.0%) were single. The level of study of respondents ranged from ND1 to HND2, many (56.5%) were Christians while (4.0%) were traditional. The entire four hall of residence within The Polytechnic were represented in the study, few of the respondents (39.0%) do collect pocket money weekly while (38.3%) of respondents collect monthly and (22.7%) of respondents collect daily (see details in table 4.1a and 4.1b below).

Table 4.1a : Sex, Age, Marital status, Level of study, Religion, Hall of residence, How often do you collect pocket money?

S/No	Socio-demographic information	Frequency	Percentage
	Sex		
	Male	224	53.0
	Female	199	47.0
	Total	423	100.0
	Age (yrs)		
	17-19	51	12.1
	20-22	119	28.1
	23-25	159	36.9
	26-28	89	21.0
	29-31	8	1.9
	Total	423	100.0
	Marital Status		
	Single	406	96.0
	Married	17	4.0
	Total	423	100.0
	Level of Study		
	ND 1	81	19.1
	ND 2	99	23.4
	HND 1	145	34.3
	HND 2	98	23.2
	Total	423	100.0

Table 4.1b : Sex, Age, Marital status, Level of study, Religion, Hall of residence, How often do you collect pocket money?

S/No	Socio-demographic information	Frequency	Percentage
	Religion		
	Christianity	239	56.5
	Muslim	167	39.5
	Traditional	17	4.0
	Total	423	100.0
	Hall of Residence		
	Ramat	75	17.7
	Olori	124	29.3
	Unity	97	22.9
	Orisun	127	30.1
	Total	423	100.0
	How often do you collect pocket money?		
	Daily	96	22.7
	Weekly	165	39.0
	Monthly	162	38.3
	Total	423	100.0

4.2 Pattern of consumption of soft drinks (SDs)

SDs consumption was documented among the respondents result shows that many of respondents (59.8%) consumed (35cl) bottles of SD at a single time while (9.9%) did not consume it, some (48.9%) of respondents consumed SD in the last twenty-four hours, more than half (53.0%) of respondents take one 50cl bottle of SD daily on average. Few (29.8%) of respondents usually take SD with meal, majority (76.4%) of respondents have easy access to SD (see details in table 4.2a and 4.2b)

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Table 4.2a : Pattern of consumption of soft drinks (SDs)

S/No	Variable	Number	Percentage
	At a single time, how much SDs can you consume?		
	35cl bottle	253	59.8
	50cl bottle	113	26.7
	2 bottles of 50cl	10	2.4
	1 litre bottle	5	1.2
	No, I don't take it	42	9.9
	Total	423	100.0
	Have you taken any SDs in the last 24hours?		
	Yes	207	48.9
	No	216	51.1
	Total	423	100.0
	How many bottle of SD (50cl) do you take daily on average?		
	One bottle	224	53.0
	Two bottles	123	29.1
	Three bottles	34	8.0
	No, I don't take it	42	9.9
	Total	423	100.0

Table 4.2b : Pattern of consumption of soft drinks (SDs)

S/No	Variable	Number	Percentage
When do you usually take SD?			
	When feeling thirsty	59	13.9
	When you visit friends	45	10.6
	With meals	69	29.8
	After meals	16	3.8
	With snacks	68	16.1
	After lecture	25	5.9
	Without any reason	15	3.5
	Not specific	126	16.3
How accessible is SD to you?			
	Easily access	323	76.4
	Not easily access	100	23.6
	Total	423	100.0

4.3 knowledge of the causes of non-communicable diseases

A large percentage of the respondents (75.7%) believed non-communicable diseases are diseases which is one of the key points while (23.4%) of respondents were able to define non-communicable diseases as diseases that cannot be transmitted from one person to another. Majority (72.8%) of respondents mentioned one example of non-communicable diseases while (19.6%) were able to give two examples. Many (57.2%) of respondents gave one cause out of two causes of non-communicable diseases while few (30.5%) of respondents gave two causes. Majority of the respondents (74.9%) did not know that intake of SDs lead to non-communicable diseases. A large percentage of respondents (70.7%) believed that non-communicable diseases are restricted to the rich. Majority (71.2%) of respondents believed that non-communicable diseases are restricted to only adult. About (60.8%) of respondents were not of view that large proportion of all non-communicable diseases deaths are occurring in low and middle income country e.g. Nigeria. Majority of respondents (71.6%) were also not of the view that not all non-communicable diseases are curable. About (67.4%) of the respondents did not believed that most non-communicable diseases span over a long period of time and can only be managed (see table 4.3a and 4.3b).

Knowledge score for the non-communicable diseases was calculated for each respondent using a 12-point knowledge scale. Each correct answer had a point score of 1 and wrong answer or no response had a point score of 0 and the open ended questions had a point score of 2. The scores were summed up to give a composite point score for each respondent. Knowledge score were also allotted to each respondent in order to know if they have poor (0-6) and good (>6) knowledge. Majority of the respondents (65.0%) had poor knowledge while (35.0%) had good knowledge (see Fig 4.1).

Table 4.3a : Knowledge of the causes of non-communicable diseases

S/No	Variable	Number	Percentage
What are non-communicable diseases?			
	No response-(0pt)	4	0.9
	One key point is mentioned from the definition (disease, cannot be transferred from one person to another)-(1pt)	320	75.7
	Two key points are mentioned from the definition (disease, cannot be transferred from one person to another)-(2pts)	99	23.4
	Total	423	100.0
Give two examples of non-communicable diseases			
	No response - (0pt)	32	7.6
	One of the examples is mentioned (diabetes mellitus, cancer, cardiovascular diseases, chronic respiratory diseases) - (1pt)	308	72.8
	Two examples are mentioned (diabetes mellitus, cancer, cardiovascular diseases, chronic respiratory diseases) - (2pts)	83	19.6
	Total	423	100.0
Give two causes of non-communicable diseases			
	No response - (0pt)	52	12.3
	One of the causes is mentioned (unhealthy diet, physical inactivity, harmful use of alcohol, tobacco use, genetic makeup, obesity) - (1pt)	242	57.2
	Two of the causes are mentioned (unhealthy diet, physical inactivity, harmful use of alcohol, tobacco use, genetic makeup, obesity) - (2pts)	129	30.5
	Total	423	100.0
Can intake of SDs lead to non-communicable diseases?			
	Yes	106	25.1
	No	317	74.9
	Total	423	100.0

Table 4.3b: Knowledge of the causes of non-communicable diseases

S/No	Variable	Number	Percentage
	Are non-communicable diseases restricted to the rich?		
	Yes	299	70.7
	No	124	29.3
	Total	423	100.0
	Are non-communicable diseases restricted to only old adult?		
	Yes	301	71.2
	No	122	28.8
	Total	423	100.0
	Large proportion of all non-communicable diseases deaths are occurring in low and middle income country e.g. Nigeria		
	Yes	166	39.2
	No	257	60.8
	Total	423	100.0
	Not all non-communicable diseases are curable		
	Yes	120	28.4
	No	303	71.6
	Total	423	100.0
	Most non-communicable diseases span over a long period of time and can only be managed		
	Yes	138	32.6
	No	285	67.4
	Total	423	100.0

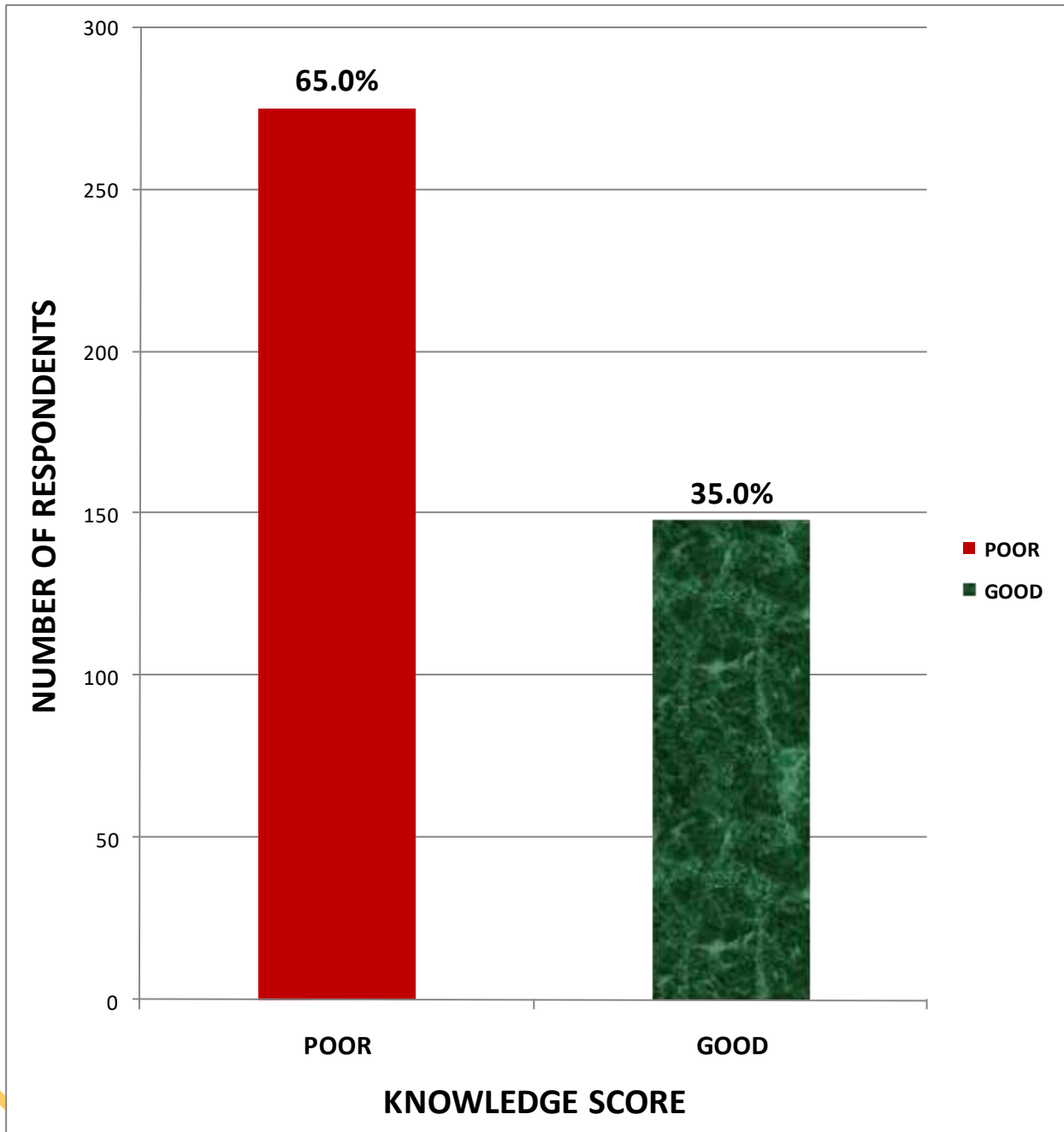


Fig. 4.1: knowledge of the causes of non-communicable diseases

4. 4 Knowledge of health implication of soft drinks (SDs)

Majority of respondents (72.3%) were able to give two examples of SDs while (27.7%) gave one example of it. Majority (84.4%) mentioned one disease that can result from excessive intake of SDs while (10.2%) were able to mention two diseases. A large percentage of respondents (75.4%) named one organ that can be affected negatively from excessive intake of SDs while (2.4%) were able to name two organs. Majority of respondents (64.3%) were able to give the major nutrient from SDs. Large percentage (77.3%) of the respondents knew that SDs add to weight, about (29.3%) said excessive sugar from SDs cause the body to retain more water. (See details in table 4.4a and 4.4b)

Point score was calculated for each respondent using a 9-point knowledge scale which includes open ended questions; some carries 2 point score while one had 1 point score also, close ended questions had a point score of 1, wrong answer or no response had a point score of 0. The scores were summed up to give a composite point score for each respondent. Knowledge score were also allotted to each respondent in order to know if they got poor (0-5) and good (>5) knowledge. Majority of the respondents (60.0%) had good knowledge while some (40.0%) had poor knowledge (See fig 4.2).

Table 4.4a : Knowledge of health implication of soft drinks (SDs).

S/No	Variable	Frequency	Percentage
Give two examples of SDs			
	One of the SDs (coca-cola, fanta, sprite, pepsi, mirinda, 7up, maltina etc) is mentioned – (1pt)	117	27.7
	Two of the SDs (coca-cola, fanta, sprite, pepsi, mirinda, 7up, maltina etc) are mentioned – (2pts)	306	72.3
	Total	423	100.0
Mention two diseases that can result from excessive intake of SDs			
	No response – (0 pt)	23	5.4
	One disease (diabetes, cancer, cardiovascular diseases, chronic respiratory diseases) is mentioned – (1pt)	357	84.4
	Two diseases (diabetes, cancer, cardiovascular diseases, chronic respiratory diseases) is mentioned – (2 pt)	43	10.2
	Total	423	100.0
Name two organs that can be affected negatively from excessive intake of SDs			
	No response – (0pt)	94	22.2
	One of the organs are mentioned (pancreas, heart, kidney, liver, reproductive organ etc) – (1pt)	319	75.4
	Two of the organs are mentioned (pancreas, heart, kidney, liver, reproductive organ etc) – (2pts)	10	2.4
	Total	423	100.0
List the major nutrient you can get from SDs			
	No response – (0pt)	151	35.7
	Carbohydrate (sugar) – (1pt)	272	64.3
	Total	423	100.0

Table 4.4b : Knowledge of health implication of soft drinks (SDs).

S/No	Variable	Frequency	Percentage
	Does SDs add to weight gain?		
	Yes	327	77.3
	No	96	22.7
	Total	423	100.0
	Does excessive sugar from SDs cause the body to retain more water?		
	Yes	299	29.3
	No	124	70.7
	Total	423	100.0

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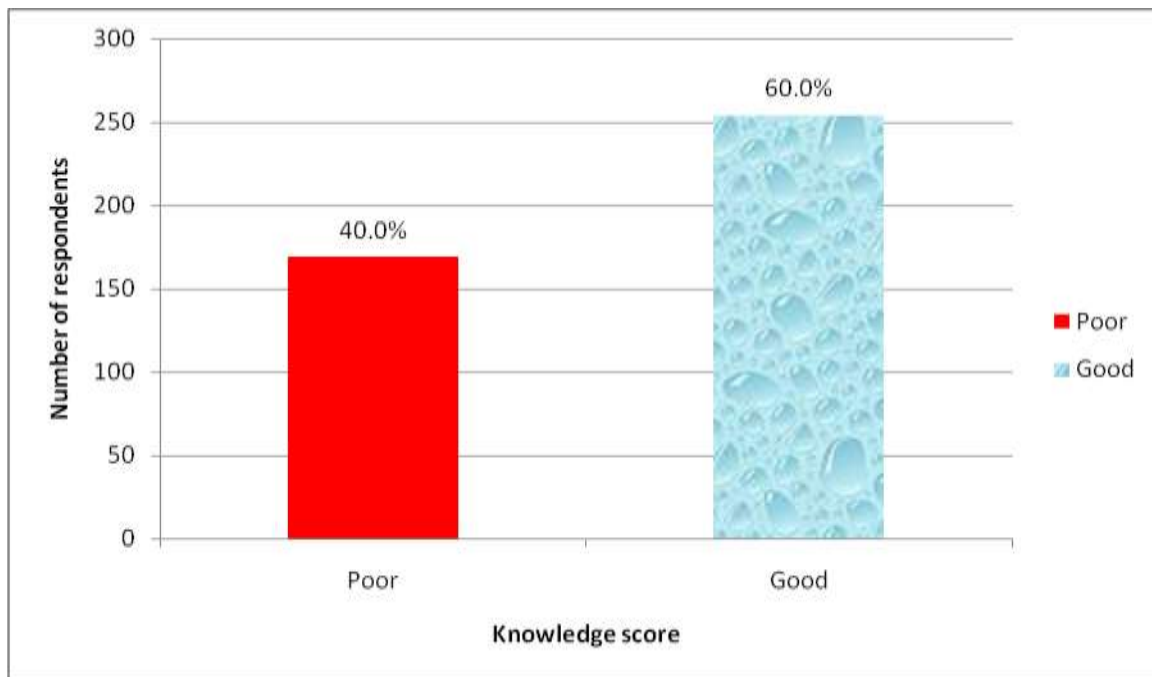


Fig 4.2: Knowledge of health implication of soft drinks (SDs)

4.5 Perception of health implication of soft drinks consumption

This section provides results on questions relating to perception on soft drinks (SDs) consumption. A few percentages (37.6%) of the respondents agreed that a bottle of SD is always good to complement breakfast, lunch, or dinner. Majority of the respondents (90.1%) agreed that SDs should be taken on daily basis. Majority (69.7%) of respondents agreed with the view that SDs reduced quality of life. Majority (71.4%) agreed that frequency of SDs consumption has no effect on the body. Many of respondents (51.1%) of respondent agreed that SDs consumption cannot on its own lead to non-communicable diseases. Majority (66.9%) agreed that SD is associated with weight gain that leads to other diseases. Some of respondents (48.0%) agreed with the view that SD is a measure of one's socioeconomic status. A large percentage of respondents (72.8%) were of the view that frequency of SDs consumption should be reduced to avoid effect on health. Majority of the respondents (85.8%) agreed that SDs predisposed one to developing diabetes. (See details in table 4.5)

Perception score of SDs was calculated for each respondent using a 9-point perception scale. Each correct answer had a point score of 1 and wrong answer or no response had a point score of 0. The scores were summed up to give a composite point score for each respondent. Perception score were also allotted to each respondent in order to know if they have poor (0-5) and good (>5) knowledge. Majority of the respondents (69.3%) had poor perception and few of respondents (30.7%) had good perception (see fig 4.3).

Table 4.5.1: Perception of soft drinks (SDs) consumption

S/No	Statement	Agree	Disagree	Total
	A bottle of SD is always good to complement breakfast, lunch or dinner	159 (37.6%)	264 (62.4%)	423 (100.0%)
	SDs should be taken on daily basis	381 (90.1%)	42 (9.9%)	423 (100.0%)
	SDs reduce quality of life	128 (30.3%)	295 (69.7%)	423 (100.0%)
	Frequency of SDs consumption has no effect on the body	302 (71.4%)	121 (28.6%)	423 (100.0%)
	SDs consumption cannot on its own lead to non-communicable diseases	216 (51.1%)	207 (48.9%)	423 (100.0%)
	SD is associated with weight gain that leads to their diseases	283 (66.9%)	140 (33.1%)	423 (100.0%)
	SD is a measure of one's socioeconomic status	203 (48.0%)	220 (52.0%)	423 (100.0%)
	Frequency of SDs consumption should be reduced to avoid effect on health	308 (72.8%)	115 (27.2%)	423 (100.0%)
	SDs predisposes one to developing diabetes	363 (85.8%)	60 (14.2%)	423 (100.0%)

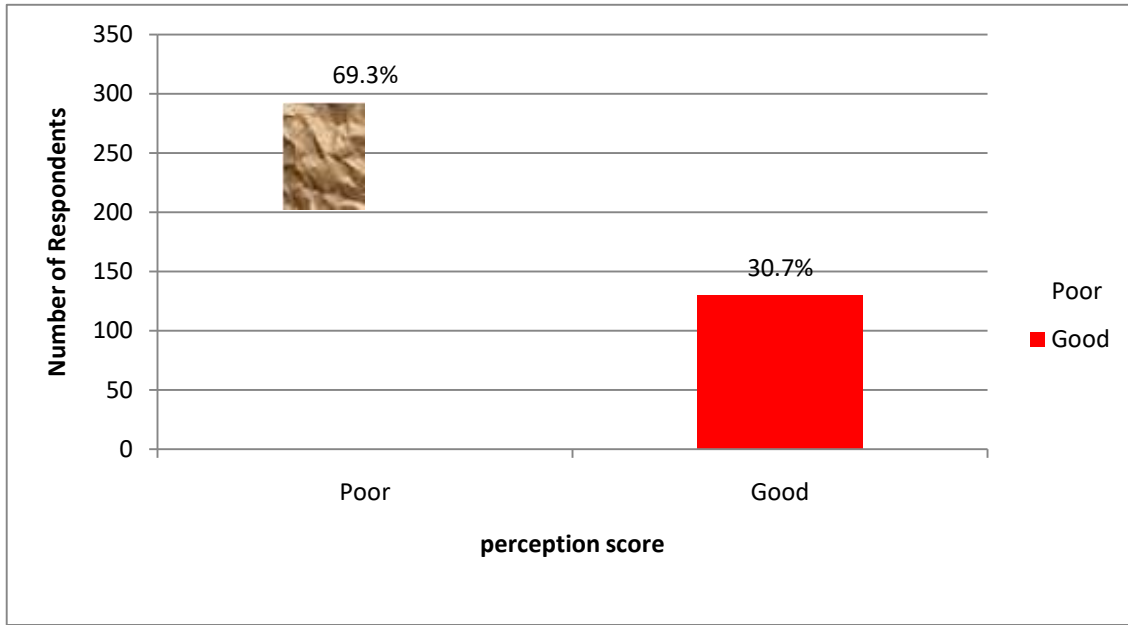


Fig 4.3 Perception of health implication of soft drinks consumption

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4.6 Factors that influence high calorie soft drinks (SDs) consumption

Factors that influence SDs consumption are shown in table 4.6 below. Many (59.3%) of respondents believed that sweetness of SDs make them to take it. Many of the respondents (57.7%) respond that SDs are nearest available when hungry. A small percentage (22.2%) of respondents said their friends take SDs so, they can also take it. Majority of respondents (68.1%) said advert of SDs is not captivating for drinking it. Many (54.8%) of the respondents said SDs are cheap way of filling them up when hungry. Some (49.4%) of respondent said when they buy fast food, they should also get a bottle of SD. A large percentage of respondents (77.1%) said SDs are available in many retail shops in the school. Majority of respondents (63.4%) said the cost of SD does not encourage one to take more. Majority (77.1%) of the respondents were of the view that different promo on SDs like airtime on bottle cover encourages them to take more.

Table 4.6a: Factors that influence soft drinks (SDs) consumption

S/No	Statement	Frequency (N)	Percentage (%)
	The sweetness of SDs makes me to take it		
	Yes	251	59.3
	No	172	40.7
	Total	423	100.0
	SDs are the nearest available drink when I am hungry		
	Yes	244	57.7
	No	179	42.3
	Total	423	100.0
	My friends take SDs so, I can take it as well		
	Yes	94	22.2
	No	329	77.8
	Total	423	100.0
	The adverts of SDs is very captivating so, I want to take the drink		
	Yes	135	31.9
	No	288	68.1
	Total	423	100.0
	SDs are cheap way of filling me up when I am hungry		
	Yes	232	54.8
	No	191	45.2
	Total	423	100.0

Table 4.6b: Factors that influence soft drinks (SDs) consumption

S/No	Statement	Frequency (N)	Percentage (%)
	When I buy fast food, I should also get a bottle of SD		
	Yes	209	49.4
	No	214	50.6
	Total	423	100.0
	SDs are easily available in many retail shops in the school		
	Yes	326	77.1
	No	97	22.9
	Total	423	100.0
	The cost of SD encourages one to take more		
	Yes	155	36.6
	No	268	63.4
	Total	423	100.0
	Different sales promotion on SDs like free airtime on bottle cover encourages me to take more		
	Yes	326	77.1
	No	97	22.9
	Total	423	100.0

4.7 Test of Hypothesis

Hypothesis 1: Null hypothesis stated that there is no significant relationship between frequency of collecting pocket money and pattern of consumption of SDs.

Table 4.7 shows the association between frequency of collecting pocket money and pattern of consumption of SDs. Significant association was found between frequency of collecting pocket money and pattern of consumption of SDs. ($p=0.000$). The data revealed frequency of collecting pocket money influence the pattern of consumption of SDs, therefore the null hypothesis was rejected.

Table 4.7 : Association between frequency of collecting pocket money and pattern of consumption of SDs.

Variables	Frequency of collection of pocket money			Total	Chi square	
	Daily(%)	Weekly(%)	Monthly(%)		X ²	p-value
Bottles of soft drinks (50cl) taken on daily basis						
One bottle	48(21.4)	115(51.3)	61(27.3)	224(100.0)	61.880	0.000
Two bottles	44(35.8)	20(16.3)	59(48.0)	123(100.0)		
Three bottles	3(8.8)	11(32.4)	20(58.8)	34(100.0)		
No, I don't take	1(2.4)	19(45.2)	22(52.4)	42(100.0)		
Total	96(22.7)	165(39.0)	162(38.3)	423(100.0)		

Hypothesis 2: Null hypothesis stated that there is no significant relationship between accessibility and pattern of consumption of SDs.

Table 4.8 shows the association between accessibility and pattern of consumption of SDs. Significant association was found between accessibility and pattern of consumption of SDs. ($p=0.000$). The data revealed frequency of accessibility influence the pattern of consumption of SDs, therefore the null hypothesis was rejected.

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Table 4.8: Association between accessibility and pattern of consumption of SDs.

Variables	Accessibility of SDs		Total	Chi square	
	Easily access (%)	Not easily access (%)		X ²	p-value
Bottles of soft drinks (50cl) taken on daily basis					
One bottle	154(68.8)	70(31.2)	224(100.0)	22.645	0.000
Two bottles	112(91.1)	11(8.9)	123(100.0)		
Three bottles	24(70.6)	10(29.4)	34(100.0)		
No, I don't take	33(78.6)	9(21.4)	42(100.0)		
Total	323(76.4)	100(48.9)	423(100.0)		

Hypothesis 3: Null hypothesis stated that there is no significant relationship between perception of SDs and pattern of consumption of SDs.

Table 4.9 shows the association between perception of SDs and pattern of consumption of SDs. Significant association was found between perception of SDs and pattern of consumption of SDs. ($p=0.000$). The data revealed frequency of perception of SDs influence the pattern of consumption of SDs, therefore the null hypothesis was rejected.

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Table 4.9: Association between perception of SDs and pattern of consumption of SDs.

Variables	Soft drinks consumption cannot on its own lead to NCDs			Chi square	
	Agreed(%)	Disagreed(%)	Total	X ²	p-value
Bottles of soft drinks (50cl) taken on daily basis					
One bottle	98(43.8)	126(56.2)	224(100.0)	18.132	0.000
Two bottles	67(54.5)	56(45.5)	123(100.0)		
Three bottles	18(52.9)	16(47.1)	34(100.0)		
No, I don't take	33(78.6)	9(21.4)	42(100.0)		
Total	216(51.1)	207(38.3)	423(100.0)		

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATION.

This study explored the perception and practice of young people regarding soft drink consumption as a risk factor for non-communication diseases (NCDs). In this chapter, explanations are given as regards the results presented in previous chapter. Implication of the findings of this study to health promotion and education was also discussed. Recommendations were made at the end of this report.

5.1 Social-demographic characteristics and related information.

Four hundred and twenty three students of The Polytechnic participated in this study. The age of respondents ranged from 17-30 years with a mean age of 23.1 ± 3.3 years. This implies that target population consists of young persons. The age range of respondents in the current study suggests that some of the respondents may have completed their secondary school education before the statutory or official age of 18 years as contained in National Policy of Education (Federal Ministry of Education, 1983). Majority of the respondents were single. This is not strange considering the fact that they are still polytechnic undergraduate with no definite source of livelihood and all of them do collect pocket money. The study group was predominantly made up Christians a finding supported by Kupari (2005), who wrote that Christianity is the predominant religion of the southern parts of Nigeria. Few of respondents do collect pocket money weekly, monthly and a very few collect daily, the frequency of collecting pocket money of respondents was found significantly associated with pattern of consumption of SDs

5.2 Pattern of consumption of Soft Drinks (SDs)

More than half of respondents take one bottle of 50cl daily on average. It is in contrary to Wilde et al (2007) who stated that soft drink should consumed only occasionally or in a small amount and occasionally has been defined as “once in a week or less” by the communication on obesity action for child health (COACH), about (29.8%) of respondents usually take soft drink with meals. It is in contrary with Astrup et al (2008) who stated that regular soft drinks should not form the essential part of the meal and / or can be completely avoided during meals. Majority

have easy access to soft drinks which is in line with Astrup et al (2008) who reported that places like vending machine, are fast food channels for sugar sweetened soft drinks because they are easily accessible.

5.3 knowledge of the causes of non-communicable diseases (NCDs)

Although there is no rigid definition of NCDs, it is expected that respondents in defining NCDs would mention its characteristics. A small percentage of respondents were able to define NCDs as diseases that are not transmissible from one person to another. This is reflected in the word 'non-communicable' as well as the fact that these diseases do not require transmitting agents but that they are impairment of the structure or function within the body of an individual (Park, 2007). A very few of respondents were able to give two example of NCDs and few of respondents gave two examples of NCDs. WHO (2011) wrote that the four major NCDs featuring prominently include cardiovascular diseases, cancers, chronic respiratory diseases and diabetes mellitus and WHO (2011a) typically refers to four major modifiable risk factors which are referred to characteristics that societies or individual can change to improve health outcome as poor diet, physical inactivity, tobacco use and harmful alcohol use.

The study revealed that majority of respondents has no idea that intake of SDs lead to NCDs. Hu & Malik (2010) stated that consumption of energy dense food especially sweetened beverages like fruit drink, carbonated soft drink and energy drinks may lead to type 2 diabetes and cardiovascular risk. Also this is similar to Tokunaga et al (2012) stated that diets that contain high levels of sugar known to pose a greater risk for obesity and NCDs. It is often believed that NCDs are restricted to the rich also only adults. This is attributed to their ageing bodily structured and functions which is not unexpected however, in our contemporary times NCDs are not only to adult but it is now taking root among the younger generation this is due to increased urbanization and lifestyle changes which include westernization of diet (Lugiswa,2007; WHO, 2000).

The study revealed that majority of respondents were not of the view that large proportion of all NCDs deaths are occurring in low and middle income countries e.g Nigeria. Dahiru and Ejembi (2013) stated that large proportion of all NCDs deaths are occurring in low and middle income

countries which are estimated to occur in people under 70 years old. Majority of respondents were not of the view that NCDs are curable. Park (2007) stated that NCDs are not only permanent but also leave residual disability. Majority of respondents did not believe that most NCDs span over a long period of time and can only be managed. This is in contrary with the submission of the commission on chronic illness in the United States (1956) which stated that NCDs are non-reversible pathological alteration which require special training of the patient for rehabilitation and may be expected to require a long period of supervision, observation or care (Park, 2007).

5.4 Knowledge of health implication of soft drinks (SDs)

A very few respondents were able to mention two diseases that result from excessive intake of SDs. Duyff (2006); Mercola (2009) stated that most of common health effects associated with increased soft drink consumption are obesity, diabetes, tooth decay, osteoporosis, heart diseases, addictions, eating disorders, neurotransmitter dysfunction and neurological disorders. A large percentage of respondents named one organ that can be affected negatively from excessive intake of SDs. Ventura et al (2010) stated that due to high fructose intake of sugar sweetened beverages (SSBs) triglyceride deposition in the liver, insulin resistance and kidney stone.

Majority of respondents were able to list the major nutrient from SDs. Grimm et al (2004); Denney-wilson et al (2009); Hattersley et al (2009) stated that despite nutritional information being available on each can of soft drink, both young and old continue to consume many litres of soft drinks, irrespective of the facts that soft drinks have no nutritional value, except for its high calorie content. A large percentage of the respondents knew that SDs add to weight. James and Kar (2006) stated that consumption SSBs is associated with weight changes in all ages. Majority of respondents knew not that excessive sugar from SDs cause the body to retain more water. Mercola (2009) stated that excess sugar from the soft drink causes the body to retain more water which was emphasized from mechanism that have been suggested to explain how soft drinks can cause high blood pressure.

5.5 Perception of health implication of soft drinks (SDs) consumption

There are various misconception which exist among the respondents as regards the relationship between SDs consumption and development of NCDs for example, majority agreed a bottle of soft drink is always good to complement breakfast, lunch, or dinner which is contrary to what Astrup et al (2008) who stated that regular soft drinks should not form essential part of the meal and can be completely avoided during meals. A large percentage of respondents believed that soft drink should be taken on daily basis. It is in contrary to what Wilde et al (2007) who stated that soft drink should be consumed occasionally "once in a week or less" by communication on obesity action for child health. Majority of respondents agreed that frequency of soft drink consumption has no effect on the body. This is contrary to Tucker and Burapin (2001) stated that the movement towards more fats, sugar, salt and refined foods moves beyond the optimal nutrient intake adequacy state to one in which diets contribute to rapidly escalating rate of chronic diseases.

Many of respondents agreed that soft drink consumption cannot on its own lead to non-communicable diseases. It is in contrary to onyemelukwe et al (2006) who stated that effect of fructose, large quantities of simple sugars with high calorie intake in soft drink may lead to and aggravate obesity, a known risk factor for diabetes, hypertension and other NCDs. Majority of respondents agreed that soft drink is associated with weight gain that lead to other diseases. Vartanian Schwartz and Brownell (2007) stated that increased soft drink intake was associated with increased energy intake and body weight. Large percentage of respondents agreed frequency of soft drinks consumption should be reduced to avoid effect on health which is in line with Husoy et al (2008) which stated that there are little effects on weight changes for those who decreased consumption of SSBs. Majority of respondents agreed that soft drink predisposes one to developing diabetes which is in context of Mercola (2009) which stated that the most common health effect associated with increased soft drink consumption are obesity, diabetes, heart diseases, neurotransmitter dysfunctions and neurological disorders. It is also consistent with Hu and Malik (2010) who stated that consumption of energy dense foods especially sweetened beverages like fruit drinks, carbonated soft drinks and energy drinks may lead to type 2 diabetes and cardiovascular risk.

5.6 Factors that influence soft drink (SDs) consumption

Many of respondents believed that sweetness of soft drink make them to take it. This is supported by Grimm et al (2004) who stated that preference for the taste of soft drink is the strongest predictor for soft drink consumption. As preference increases, so does the amount of soft drink consumption. Many of respondents respond that soft drink are nearest available when hungry. Cullen and Zaken (2004) stated that school and home are the easiest sources of soft drinks since they spend substantial amount of time there, unless the school environment is healthier, unhealthy dietary choices like soft drink will be opted for. A small percentage of respondents said they take soft drink because their friends take it as well. Grimm et al (2004) stated that peer influence play a pivotal role in soft drink consumption behaviour. Majority of respondents said advert of soft drinks is not captivating so it doesn't make them to take it. It is in contrary to Patrick et al (2005) that stated greater television viewing means greater viewership of these soft drink advertisements. These ads are often endorsed by celebrities with catchy themes making it very attractive. Many of respondents said soft drinks are cheap way of filling them up when hungry. This is in agreement with Vertzeletti et al (2010) who stated that skipping of meal lead to slower metabolism and a drop in blood sugar. This is often compensated for by overeating later on in the day and greater intake of snacks which may include. Some of respondents said when they buy fast food they should also get a bottle of soft drink. In context with Bruijn et al (2007) who stated that fast food purchase will be almost always accompanied by soft drink purchases and frequent visit to the fast food outlets would lead to greater soft intake. A large percentage of respondents said soft drinks are easily available in many retail shops in school. Fernandes (2008) stated that shops in the near radius of schools and homes are the next easy source of soft drinks. Majority of respondents said the cost of soft drink does not encourage one to take more. It is in contrary to what Grimm et al (2004) stated that soft drinks are often conveniently priced such that it is easily affordable. Majority of respondents said different promotion done on soft drinks like airtime on bottle cover encourage them to take more. Patrick et al (2005) stated that heavy marketing strategies are carried out to promote soft drink.

5.7 Implication for Health Promotion and Education

There are three major components of health promotion as defined in the National Health Promotion and Education Policy and its strategic framework plan. These include Health Education, Service Improvement and Advocacy (FMOH, 2007). By health education component, information is directed to individuals, families and communities to influence their knowledge, attitude and skills; service improvement could be achieved through the improvement in quality and quantity of services availability, outreach and input supplies; and advocacy involves activities directed at policy makers to influence laws and policies concerning the direction of services and enforcement of laws.

The impact of information and communication on behaviour change cannot be over emphasized. Information, Education and Communication (IEC) materials can be designed to address the gaps between knowledge about non-communicable diseases and practice of SDs consumption. Nutrition education should be targeted at all young people generally on the importance of adequate diet and the need for physical exercise. This can be implemented through regular peer review, seminars and workshops including visual reminders through postals.

Legislation should be made against the proliferation of soft drinks companies in the country. There should be regulations in the methods of SDs preparation and its sugar and calorie contents.

5.8 Conclusion

The globalization of soft drinks culture has been linked with chronic diseases (Zimmet, 2007), soft drink should be consumed occasionally 'once in a week or less' (Wilde et al, 2007) moreover, regular soft drink should not form the essential part of the meal and can be completely avoided during meals (Astrup et al, 2008)

This study has shown information about SDs consumption and its association with development of NCDs among The Polytechnic students of Ibadan. Although there was a low perception of self vulnerability to development of non-communicable diseases as a result of SDs consumption, however, there were gaps in knowledge about NCDs of frequent 50cl of SDs consumption which

can be enhanced through health education and public enlightenment for healthy nutrition and lifestyles among young people.

5.9 Recommendations

The following recommendations are made to address the various findings from this research study:

1. Development of public health interventions including use of educational campaigns and behavioural change communication (BCC) materials to address various identified misconceptions that encourage excessive SDs consumption. Such misconceptions include: belief that a bottle of soft drink is always good to complement breakfast, lunch, or dinner, belief that frequency of soft drink has no effect on their body, belief that soft drink is associated with weight gain that leads to other diseases and other negative beliefs.
2. There should be legislation against the proliferation of soft drink companies in the society (as taste is one of the major determinants of SDs consumption). Government should put the health of the populace into consideration regardless of the profits to be gained in the establishment of the companies.
3. Occasional visit to soft drink companies would not pose much problem if what people take is soft drink the foundation for nutritional problem is being laid. Therefore nutrition education programme directed at individual to promote healthy dietary intake is of paramount importance.
4. Emphasis should be placed on the need for health education on soft drink choices; it should be included in education curriculum at all levels across the country. This will ensure students so as not to fall victims of nutritional disorders and diet related diseases.
5. Nutritionist and dieticians should be employed in soft drink companies to control the quality and quantity of sugar and calorie content. This will enhance proper monitoring of sugar and calorie content used in the preparation of SDs.

6. Emphasis should be laid on lifestyle education, including appropriate diet and physical exercise, during formal and informal teaching sessions in schools, so as to ensure a healthy adult population for the country.

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APPENDIX I

OBSERVATIONAL CHECKLIST

Variable	Yes	No
Soft drink outlets (Ramat hall)	√	
Soft drink outlets (Olori hall)	√	
Soft drink outlets (Unity hall)		√
Soft drink outlets (Orisun hall)	√	

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APPENDIX II

QUESTIONNAIRE

CONSUMPTION OF HIGH CALORIE SOFT DRINKS AND PERCEPTION OF VULNERABILITY TO NON-COMMUNICABLE DISEASES AMONG STUDENTS OF POLYTECHNIC IBADAN, OYO STATE NIGERIA

Serial No _____

Dear Respondent,

I am OLAOFE OLARONKE BUSAYO, a postgraduate student of the Department of Health Promotion and Education in the Faculty of Public Health, College of Medicine, University of Ibadan and I am carrying out a study on "Perception of Polytechnic Ibadan Students regarding high calorie soft drinks as a risk factor for Non-Communicable Diseases". This research is part of the award of Masters in Public Health (Health Promotion and Education) and the findings will be of enormous benefit in the area of healthy behavioural change. Please note that you are not required to write your name on the questionnaire. Kindly feel free to express your opinion and be rest assured that your responses will be kept strictly confidential.

Your honest and sincere response to the following questions will be highly appreciated.

Thank you.

INSTRUCTION: Please give appropriate answer to each section.

SECTION A: SOCIO-DEMOGRAPHIC INFORMATION

1. Sex 1. Male () 2. Female ()
2. Age as at last birthday _____(Years)
3. Marital status 1. Single () 2. Married ()
4. Level of study 1. ND 1 () 2. ND 2 () 3. HND 1 () 4. HND 2 ()
5. Religion 1. Christianity () 2. Muslim () 3. Traditional () 4. Others, specify _____
6. Hall of Residence: 1. Ramat () 2. Olori () 3. Unity () 4. Orisun ()
7. How often do you collect Pocket Money? 1. Weekly () 2. Monthly ()
3. Others specify _____

SECTION B: PATTERN OF CONSUMPTION OF SOFT DRINK.

(This section contains a set of statement; please tick (✓) appropriately.)

8. At a single time, how much soft drink can you consume? 1. 35cl bottle () 2. 50cl bottles () 3. 2 bottles of 50cl () 4. 1 litres bottle () 5. Others specify _____
9. Have you taken any soft drink in the last 24? Yes () or No ()
10. How many bottle of soft drink (50cl) do you take daily on average? 1. One bottle () 2. Two bottles () 3. Three bottles () 4. Others specify _____
11. When do you usually take soft drink? 1. Feeling thirsty () 2. Visit to friends () 3. With meals () 4. After meals () 5. With snacks () 6. After lecture () 7. Without any reason () 8. Not Specific ()
12. How accessible is soft drinks to you? 1. Easily access () 2. Not easily access ()

SECTION C: KNOWLEDGE OF THE CAUSES OF NON-COMMUNICABLE DISEASES

The table below contains a set of knowledge question; please fill only the option aspect; there is no wrong answer.

SN	QUESTION	OPTIONS	POINT
13.	What are Non-Communicable Diseases?		
14.	Give two examples of Non-Communicable Diseases.		
15.	Give two causes of Non-Communicable Diseases.		
16.	Can intake of soft drinks lead to Non- Communicable Diseases (indicate Yes or No in option)		
17.	Is Non- Communicable Diseases restricted to the rich (indicate Yes or No in option)		
18.	Is Non- Communicable Diseases restricted to only old adult (indicate Yes or No in option)		
19.	Large proportion of all Non-		

	Communicable Diseases deaths are occurring in low and middle income countries e.g. Nigeria etc. (indicate Yes or No in option)		
20.	Not all non-communicable diseases are curable (indicate Yes or No in option)		
21.	Most non-communicable diseases span over a long period of time and can only be managed		

22. POINT SCORE = _____

23. CATEGORY CODE = _____

SECTION D: KNOWLEDGE OF SIDE EFFECTS SOFT DRINKS (SDs).

The table below contains a set of knowledge question; please fill only the option aspect; there is no wrong answer.

SN	QUESTION	OPTION	POINT
24.	Give two examples of SDs		
25.	Mention at two diseases that can result from excessive intake of SDs		
26.	Name two organs that be affected negatively from excessive intake of SDs		
27.	List the major nutrient you can get from SDs		
28.	Does SDs impact your weight? (indicate Yes or No in option)		
29.	Does excess sugar from SDs causes the body to retain more water? (indicate Yes or No in option)		

30. POINT SCORE = _____

31. CATEGORY CODE = _____

SECTION E: PERCEPTION ABOUT SOFT DRINKS CONSUMPTION

The table below contain a set of perception statement; Please tick (√) the most appropriate answer.

No.	INDICATOR	Agree	Disagree	points
32.	A bottle of soft drink is always good to complement breakfast, lunch or dinner			
33.	Soft drinks should be taken on daily basis			
34.	Soft drinks reduce quality of life			
35.	Frequency of soft drinks consumption has no effect on the body			
36.	Soft drinks consumption on its own cannot lead to non-communicable diseases.			
37.	Soft drinks is associated with weight gain that lead to other diseases			
38.	Soft drinks is a measure of one's socioeconomic status			
39.	Frequency of soft drinks consumption should be reduced to avoid effect on health			
40.	Soft drinks predisposes one to developing diabetes			

41. POINT SCORE = _____

42. CATEGORY CODE = _____

SECTION F: FACTORS THAT INFLUENCE HIGH CALORIE SOFT DRINKS CONSUMPTION.

The table below contain a set of statement on factors that influence regular soft drinks; Please tick (√) the most appropriate answer.

SN	INDICATOR	YES	NO
43.	The taste of soft drinks make me to take it		
44.	Soft drinks are the nearest available when I am hungry.		
45.	My friends take soft drinks so I can take it as well.		

46.	The adverts on soft drinks is very captivating so I want to take the drink		
47.	Soft drinks are a cheap way of filling me up when I am hungry.		
48.	When I buy fast food, I should also get a bottle of soft drink		
49.	Soft drinks are available in many retail shops in the school.		
50.	The cost of soft drink encourages one to take more		
51.	Different sales promotion done on soft drinks like free airtime on bottle cover encourages me to take more.		

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