# AN ANALYSIS OF THE IMPACT OF FAST FOOD CONSUMPTION ON OBESITY IN SECOUNDARY GARDE STUDENTS OF GAAF ALIF ATOLL EDUCATION CENTRE

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# DECLARATION

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I hereby declare that this Project is the result of my own work, expect for quotations and summaries which have been duly acknowledged.

Signature: Date: 02-06-2013

AN ANALYSIS OF THE IMPACT OF FAST FOOD CONSUMPTION WHICH LEADS TO OBESITY IN SECOUNDARY GARDE STUDENTS OF GAAF ALIF ATOLL EDUCATION CENTRE

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## ABSTRACT

**BACKGROUND:** This study was conducted to find out the impact of fast food on obesity in secondary grade students of Gaaf Alif Atoll Education Centre. The purpose of the study are; to determine whether secondary grade students of GA. Atoll Education Centre are getting obese due to fast food conception; to identify the dietary habit of the study group; to identify the level of awareness among study group about fast food consumption; to identify the behavior toward fast food consumption in study group; to rule out the causes of fast food conception in study group. This dissertation has 5 chapters. Chapter 1, Introduction and background of the study; chapter 2, literature review with different previous researches; chapter 4, result and data analysis done through research questioner and finally in chapter 5, discussion and conclusion were done based on the analysis of the findings.

**METHODS:** The data were collected through a questioner which was based on research objectives. Samples of 60 students were selected randomly by gender and grade equally to complete the questioner. To analyze the data Microsoft excel and SPSS were used, moreover SPSS paired sample T test was perform to measure the relationship between fast food consumption and obesity.

**RESULTS:** There is a significant relationship between fast food consumption and obesity in secondary grade students of GAAEC. The alternative hypothesis was accepted and the significant level was 0.015.

**CONCLUSION:** Based on finding it is recommended to conduct mass awareness program to teachers parents and as well as students regarding fast food consumption and obesity.

**Keywords:** Fast food, obesity, secondary grade school students.

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## 1.1 Introduction

In modern technological World stress human factor to in active with latest inventions in many areas. The most rapid changing area is fast-food industry. In the past, recent past and present the revolutionary process of fast-food development and interventions on developing fast-food is very influential in the World food industry. It happens due to the life style and busy work schedule of human factor in past and recent past years. People are more like to have sedentary life style than a health active life style. Because they work hard to earn money and they spend that to solve their hunger forgetting their health and well-being.

World Health Organization (WHO) and nations Health Organizations are even alerted with this life style of the community members but they are unable to control it. Because with limited available resources the growing population of the World do not have enough to get free from their hunger. Even the time factor causes them to have only choice of food as fast food.

This chapter is about the introduction of the research including study background, problem, objectives, questions and hypothesis, study significance, study scope and terminology used.

## 1.2 Back ground of the study

Adolescence is one of the most progressive periods during the life span of human (Burgess-Champoux, 2009). However, adolescents often fail to come across the important energy and nutritional needs for physical growth and development in these

periods (Spear, 2002 & Story et al, 2002 cited in Burgess-Champoux 2009). Many adolescents prefer to have fast food in this period due to easy access and even as a fashion or peers pressure. So they enjoy their teenage period to adolescence with fast food putting themselves to ill health later in their life.

Fast-food consumption may contribute to increase the level of obesity, through energy-dense foods, high fat content and large portion sizes (WHO, 2003 cited in Boutelle et al, 2006). In addition, fast food consumption has increased fivefold from 1977 to 1995 in the age group of 2 – 18 years old. By the latter year, fast food was consumed at 9% of eating occasions and involved 12% of daily caloric intake (Wiecha et al, 2006 cited in Davis & Carpenter 2009).

Obesity is an excess portion of body fat. When a person is having 20 % more weight than the normal weight, than he or she is considered as obese (Obesity, 2013). Obesity is one of the most challenging and most common disorders to treat in clinical practice and also a major public health concern (Al rukban, 2003). In addition 21st century's most prevalent, fatal, chronic disorder is obesity. Obesity causes not less than 112,000 deaths in each year in America (What is obesity, 2013). And it is one of the major factors that lead to non-communicable diseases in globally. It can causes type 2 diabetes, high cholesterol, hypertension, gallstones, fatty liver disease, sleep apnea, , stress incontinence, heart failure, degenerative joint disease, birth defects, miscarriages, asthma, cancers in men and cancers in women (what is obesity, 2013).

Adolescent obesity is a forecast of adult obesity (Brown, 2002 cited in Chakar, & Salameh, 2006). Dehghan et al (2005) stated that obesity is accountable for the

increasing prevalence of serious health problems and is a leading preventable cause of death. In addition, psychological disorders like depression occur with growing number of obese children and adolescents. In more affluent countries, obesity is not only common in the middle-aged, but is also becoming more prevalent among adolescents and children (Davis & Carpenter, 2009). Obesity is common across gender, age and any ethnic groups (Ogden et al, 2002 cited in Boutelle et al, 2006). The prevalence of obesity continues to increase, an estimated 4–5 million children and adolescents between the ages of6 and 17 years in the USA are obese (Troiano et al,1998 cited in Boutelle et al, 2006).

## 1.3 Problem statement

Fast food consumption leads to obesity in secondary grade students of GA. Atoll Education Centre (AEC).

## 1.4 Title of the research

An analysis of the impact of fast food consumption on obesity in secondary grade students of GA. Atoll Education Centre.

## 1.5 Objectives of the study

Objectives are the goals that are to be achieved at the end of any work. Objectives of this study highlight the areas that are to be studied in this research. And questionnaire will be developed based on the research objectives. The following objectives will be used in this study to find out the outcome of the study;

1) To determine whether secondary grade students of GA. Atoll Education Centre are getting obese due to fast food conception.
2) To identify the dietary habit of the study group.
3) To identify the level of awareness among study group about fast food consumption.
4) To identify the behavior toward fast food consumption in study group.
5) To rule out the causes of fast food conception in study group.

## 1.6 Research question and hypothesis

Research questions formulated for this study are as follows:-

1. Do the study population have enough knowledge about fast food vs obesity?
2. Do the study population have enough time to have healthy foods?
3. Is there any relation between fast food vs obesity?
4. Is there any relation between parental educational back ground and students' obesity?
5. Is there any relation between parental marital status and students' obesity?

Hypothesis used to test this study are as follows:-

***Null hypothesis***

Ho - There is no significant relationship between fast food conception and obesity in secondary grade students in GAAEC.

***Alternative hypothesis***

H1- There is a significant relationship between fast food conception and obesity in secondary grade students in GAAEC.

## 1.7 Significance of the study

When going through the literature by many authors it is clearly seen that fast food consumption has a positive impact on obesity. Most of the findings are positive while a single author suggested as a negative.

In the Maldives so far no study done in the field. Therefore this will be great challenge and good experience. But in the developed World many countries have done studies on the same subject and findings are relatively positive. This is the first time in the Maldives a study done to this subject. This study will give a guidance to understand the current situation in Maldives for a limited population, and help to develop mass study to other atolls to find out the situation on the subject area. If we neglect these areas, in the future there will be a threat to the community with ill health. It is always remind that healthy nation need a healthy community for its growth and development in order to serve its population. Therefore this study is expected to find out the relationship between fast food consumption and obesity.

## 1.8 Scope of the study

The study aims to find any relation between obesity and fast food consumption among secondary students. It is hoped that early intervention can be brought in place based on the study results. Practice and beliefs of the students can be analyzed and active interventions can be made. The need for promoting healthy dietary habits in schools and at home can be emphasized looking at the study results. In addition this study may be helpful to understand health awareness state and burden of disease amongst this group.

## 1.9 Definitions of terms

**Boil:** (with reference to a liquid) reach or cause to reach the temperature at which it bubbles and turns to vapour.

**Breakfast:** a meal eaten in the morning, the first of the day.

**Carbohydrate:** any of a large group of organic compounds occurring in foods and living tissues and including sugars, starch, and cellulose.

**Calorie:** a unit for measuring how much energy food will produce.

**Dinner:** the main meal of the day, taken either around midday or in the evening.

**Diet:** the kinds of food that a person, animal, or community habitually eats.

**Drowsy:** sleepy and lethargic; half asleep.

**Extended family:** a family which extends beyond the nuclear family to include grandparents and other relatives.

**Energy:** the strength and vitality required for sustained physical or mental activity.

**Frying:** cook (food) in hot fat or oil, typically in a shallow pan.

**Fats:** a fatty substance made from animal or plant products, used in cooking.

**Fast food:** easily prepared processed food served in snack bars and restaurants as a quick meal or to be taken away.

**Hypertension:** abnormally high blood pressure.

**Hamburger:** finely chopped beef made into a flat round shape that is then fried, often served in a bread roll.

**Lunch:** a meal eaten in the middle of the day, typically one that is lighter or less formal than an evening meal

**Mayonnaise:** a thick cold white sauce made from eggs, oil and vinegar, used to add flavours to sandwiches, salads, etc.

**Minerals:** a solid, naturally occurring inorganic substance

**Nutrient:** a substance that provides nourishment essential for the maintenance of life and for growth

**Nuclear family:** a couple and their dependent children, regarded as a basic social unit

**Obesity:** the state of being grossly fat or overweight

**Steam:** the vapour into which water is converted when heated, forming a white mist of minute water droplets in the air

**Snacks:** a small amount of food eaten between meals

**Vitamins:** any of a group of organic compounds which are essential for normal growth and nutrition and are required in small quantities in the diet because they cannot be synthesized by the body

**Weekends:** Saturday and Sunday, especially regarded as a time for leisure

## 1.10 Abbreviation

BMI: Body Mass Index

GA.AEC: Gaaf Alif Atoll Education Center

S.S.S: Secondary School Students

USA: United States of America

WHO: World Health Organization

# CHEPTER 2

# LITERATURE REVIEW

2.1 Introduction

2.2 Overweight and Obesity

2.3 Fast food

2.4 Relationship between Fast food and obesity

## 2.1 Introduction

To understand the study, I will forward a review of the literature on the study area "An analysis of the impact of fast food consumption on obesity in secondary grade students of GA. Atoll Education Centre". There is no specific data available on the same study area in Maldives. Minimal findings are there in the WHO country profile and regional statistics.

This chapter provides full of literature on the study area by different researchers on the past and even it is difficult to find out more about fast food consumption. Therefore I have included all the relevant data available through different authentic sources to support this study.

## 2.2 Overweight and Obesity

Obesity is an abnormal or excessive fat accumulation in the body that later leads to ill health. Body mass index (BMI) is a simplest index to measure weight-for-height regularly to classify overweight and obesity in teenagers, adolescents and adults. It is calculated by a person's weight in kilograms (kg) divided by the square of his height in meter squared ($m^2$). According to the World Health Organization (2011) if BMI is greater than or equal to 25 is overweight and BMI is greater than or equal to 30 is obesity.

The Center for Disease Control and Prevention (USA) defined overweight as at or above the $95^{th}$ percentile of BMI for age and "at risk for overweight" as between $85^{th}$ to $95^{th}$ percentile of BMI for age ( Flegal et al, 2002; Himes & Dietz 1994 cited in

Dehghan et al, 2005). Flodmark et al, 2004 cited in Dehghan et al, 2005) similarly defined that overweight as at or above 85th percentile and obesity as at or above 95th percentile of BMI. Moreover Dehghan et al (2005) states that techniques such as Body Mass Index (BMI), waist circumference, and skin fold thickness have been used broadly in clinical environment. Although, the research methods are more accurate than these methods, they are adequate to identify risk. Williams et al (1992) measured skin fold thickness of 3320 children aged 5–18 years and categorized children as fat if their percentage of body fat was at least 25% and 30%, respectively, for males and females (cited in Dehghan et al, 2005).

Dehghan et al, (2005) suggested that obesity occurs when our energy intake exceeds than our energy expenditure. Mahfouz (2008) states that the prevalence of overweight and obesity among children and adolescents is gradually swelling worldwide. However obesity can affect almost all ages and socioeconomic groups and threatens to overcome both developed and developing countries (WHO, 1998 cited in Al-Rukban 2003). Because nations have to think about developing plans, guidelines to save their population in order to have healthy generation to work for the benefit of nation and the communities. These plans are mostly cost effective and finally affect the country's economy in monetary terms. It is believed that both over-consumption of calories and reduced physical activity are mostly involved in childhood obesity (Dehghan et al, 2005).

Most of the obesity adolescents are more prevalence to develop obesity or transit with obesity to adulthood. Popkin (2002) stated in United States of America (USA), the increase in obesity from adolescence to adulthood is terrific. He also suggested that

overweight prevalence has increased in many countries; such as Brazil (from 4.2 to 14.3%), China (from 6.4 to 7.7%), and the United States (from 15.4 to 25.6%). The annual increase rates of overweight prevalence are 0.5% (Brazil), 0.2% (China), and 0.4% (United States) (Popkin, 2002). However a study conducted by ( Nicklas et al 2001 , Parsons et al 1999 and Whitaker et al , 1997 cited in Dehghan et al, 2005) found that 70% of obese adolescents grow up to obese adults.

It is believed that the prevalence of obesity continues to rise, and the remarkable increases in childhood obesity are specific concern over the past several decades in most of the developed countries. In USA Between the age of 6 to 17 years, there are about four to five million obese children and adolescents (Troiano et al, 1998 cited in Boutelle et al, 2006). A mass nutritional study was conducted in the Maldives by WHO in the year 2011. The study revealed that "overweight male are 27.3 percent and female 43.8 percent and total 35.4 percent of the population is overweight" while "obesity male are 5.9 percent and female are 20.2 percent and total 12.99 percent population is obese" in the Maldives.

Some assessments done by the researchers and suggested that "the increasing prevalence of overweight and obesity is responsible for approximately 300,000 deaths every year" (Allison et al. 1999; McGinnis & Foege 1993 cited in Chou, 2008). Flegal et al (2008) did a similar study and he reported that "a smaller but substantial figure of approximately 112,000 excess deaths in the year 2000". In 1998 obesity is accounted for 9.1 percent of the annual medical expenditure as higher as $ 78.5 billion in USA (Finkelstein et al, 2003 cited in Chou, 2008). Furthermore McGinnis etal,

(2006) says more than 9 million USA children and adolescents are obese, and many are at risk of becoming obese.

WHO (2005) stated that the prevalence of obesity and overweight was estimated in 4281 children aged 5-17 years using the International Obesity Task Force criteria. Overall, 21.5% of the school children were overweight and 13.7% were obese. This study proves a high prevalence of overweight in children and urges the need for interventions aimed at reversing the trends of this emerging epidemic.

Chou (2008) stated that in less than thirty years, America has more than doubled the prevalence of overweight children and adolescents. Moreover in the 1963-1970 periods, 5 percent of adolescents aged 12 to 19 were marked as being overweight and also percentage of children who are overweight has more than tripled by 1999, reaching 13 percent (Chou, 2008). For adolescents, the frequency of overweight has increased nearly tripled in the same period, reaching 14 percent (Centers for Disease Control 2001 cited in Chou, 2008).

Most recently Nguyen (2013) suggested that obesity in adolescence significantly increases the risk of ill health and its associated health deficiencies in adulthood. Reilly et al (2003) stated that obesity among adolescents has become a serious public health concern, because it is related to many adverse health circumstances in adolescence and adulthood which are mostly non-communicable diseases such as heart disease, high blood pressure, cancer, diabetes etc. Overweight and obesity in childhood have major impact on both physical and psychological health as well (Dehghan et al, 2005).

Adolescents who are obese are at increased risk for many negative health impacts in adulthood, including immediate physical risks, such as orthopedic and endocrine conditions, to long-term increased cardiovascular disease, cancer and all-cause mortality (Must & Strauss, 1999; Dietz, 1998; Key et al., 2004; Micic, 2001 cited in Boutelle et al., 2006). Addition to the above physical illnesses and increased body fat mass in adolescents is also associated with psychological isolation, low self-esteem, and development of eating disorders (Chakar, 2006). Moreover the consequential health risks include asthma, hypertension, type 2 diabetes, cardiovascular disease, and depression (Cawley J, 2006 cited in Davis & Carpenter 2009). Additionally, obesity in adulthood is a high risk factor for cardiovascular diseases and chronic diseases, such as hyperlipidaemia, hyperinsulinemia, hypertension and early atherosclerosis (Berenson et al, 1998 & Mahoney et al, 1996 cited in Nguyen 2013).

Mostly the health consequences are more to the endocrine system (hyperinsulinism, insulin resistance, impaired glucose tolerance, type II diabetes mellitus, menstrual irregularity), and mental health (depression, low self- esteem) (Krebs & Jacobson 2003 cited in Chou, 2008). The frequency of type II diabetes in children, originally termed adult-onset diabetes, went from four percent in 1982 to 16 percent in 1994 (Squires, 1998 cited in Chou, 2008). The severe health significances of obesity can produce potentially disabling conditions that can reduce education, the ability to work, and the development of social relationships. Indeed, there is a large body of evidence linking obesity to lower wages, lower education, and a lower likelihood of marriage (Averett and Korenman 1999; Baum and Ford2004; Cawley 2004; Crosnoe 2007; Gortmaker et al. 1993; Han, Norton and Stearns 2009; Morris 2006; Pagan and Davilla 1997; Tunceli, Li and Williams 2006)

Researchers have tended to focus on environmental factors such as the availability of highly palatable and calorie-dense fast food to promote high energy intake as well as the appeal of television, video games, and computers to discourage energy expenditure (Chou, 2008).

Therefore obesity puts children and adolescents at risk for a range of health problems and finally can shut down the person active life. Also obesity also kills the future development and progress of a country by deactivating its youth. Meanwhile the nation has to stop its developmental activities to save its youth by spending money allocated for those activities and programmes. It is always safe to take necessary precautions before condition otherwise time and money will be wasted and cannot shoot any star.

## 2.3 Fast food

Fast food is known as ready made easy access food. Most of us goes to it easy access and timeless to spend on it. It usually consists to more energy and fats that later deposited in the body leading ill health. Human being needs a well-balanced diet for their body activities. Prentice and Jebb, 2003, cited in Boutelle et al, 2006) defined fast food is "to be extraordinary in energy density, and fast-food outlets have an average menu of more than twice or more the energy density of recommended healthy diets". In Fast food restaurants, foods and beverages that are usually classified under the "eat least" category in dietary guidelines but they are most heavily marketed products, especially on television (Davis & Carpenter 2009). In school cafeterias the number of branded fast foods like, pizza and hamburgers are being served, has

increased dramatically in recent years (Story, 1999). Furthermore Story (1999) states that in junior and senior high school cafeterias, high fat cookies, potato chips and other snack chips, French fries, malts and nachos are best-selling items.

The major cause of obesity and overweight is an energy imbalance between calories consumed and calories expended. Globally ,there has been an increased intake of low in vitamins, minerals and other micro-nutrients but increased intake higher of energy-dense foods that are high in fat, salt and sugar. Changes in dietary and physical activity patterns are the result of environmental and social changes associated with development and lack of supportive policies in sectors such as health ,agriculture, transport, urban planning, environment, food processing ,distribution, marketing and education (WHO, 2011).

Adolescents make up a large portion of the labor force at fast food restaurants, where they may receive cut-rate or free food as part of their compensation (Chou, 2008). Because of that most of the families choice is meals that are prepared with fast food that gives some flavours for their daily food consumption. Boutelle et al (2006) has the similar thoughts. However the developing problem of childhood obesity, recent research has begun to focus on family and social influences on children's eating patterns. According to the findings of Story (2002 cited in Patrick and Nicklas, 2005) fast food as the adolescents choice due to its access or availability. Bowman et al (2004 cited in Davis and Carpenter, 2009) reported that they found almost one third of all youths now eat at fast-food restaurants once a day.

## 2.4 Relationship between Fast food and obesity

Over the recent past there was a revolution for the feeding habits of the people according to their life style. Some of them live in a busy schedule while the others live away from their families. These reasons brought them to change their feeding habits towards the fast food industry. Mostly easy access and its flavours, they forget their body needs and they demand for their hunger only. As a result of it throughout the World nations are suffering less resources to cater the ill health population due to life style change feeding habits.

Over the last decades, food has become more reasonable to larger numbers of people as the price of food has decreased substantially relative to higher income and the perception of 'food' has changed from a means of nourishment to a marker of lifestyle and a source of pleasure. Clearly, increases in physical activity are not likely to offset an energy rich, poor nutritive diet (Dehghan et al, 2005).

With the emerging problem of childhood obesity, recent research has begun to focus mainly on family and social influences on children's eating patterns (Patrick, 2005). Research has demonstrated physical and social environment strongly influences that children's eating patterns (Patrick, 2005). With regard to the physical environment, children are more likely to have foods that are available and easily accessible, and they tend to eat more quantities when larger portions are provided. Additionally, characteristics of the social environment, including various socioeconomic and sociocultural factors such as parents' education, time constraints, and ethnicity influence the types of foods children eat (Patrick, 2005). If the school have snack food

vending machine, it is more significant that student snack food purchases from vending (Neumark-Sztainer et al, 2005).

One study reports that fast food weekly consumption by young adults is directly associated with a 0.2-unit increase in BMI (Duffey et al, 2007 cited in Davis & Carpenter 2009). Moreover it takes between 1–2 hours of extremely vigorous activity to counteract a single large-sized fast food portion in children's meal at a fast food restaurant. In addition frequent consumption of such a diet can hardly be counteracted by the average child or adult ( Styne, 2005 cited in Dehghan et al, 2005).

Rapid urbanization and socio-economic development combined with changes in eating habits and in physical activities have led to an increase in obesity in adults, adolescents, as well as in children in East Asia and South East Asia (Stunkard, 2000 cited in Monteiro 2004 ). As a result these changes are concern include high intakes of saturated fat, total fat, and soft drinks, and low intakes of fruits, vegetables, fiber, and calcium-rich foods (French et al 2001; Munoz KA et al 1997 & Neumark-Sztainer et al, 2002 cited in Neumark-Sztainer et al 2005).

In general, overweight and obesity are assumed to be the results of an increase in caloric and fat intake when we consume food (Dehghan et al, 2005). On the other hand, there are associate evidence that excessive sugar intake by soft drink, increased portion size, poor physical activity have been playing major roles in the rising rates of obesity all around the world (Dehghan et al, 2005). Fast food is rich in calories and fat, its consumption may additionally affect diet quality such as by reducing daily

servings of fruit and vegetables (Bowman et al. 2004 & French et al. 2000 cited in Chou, 2008).

Patrick (2005) conducted a study and the outcome of the study stated 57% percent children had fast food and snacks once a week while others had 30% have one to two times, and 13% have more than three times a week. Children eating fast food and snacks were significantly more likely to be over- weight and obese (P=0.027). Eating fast food and snacks once or more a week was strongly associated with overweight among boys (P<0.001) but the association was not significant among girls (0.089) (Mushtaq, 2011). According to WHO (2005) 18.0% of students ate at a fast food restaurants such as McDonalds, Burger King, Pizza Hut, Hardees, Subway or KFC three or more times during the past seven days. Male students (19.3%) are significantly more likely than female students (16.5%) to eat in a fast food restaurant on 3 or more times during the past seven days. Parents also play an important role in children's eating patterns through their behaviors, attitudes, and feeding styles (Patrick, 2005).

Skipping breakfast, eating fast food and snacks once or more a week, physical activity more than twice a week and sedentary lifestyle more than one hour a day were independently associated with overweight and higher BMI (Mushtaq, 2011). In addition, Western calorie-dense fast foods are increasingly available and consumed by the young generation. However Al- Hazzaa (2012) stated that there was no significant association between the frequency of fast food intake and obesity.

Gender specific trend in eating fast food and snacks and incidence of overweight revealed that the relation was significant among boys but not girls. Eating fast food and snacks showed a significant independent relationship with higher BMI and risk of being overweight after adjusting for age, gender and all factors (Mushtaq, 2011).

Moreover higher frequency of eating fast food and snacks was associated with overweight and obesity (Mushtaq, 2011). In addition higher consumption of fast food and snacks was observed among boys, urban children, high income neighborhoods, higher parental education; parents working, fewer siblings and less crowded housing (Mushtaq, 2011). A recent report published by the World Health Organization and the Food and Agriculture Organization of the United Nations concluded that marketing of higher energy-dense foods and fast food outlets is a "probable" cause of swelling overweight and obesity among the world's children (WHO 2003 cited in Robinson 2007 ).

WHO (2005) demonstrated that of the 2200 students interviewed, only 10% reported eating 3 or more servings of fruits and vegetables while, 40.4% of the students ate one or more servings of food typically high in fat content during the previous day .Out of the students who ate one or more servings of food typically high in fat content, 46% ate hamburgers or sausages, 57% ate French fries or potato chips and 59% ate cookies, pies or cakes.

In the United States, home prepared food is less used however the higher energy dense foods, total fat, saturated fat, cholesterol and sodium content of foods are more

significantly used. People in the United States higher BMI have noted who tend to eat in restaurants than those who tend to eat at home (Jeffery & French1998 cited in WHO. Recommendations for preventing excess weight gain and obesity, n.d).

Scully et al (2005) conducted a study to provide a current assessment of Australian secondary students' self-reported dietary, physical activity and sedentary behavior. The study also examined the relationship between television viewing and students' dietary behavior. The prevalence of overweight and obesity among Australian children has doubled since 1985, with one in five now classified as overweight or obese (Booth et al., 2003 cited in Scully et al 2005). The study revealed that a significant proportion of Australian secondary students fall short of current, national dietary and physical activity recommendations. Heavier television use was associated with lower fruit consumption and higher consumption of snacks, fast food meals and high-energy drinks. In other hand some studies that have examined possible associations between the density of fast-food outlets and outcomes such as food consumption and weight status among youths have not found a relationship ( Powell et al 2007 ; Sturm & Datar et al 2005 cited in Davis & Carpenter 2009).

Therefore based on the literature most of the researchers found there is a positive or significant relationship between fast food consumptions and overweight and obesity while one researcher suggested there is no significant relationship between these 2 variables. So it can be proved by the literatures fast food consumptions has a significant relationship between overweight and obesity.

# CHEPTER 3

# METHODOLOGY

3.1 Introduction

3.2 Research design

3.3 Population and sample

3.4 Instrumentation

3.5 Data collecting procedures

## 3.1 Introduction

This chapter presents the methodology developed for this study. Subsequently this portion provides the research design, population and survey sample, sources of data, research instruments and statistical methods used for analyzing data and testing the hypothesis.

## 3.2 Research design

This study is mainly quantitative but in some areas qualitative measures are used. In this research the target population is secondary grade students of GA Atoll Education Centre. A random sample of 60 students used respectively in both sex (30 in each). A well-structured questionnaire used to collect data. Analysis will be done by Microsoft excel and SPSS Version 21 will be used to test hypothesis to find out the relationship between both variables used in the study..

## 3.3 Population and sample

The target population of this research study is the secondary school students of Gaaf Alif Atoll Education Centre, who are studying in grade eight, nine and ten. The totals of sixty samples were collected. From each grade 20 samples were obtained, 10 samples of girls and 10 samples of boys. The population of this research only represents the secondary students of Gaaf Alif Atoll Education Centre. All the samples were randomly selected equally in grade eight, grade nine and grade ten. Each grade has given total 20 samples. Among them 10 sample was taken randomly from girls and other ten sample was taken randomly from boys.

### 3.4 Instrumentation

A well-structured questionnaire was used to collect the data in this study. It is knowledge, Attitude and Practice based survey. The questioner was developed based on the research objectives and research questions, which includes personal information, nutritional knowledge, dietary information, social life information, family information and habitual information. It has a total of 54 questions. Questioner is attached in appendix (01). Weight was measured (nearest to 0.1 kg) by using digital scale (uni scale). Height was measured to the nearest 0.5cm in full standing position without shoes by using a height scale. BMI, defined as body weight in kilograms divided by the square of height in meters, was calculated as a measure of weight category. BMI (expressed in $kg/m^2$) was categorized as follows: underweight <18.5; normal weight 18.5–24.9; overweight 25–29.9; and obese >30 (what is obesity 2013).

### 3.5 Data collecting procedures

As mentioned in the population and sample size, the size of study sample was 60 students from 8, 9 and 10 of GA Atoll Education Centre (figure 1). After selecting the study sample a questionnaire (the research instrument) was taken to each student and they were asked to fill it. Once they completed filling the questionnaire, it was collected back. Before filling the questioner, it was approved by the school management and pretested with 10 students in the same population (grade 8,9,10). The pilot study was done to evaluate the validity of the questions and minimized the errors and it has been modified according to the result of pilot study. In addition all the participants were assured about the confidentiality of the data which are collecting from questioner and it will be used only for the academic purpose.

The data collected through questionnaires were entered in to a data sheet developed in the SPSS version 21. After completing the data sheet hypothesis testing was done using the T-test. The results of the statistical test (Chapter 5) and other analysis are displayed under dater analysis and results (Chapter 4) and the analysis are in tables and figures as well.

### 3.6 Framework of data analysis

The data which was collected to this study will be analysis by using Microsoft Excel and Statistical Package for Social Sciences (SPSS) version 21. The descriptive statics will be analyzed by using Microsoft Excel and inferential statistics will be analyzed by using SPSS. Data analyses are in chapter 4.

# CHEPTER 4

# DATA ANALYSIS AND RESULTS

4.1 Introduction

4.2 Results of Generalized Questions

4.3 Results of Data questions

## 4.1 Introduction

This chapter is about analysis of the data collected. The data are presented using figures and tables whenever necessary. This part also includes the presentation of the study related information's as well hypothesis testing. The organization chosen for this study is GA Atoll Education Centre, GA Villingili. Study population was secondary grade students of GA AEC, among them a randomized sample of 60 were taken for this study respectively in both sex.

## 4.2 Results of Generalized Questions

This part is about the general information of the study population. The first 3 questions (Q1-Q3) of the questionnaire were formulated for this purpose. It was mainly about sex, standard (grade) and height and weight of the participants. To do this study 60 students form GA AEC was selected randomly, where 20 students (10 male and 10 female) each grade 8 to 10. The figure below illustrates the details;

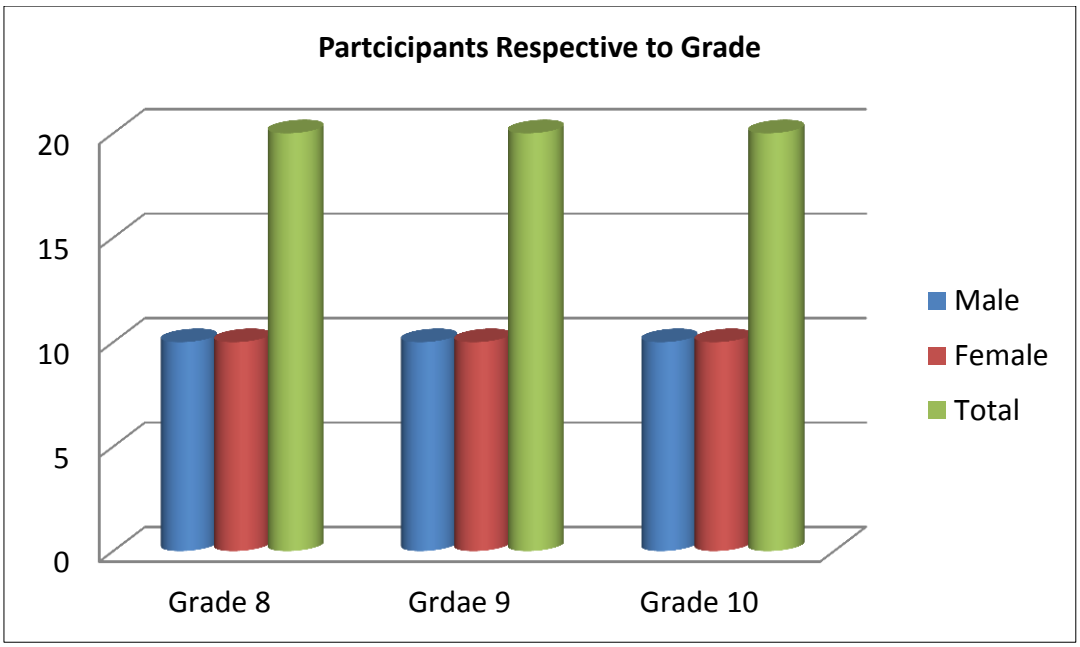


*Figure 4.1: Number of participants respective to grade*

Participants “height and weight” are taken to measure their body mass index (BMI) to categorize whether their weight is according to their height. The figure below shows the details;

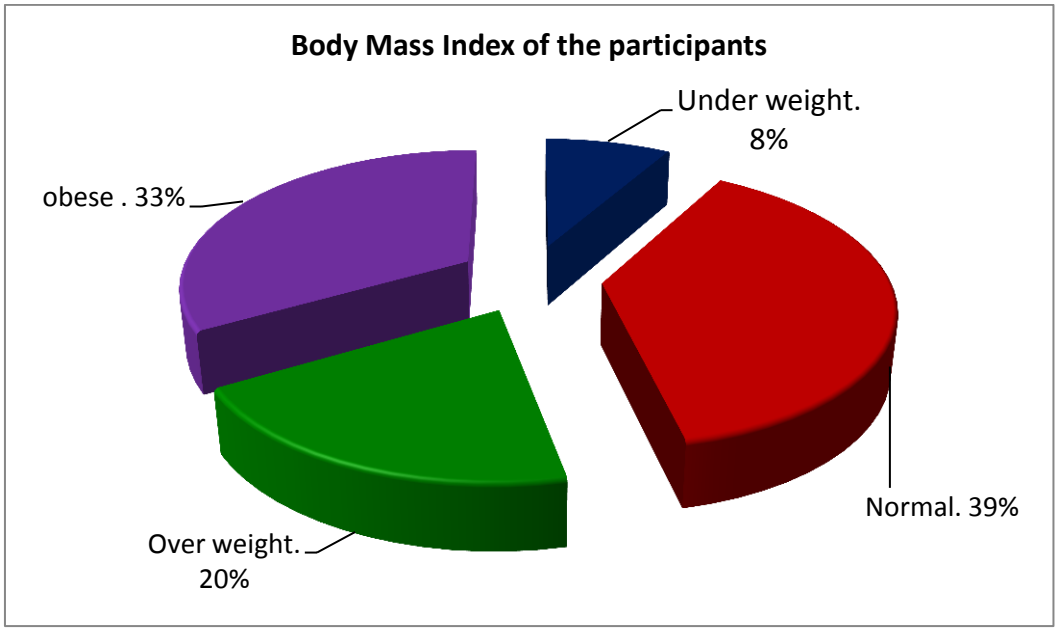


*Figure 4.2: Body mass index of the participants.*

## 4.3 Results of Data questions

This part is about analysis of data questions (Q4-Q49). The participants were asked about whether they had their regular meals. About 35 out of 60 agreed while 25 of them disagreed; where 58.3% and 41.7%.

They were asked separately about the food they normally prefer during their meals. 10 out 60 (16.7%) participants prefer *Roshi / kulhimas / rihaakuru;* 11 out of 60 (18.3%) participants prefer *Bread /fish curry / roshi;* 25 out of 60 (41.7%) participants prefer *Burger/pizza/noodles;* and 8 out of 60 (13.3%) participants prefer *Biscuits /cake /creakers /cereal* while only 6 out of 60 (10%) participants prefer *Sausage / omelet /*

*chips* as their regular meals. Though they justified their type of meal they also explained that sometime they used have combined meals as well. The figure below illustrates the details;

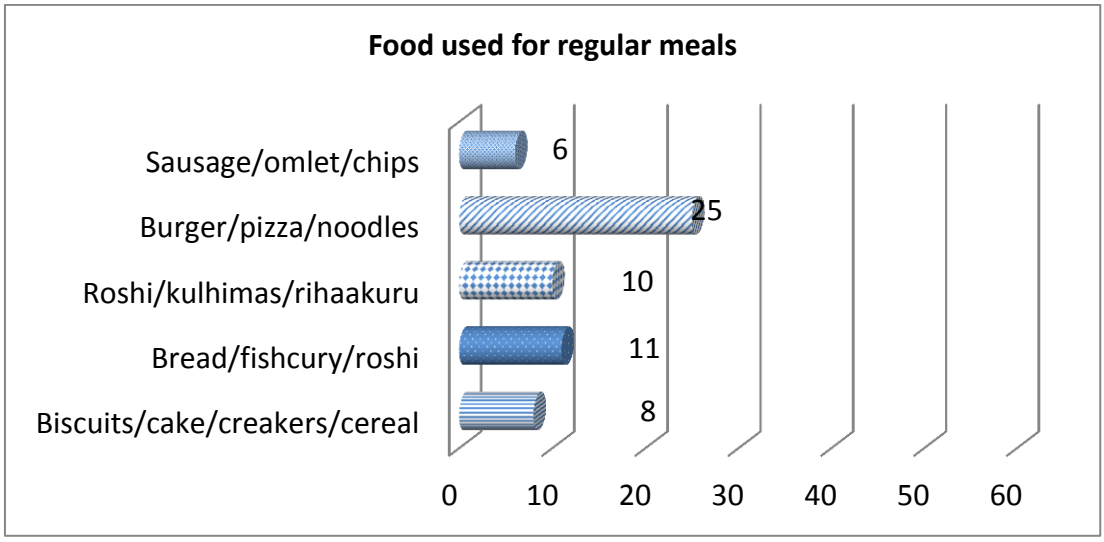


*Figure 4.3: Food used in regular meals.*

When asked about how often they used different diet. Among the survey participants 10 participants said alternative day; 22 participants said once in three days; 20 participants said once in every five days and 8 participants said once a week. The figure below shows the details;

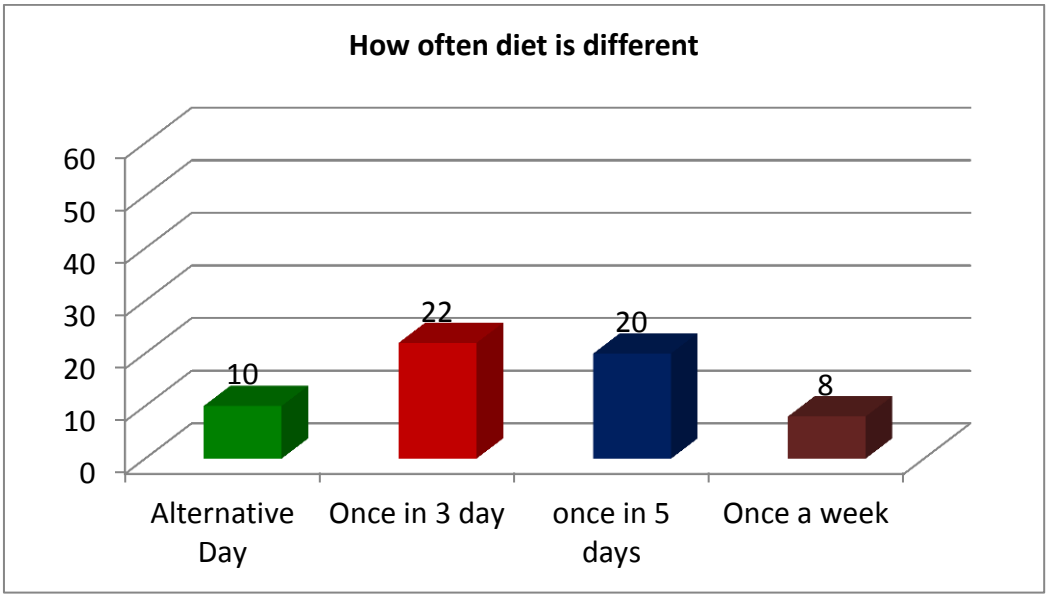


*Figure 4.4: How often diet is different.*

Also they were asked about what was mainly their diet based on. As in the figure (4.5), 11(18%) participants take high protein diet and 29 (49%) participants chose high fat diet and 11(18%) participants chose higher carbohydrate diet and finally there were 99 (15%) participants who take all kind of elements. The table below shows the details;

*Table 4.1: Diet is mostly based on*

| Type of foods | Number | Percentage (%) |
|---|---|---|
| **High Protein** | 11 | 18.3 |
| **High Fat** | 29 | 48.3 |
| **High Carbohydrates** | 11 | 18.3 |
| **All the above** | 9 | 15.1 |
| **Total** | 60 | 100 |

A question separately was asked from them about their snacks. It is to know about their dietary behavior towards snacks or the intermediate meals between 2 meals. Among them 6 participants said *fruits/ fruits juice/ milkshake/ yoghurt;* 10 participants said *biscuits/ crackers/ bread as their snacks;* 4 participants take *potatoes/ popcorn/ soft drinks;* 10 participants said *sweets/ chocolates/ ice cream/ cake* as their snacks and finally a large number of participants (30 – almost 50% of the participants) said *burger/ pizza /noodles* as their snacks. The figure shows the details;

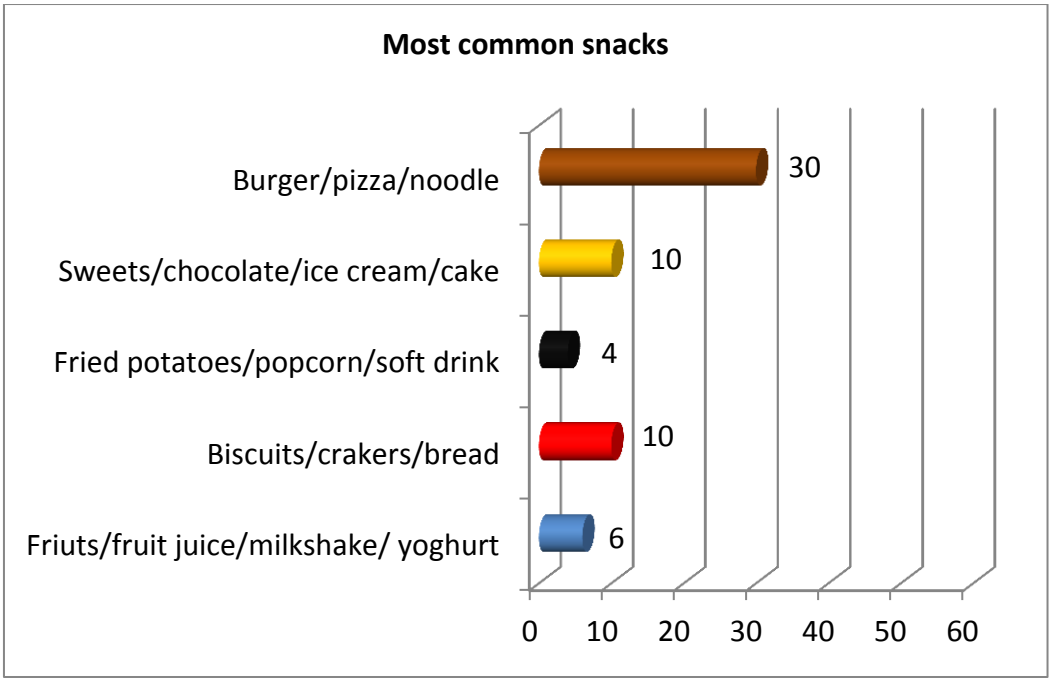


*Figure 4.5: The most common snacks*

Participants were asked about drinks that they used during the meals. 12% of the used fruit juice and milk shake; 20% of them used drinking water; 23% participants used black tea while 45% chose they used to have a soft drinks with meal. The figure below illustrates the details.

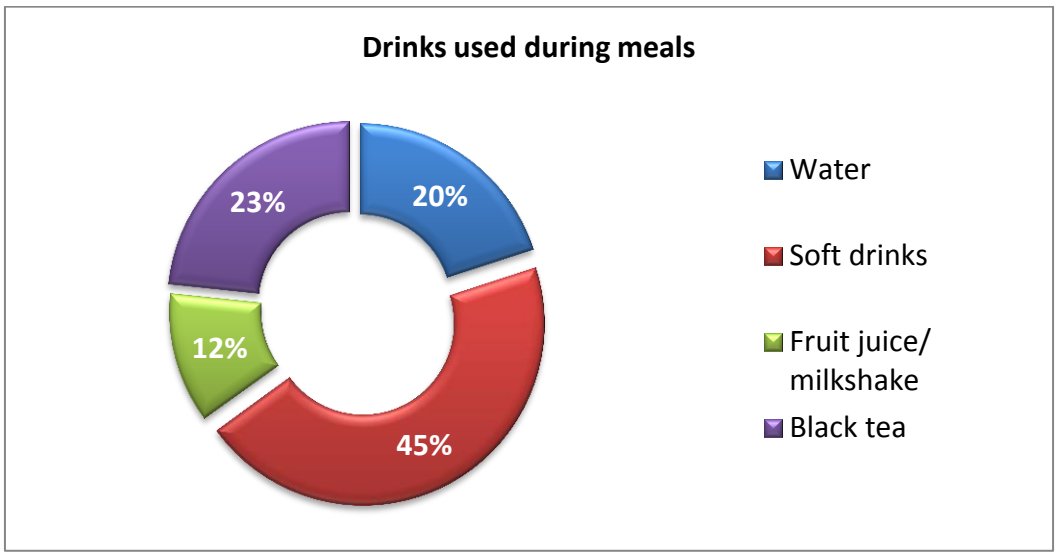


*Figure 4.6: Drinks used during meals.*

They were asked whether they took (ate) 1 cup (250g) of vegetables every day. It was to know their knowledge on vegetables and importance of well balance diet for healthy body and health life style. 4 (7%) participants used to take vegetables always; 38 (63%) participants take vegetables sometimes and finally 18 of them (30%) never take 1 cup of vegetables every day.

As the participants were students, a separate question was formulated to find out the feeding behavior during exam time due to exam stress. 19 out of 60 (31.7%) participants preferred *burger/pizza/noodles;* 12 out of 60 (20%) participants preferred *chocolate;* 11 out of 60 (18.3%) participants preferred *coke* and 9 out of 60 (15%) participants preferred both *chips and coffee* as well. The figure below illustrates it.

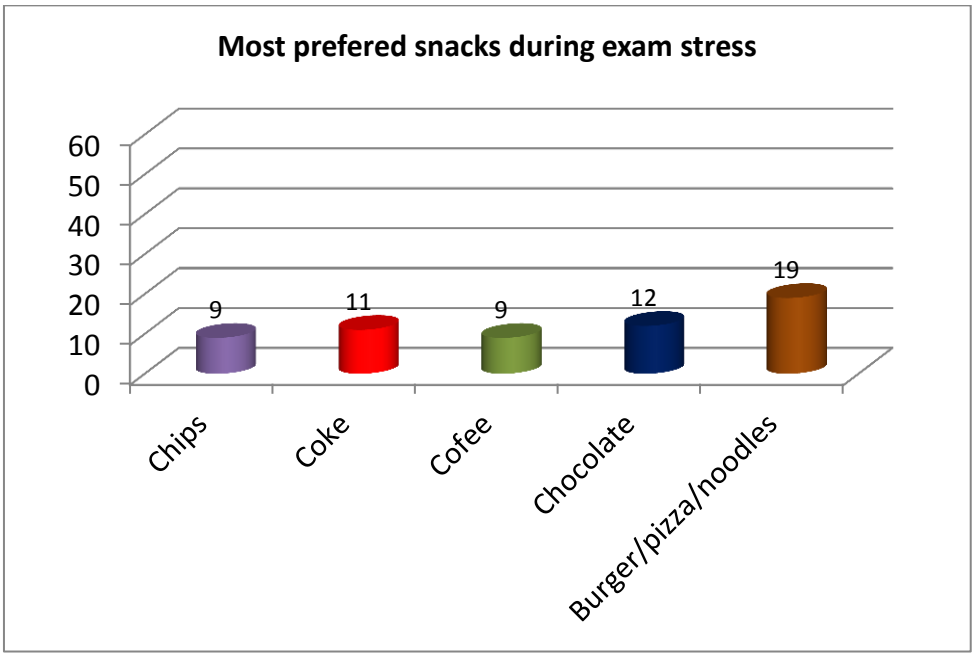


*Figure 4.7: Most preferred snacks during exam stress*

A separate question was asked to know whether the participants used disserts before, during or after meals. 26 of them (44%) said always; 32 of them (53%) said sometimes during and 2 of them (3%) said never.

They were asked whether they were overweight or not. It was to test their knowledge about the BMI. 6 of them said 'Yes' while 54 said 'No'.

A question separately asked from them about how they chose they drinks. 28.3% said peers choice while the least 6% said price. The table below illustrates the details.

*Table 4.2: How do they choose their drink.*

| SN | Types/ choice | No of participants | Percentages |
|---|---|---|---|
| 01 | Peers choice | 17 | 28.3% |
| 02 | Nutritional value | 9 | 15% |
| 03 | Popularity | 15 | 25% |
| 04 | Price | 6 | 10% |
| 05 | Not specific | 13 | 21.7% |
| | **Total** | 60 | 100% |

They were asked about media influence (advertisement) on their home shopping. 53.3% (32 participants) agreed that media influence was there while 46.7% (28 participants) disagreed with suggesting media has no influence on their home shopping.

They were asked about easy access to canteen in the school premises. 55% (33 participants) said 'Yes' while 45% (27participants) said 'No'. Additional question was asked about the type of food available in the school canteen. Most of them (35 participants, 58.3%) said all the type of available in the canteen while 3 of them (5%) said French fries. The table (3) gives the details.

*Table 4.3: Food available in the Canteen*

| SN | Foods available in canteen | No of Participants | Percentages (%) |
|---|---|---|---|
| **01** | *Hedhikaa* ( short eats) | 12 | 20 |
| **02** | Fizzy drinks | 6 | 10 |
| **03** | French fries | 3 | 5 |
| **04** | *Rihaakuru/ Kilhimas/roshi/*rice | 4 | 6.7 |
| **05** | All above | 35 | 58.3 |

They were asked a question whether they get pocket money in any source. 60 out of 60 (100%) said 'Yes'. An additional question was formulated next to the pocket money to find out how they spend it. 41(68.3%) participants used to buy foods; 11(18.3%) participants used buy books and finally 8 (13.3%) participants used to buy cloths. The figure below illustrates it.

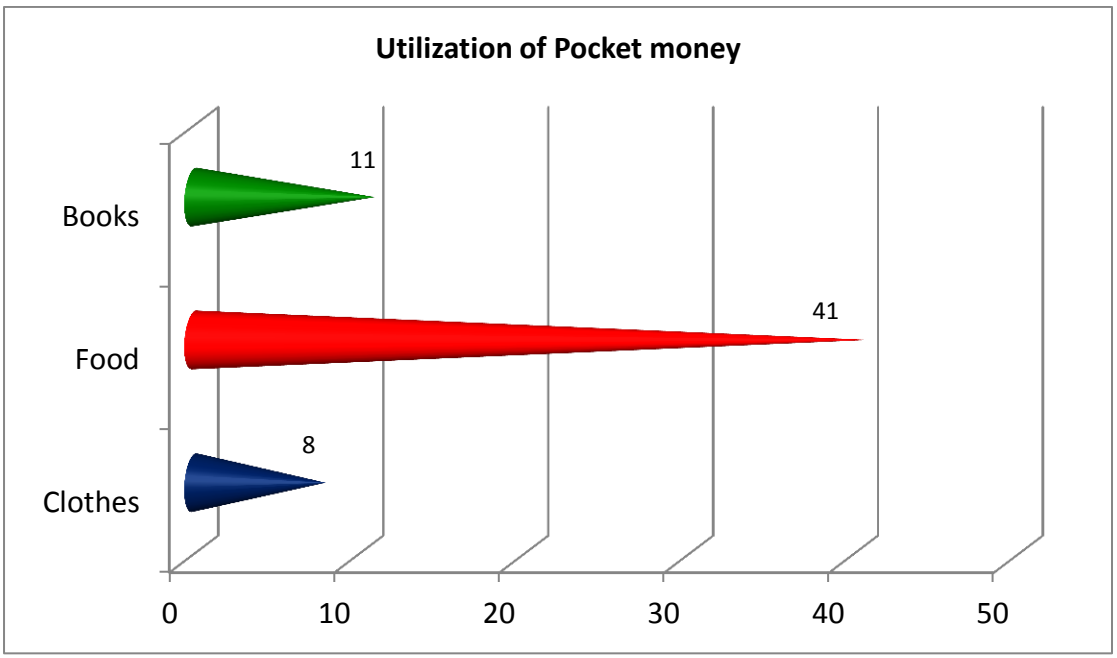


*Figure 4.8: Utilization of pocket money*

A separate question was formulated to know whether family members compensate on them to prefer fast food. So they were asked they were given fast food (Pizza, Burger, submarine etc) as a reward completing tasks at the home. 70% (42 of them) agreed with it while 30% (18 of them) disagreed with it.

Separately they were asked about frequency of restaurants to identify their behavior towards the restaurant. *The figure (4.9) gives the details*. An additional question was asked them about who influence or encourage them to go to restaurant. 40 of them (66.7%) said their family members while 22 of them (33.3%) said friends and peers and none of them said teachers. *The figure (4.10) illustrates it.*

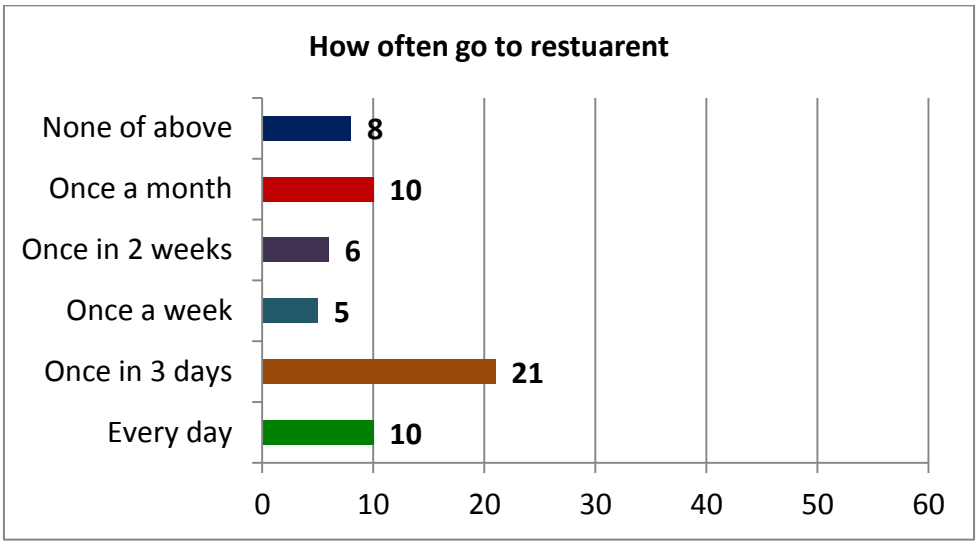


*Figure 4.9: The frequency of going to restaurant*

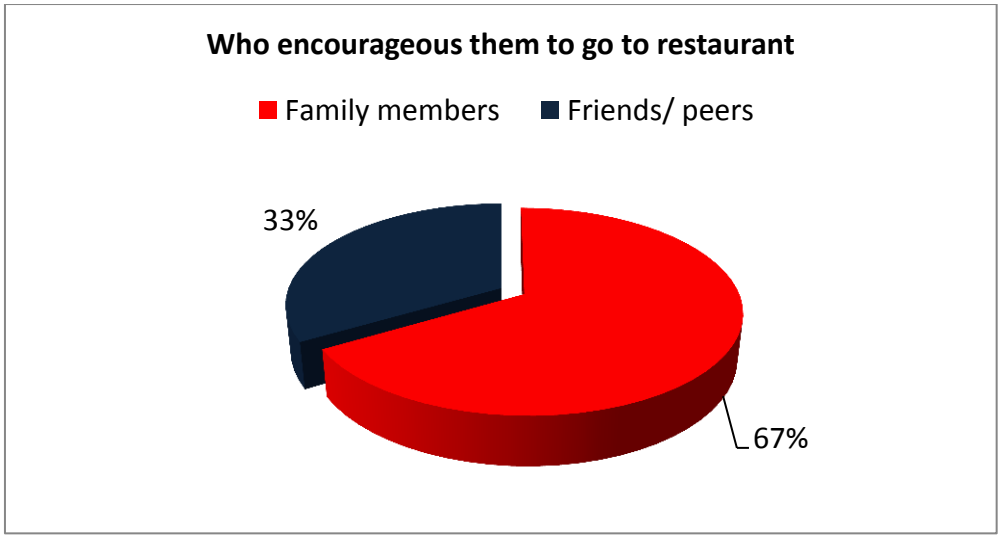


*Figure 4.10: Who encourageous them to go to restaurant*

They were asked how often they had fast food in the restaurant, because as much as they go to the restaurant they might have a cup of coffee, fresh juice etc. instead of fast food. 50% (30 participants) of the study population said always they had fast food in the restaurant. 5% (3 participants) said they never had fast food in the restaurant while 45% (27 participants) said they had fast food sometimes in the restaurant.

Moreover they were asked about the place mainly they get fast food. 38.3% said they used get it in the school canteen while 15% of them said in the home. The figure below illustrates the details;

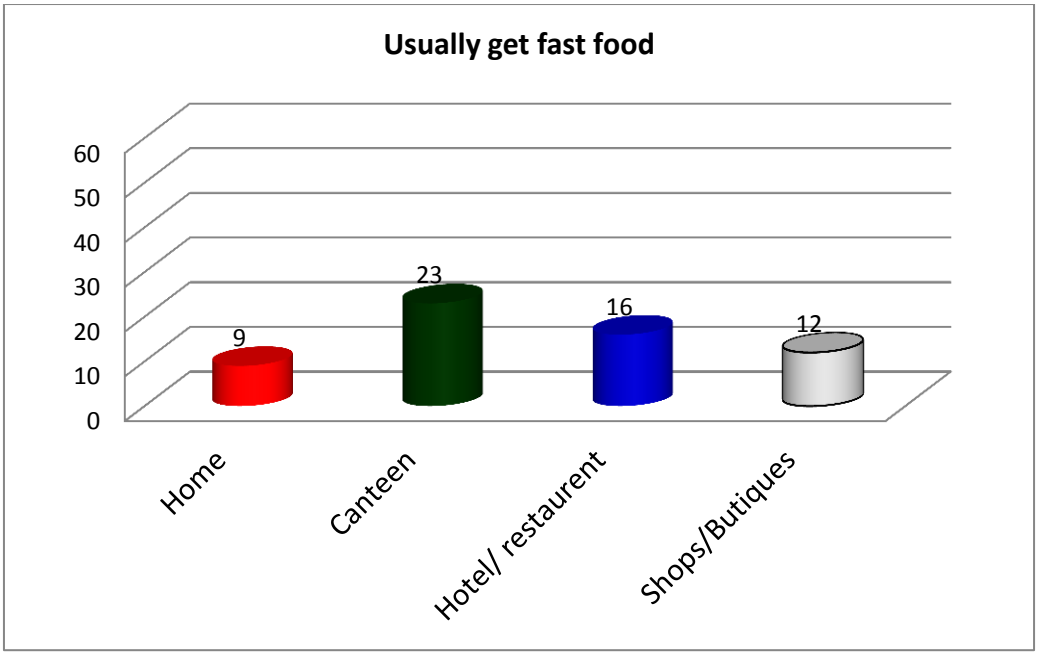


*Figure 4.11: Place where usually get fast food*

A separate question was formulated to know about the reason why they choose fast food instead of health food. They were given 6 choices and out of it participants highlighted only four choices. The table (4) illustrates the details of it.

*Table 4.4: Reasons for fast food*

| Reasons | No of participants | Percentage (%) |
|---|---|---|
| **Easy Access** | 20 | 33.3 |
| **Time Save** | 10 | 16.7 |
| **Cheaper** | 0 | 0 |
| **When Hungry** | 24 | 40 |
| **Just want spend pocket money** | 6 | 10 |
| **Other, specify….** | 0 | 0 |
| **Total** | 60 | 100 |

Separately 3 questions were asked them to test their knowledge on the complications of fast food. Figure (12) shows the results of the question (26). It was about fast food is good for health, 50% of the participants said 'Yes' and 'No' respectively. Figure (13) illustrates the details of the question (27). It was about fast food leads to obesity, 48.3% said 'Yes' while 51.7% said 'No'. Figure (14) presents the details of question (28) 27 of them said 'Yes' while 33 of them said 'No'.

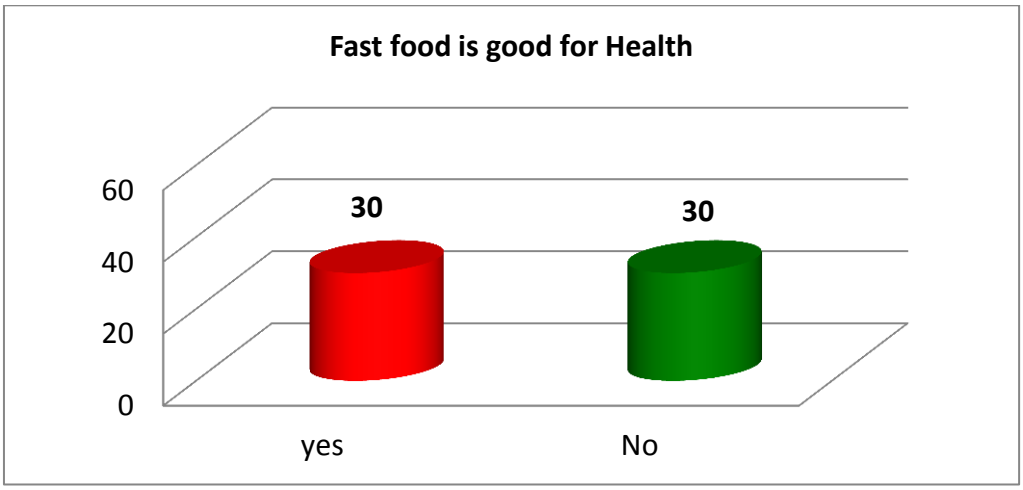


*Figure 4.12: Fast food is good for health*

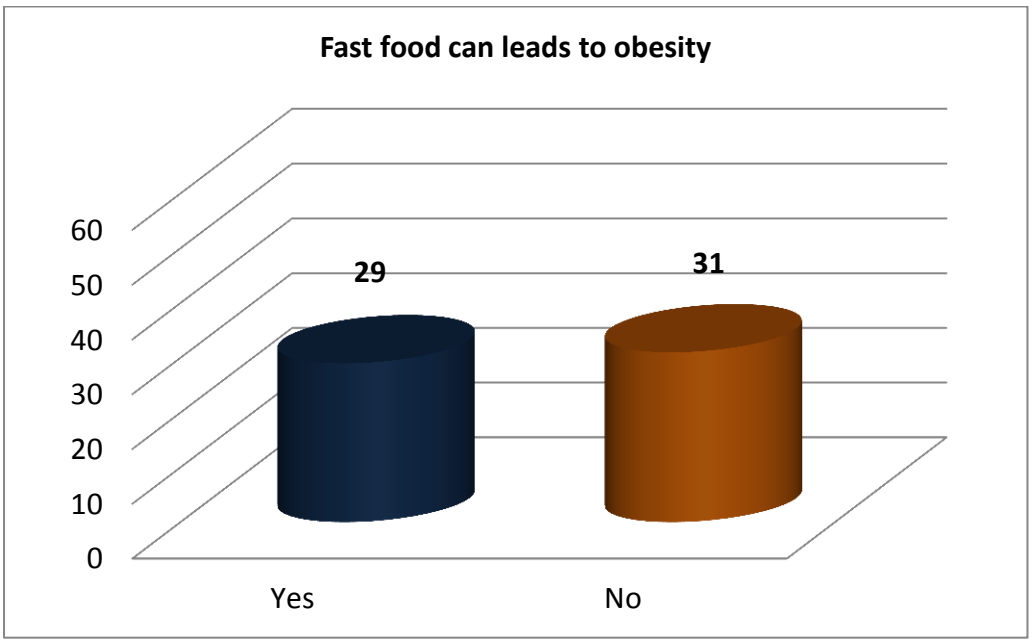


*Figure 4.13: Fast food leads to obesity*

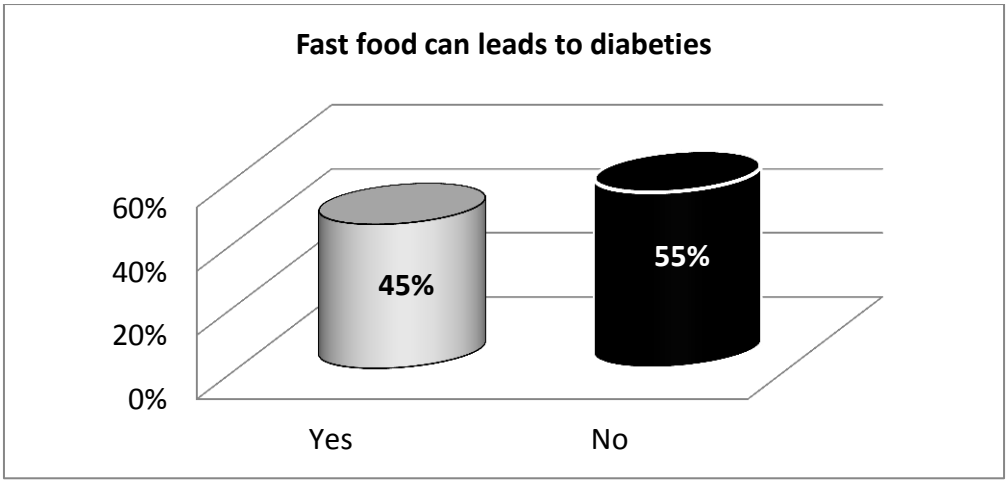


*Figure 4.14: Fast food leads to diabetes*

A question was asked to find out their behaviour towards the fast food. Majority 60% (36 of them) said they used to had fast food watching TV while minority 1.7% (1 of them) said he used had fast food while browsing internet. The figure gives the clear picture of it.

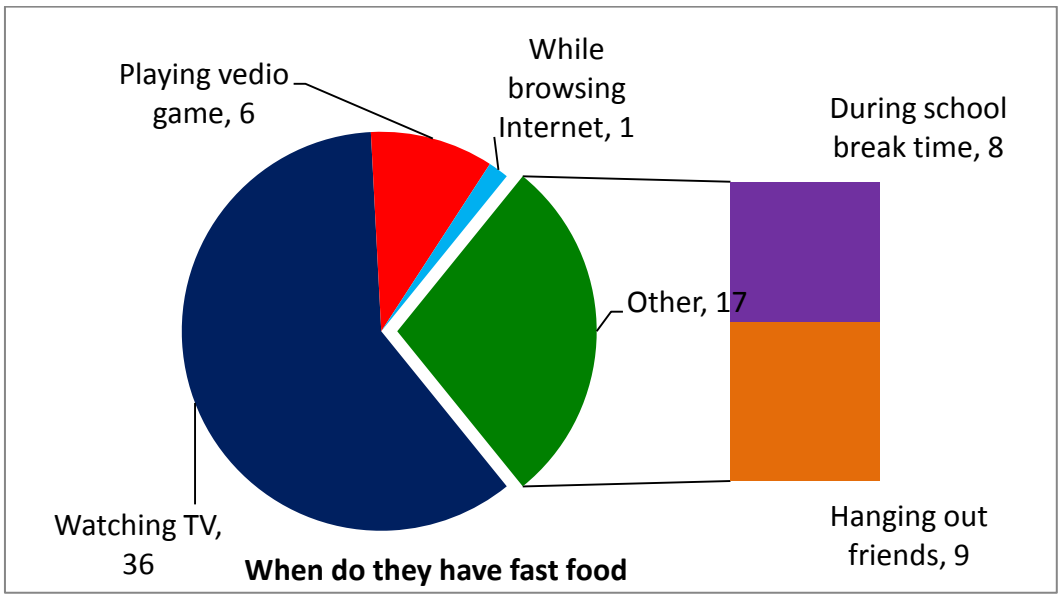


*Figure 4.15: When do they have fast food*

They were asked about the benefits of eating a healthy diet. 55(91.17%) participants told that they knew the benefits of health diet and only 5(8.3%) participants said that they did not know the benefits of a healthy diet.

Also they were asked about the food contains more carbohydrates with limited choices, 34(56.7%) participants said butter; 18(30%) participants said bread and 8(13.3%) participants said meat.

Also they were asked about which food contains more dietary fiber with given list of food, 22(36.7%) participants said beans; 17(28.3%) participants said meat; 11(18.3%) said whole meal bread and 10(16.7%) said white bread. Similarly when they were asked about which food is less rich in fat, among the participants 27(45%) participants said fried meat; 19 (31.7%) participants said grilled sandwich and finally 14 (23.3%) participants said hamburger with mayonnaise.

They were given a list of food and asked which food contains more protein 29(48.3%) said meat; 21(35%) said noodles; 8(13.3%) said nuts and finally 2(3.3%) said apple.
Also when asked about which food contains more calories, 37(61.7%) of them said fruit salad; 10(16.7%) of them said potato and chocolate cake and finally 3(5%) of them said bread.

When the question was asked about the function of vitamins and mineral, 14 participants said vitamins and minerals response to put on muscular tissues; 12 participants said to lose body weight; 23 participants said to catalyze the bio-chemical reaction in the body and finally 11 participants said the function of vitamins and minerals was to provide energy. The figure below illustrates it.

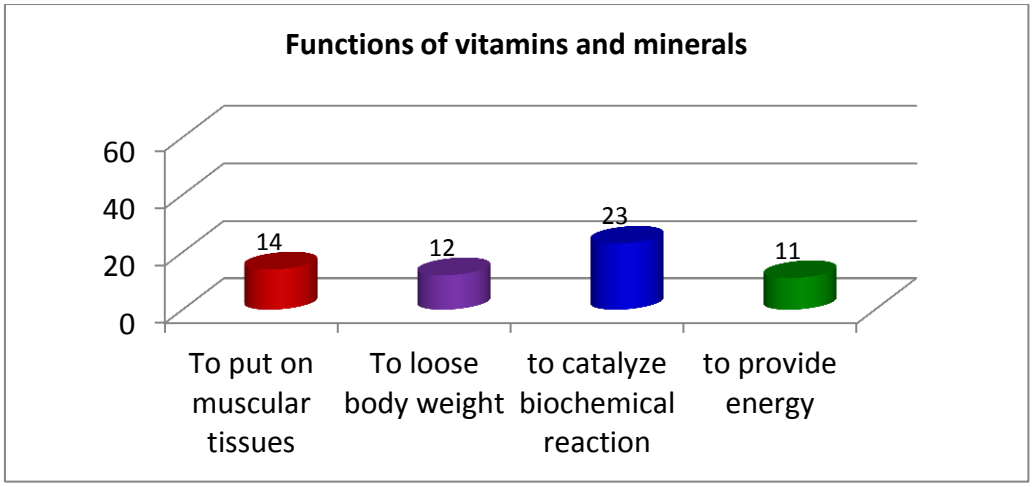


*Figure 4.16: The functions of vitamins and mineral*

They were asked about a balanced diet. 11of them said a balanced diet was 'a diet rich in protein'; 4 of them said that balanced diet was 'a diet rich in fat'; 1 of them said 'a diet which includes fast food' and finally 44 of them said that a balanced was 'a diet containing all the nutrients in proper quantities'. The figure below illustrates it.

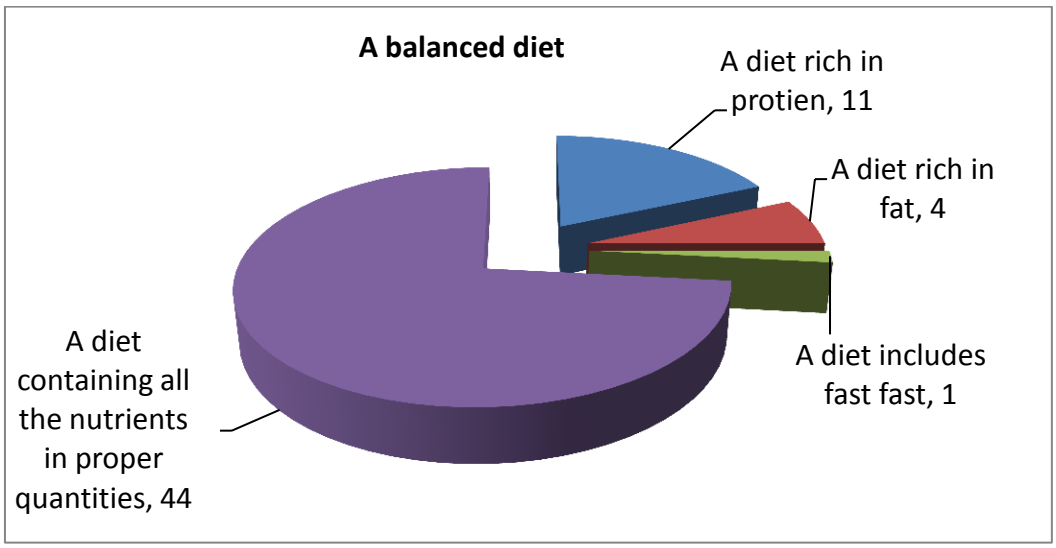


*Figure 4.17: A balanced diet.*

As shown in the figure (4.18) when they were asked about whether fast food can leads to hypertension. 35 out of 60 (58.3%) agreed with it while 25 out of 60 (41.7%) disagreed with it.

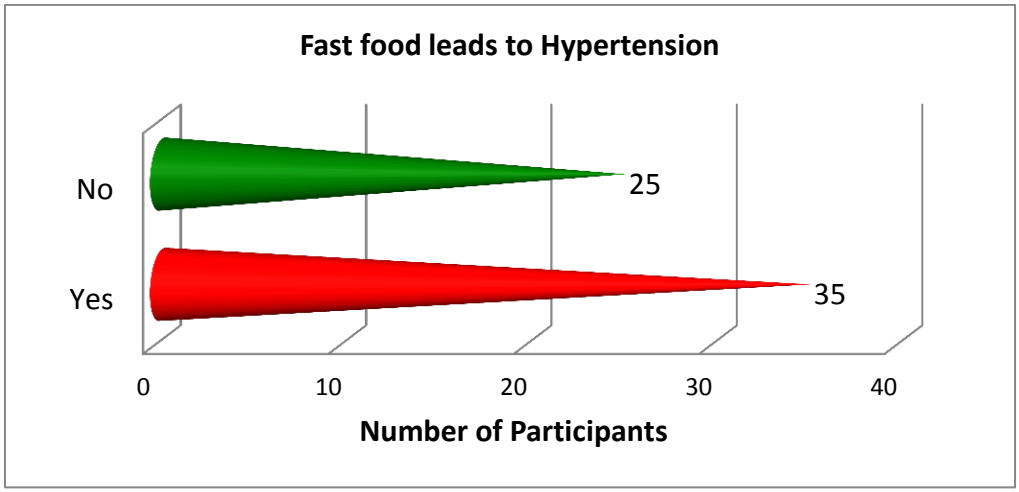


*Figure 4.18: Fast food leads to Hypertension*

When they were asked whether they believed what they ate would affect their health later in their life. 39 (65%) said yes while 21 (35%) refuses, they told it would not affect later in the life.

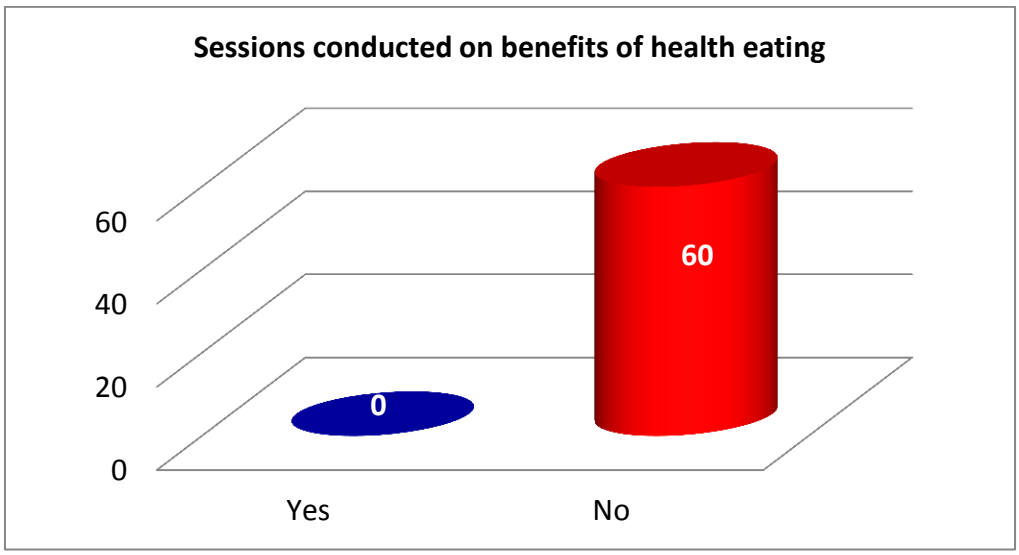


*Figure 4.19: The session taken on benefits of healthy eating*

When they were asked about education session conducted in the classroom regarding healthy ways of to lose weight. 60 of them (100%) said 'No'. Figure below illustrates the findings.

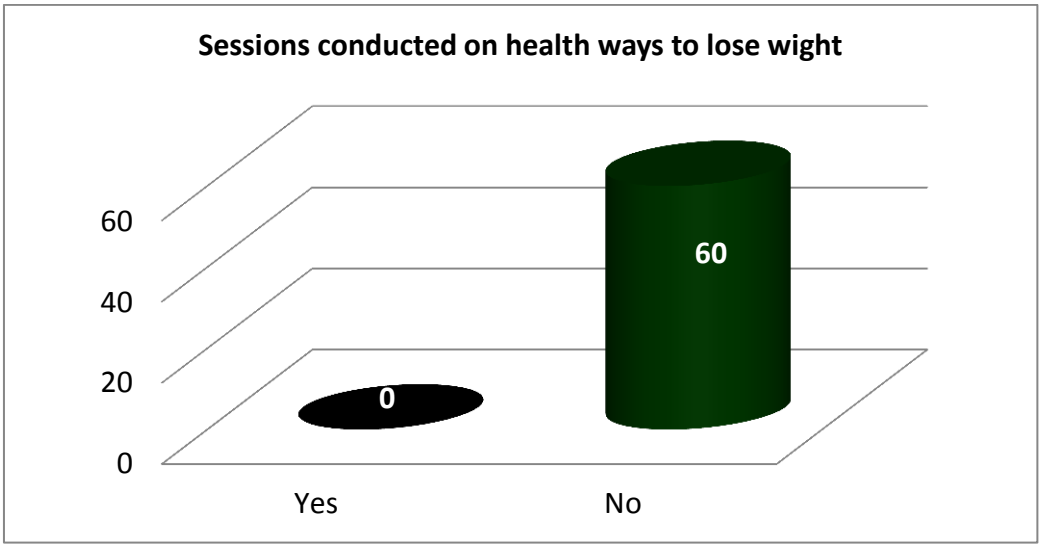


*Figure 4.20: Health ways to lose weight*

They were asked about the healthiest methods of cooking, 21(35%) participants said boiling; 18(30%) participants said steaming and finally 21(35%) said frying.

Moreover when they were asked about the reading ingredients on packaged food, 6 (10%) participants said always; 36(60%) participants said sometimes only and finally 18 (30%) said they never read the ingredients on the packed food.

Also they were asked about the participation in sports, 31 out of 60 participants said yes while 29 out of 60 participants said they did not participate in any sport activity.

A question was formulated to know whether the student belongs to a nuclear family of extended family. In nuclear family if both parents were employed then there would be the risk to the child get into fast foods due unavailability of time for mothers to prepare health food in the house. However extended family in the sense encourageous

health food but they also encourageous out reaches with family members where they too depend on fast food during that time. So the chances are high in nuclear family to go for fast food than extended family. In the surveyed population 23 participants belongs to extended family while 37 participants belongs to nuclear family.

Parental occupational status is an important area to know; where both parents are employed family life balance will be unbalanced. Mostly parents who are working in service sector. 2 questions were separately asked from the participants regarding parental occupational status;

Mothers' occupational status - 55% of the surveyed population said their mother was unemployed while 45% said their mother was full time and part time employed.

Father Occupational status – 60 out of 60 (100%) of the surveyed population was full time employed. The figure below illustrates the findings.

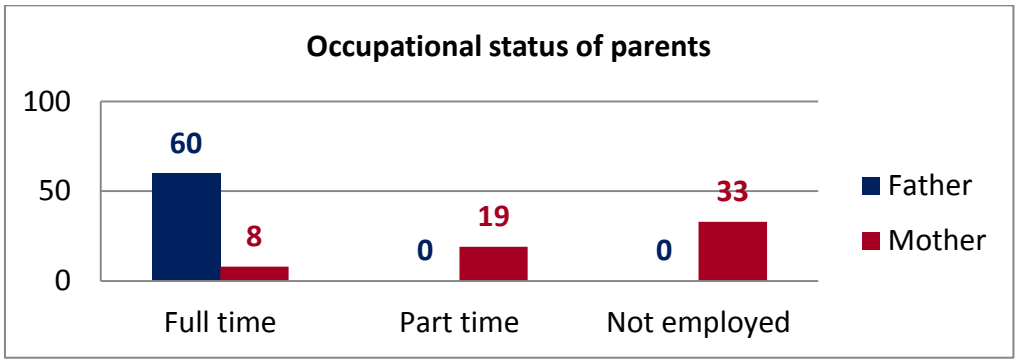


*Figure 21: Occupational status of the parents*

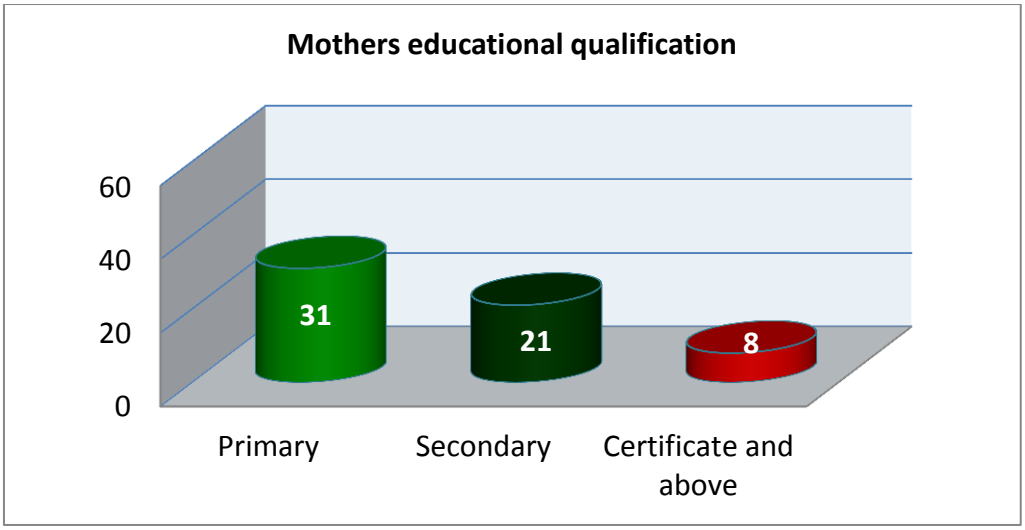


*Figure 4.22: Educational level of the mothers*

As shown in the above figure (4.22) participants were asked about their mothers' educational level. 31 out of 60 (51.7%) participants said their mothers had completed primary education; 21 out of 60 (35.0%) participants said their mothers had completed secondary education and finally 8 out of 60 (13.3%) participants said their mothers had completed certificate and above education.

Finally participants were asked about the marital status of the parents. 96.7% (58) of the participants said their parents were married while 2 of the participants said their parents were divorce.

# CHEPTER 5

# DISCUSSION AND CONCLUSION

5.1 Introduction

5.2 Summary of Main findings

5.3 Discussion

5.4 Implications

5.5 limitation of the study

5.6 Directions for the future references

## 5.1 Introduction

This chapter presents discussion and conclusion of the results of the data analyzed in the chapter (4) of this study. This part also provides a summary of main finding of this study and conclusion is discussed comprehensively. Subsequently implications, limitations of the study are briefly discussed.

## 5.2 Summary of Main findings

This study is about "An analysis of the impact of fast food consumption on obesity in secondary grade students of GA. Atoll Education Centre". The purpose of collecting data and testing the variables the following questions were formulated based on the research objectives.

To collect the data for this study a well-structured questionnaire was formulated based on the study questions. A knowledge, attitude and practice (KAP) survey carried out to gather necessary data through questionnaire. Target population was a random sample of 60 students (30 males and 30 females). The questionnaire was taken to the participants and filled voluntarily. Collected data are filled into the database developed using SPSS version 21 and data analyzed using it and displayed in the form of graph, chart and discussions in the chapter (4).

The main finding of the study is the 53.3% study population is overweight and obese (Q3). The study populations prefer fast food mostly as regular meals more than to 50% of the study population. Their feeding habits of the surveyed population are towards the fast food; because almost 50% of their diet is fat content foods (Q5). The

likely picture has shown in WHO (2005), 40.4% of the students ate one or more servings of food which are typically high in fat content during the last day. Additionally beside their regular meals their snacks are also mainly based on fast foods, because 90% out of 100% of the study population were using fast food during their snack time (Q8). Similarly they used fast food during their exam stress; it covers more than 80% of the survey population (Q11).

## 5.3 Discussion

The main purpose of this study is to find out the relationship between fast food and obesity in students of GA Atoll Education Centre Grade 8, 9 and 10. The biggest challenge was the unavailability of secondary data on the subject area locally. Also the purpose of the research is to answer the study questions (in chapter 3) formulated for this study.

The major components focused in this study are Body mass index (BMI) of the students, their knowledge, attitude and practice towards the fast food. This is aimed to identify students' level of understanding on the subject area and their reaction towards it. Study population was a randomized sample of 60 students respective to both sexes. A well-structured questionnaire used to collect data and a KAP survey was carried out. The participants were explained briefly about the survey and they were assured this information would be used only for the academic purpose and this would be a confidential.

Hypothesis testing was carried out to assess the level of significance of the both variables (Fast food and Obesity).

Dependent Variable (Fast Food) ⟶ Independent Variable (Obesity)

Hypothesis testing was done using SPSS version 21 with T-test (a paired sample T-test) using BMI of the participants and diet is mostly contain. Hypothesis of the study are;-

Hypothesis used to test this study are as follows:-

***Null hypothesis***

H0- There is no significant relationship between fast food conception and obesity in secondary grade students in GAAEC.

***Alternative hypothesis***

H1 - There is a significant relationship between fast food conception and obesity in secondary grade students in GAAEC.

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| Pair 1 | Body Mass Index - Your Diet is mostly contains | .483 | 1.490 | .192 | .098 | .868 | 2.513 | 59 | .015 |

*Table 05: Output file of SPSS run to test hypothesis*

The table shows there is significant relationship between BMI and dietary contents of the students. It justifies if the students having high fat diet instead of a healthy diet, it will lead them to obesity. Therefore it rejects null hypothesis and accepts alternative hypothesis, the significance level has to be less than 0.05, and this study significant level is less than 0.015.

Based on the other findings it can be seen that the students are motivated towards the fast food due to many reasons (Q25). The study population was obese and overweighed (Q3) and very much depend on snacks (Q8) and mostly they used to have fast food while watching TV, hanging out friends (Q29). Moreover they are not much engage in sports (Q44). So these findings are very much similar to Savige,.G et al (2007). They states that increased levels of sedentary behaviour are likely to be associated with this increase in obesity , changes in food consumption patterns are also likely to play an important role. Snacking is likely to play an important role in the development of overweight and obesity. The study revealed that the most common circumstances for snacking among adolescents were after school, while watching TV and while hanging out with friends. In addition they did not have enough knowledge regarding a healthy diet (Q26, Q27, Q28, Q30, Q31, Q32, Q34, Q35, and Q36). These questions justify the knowledge of the participants and why they have chosen fast food as their main components of every day meals.

The study also high lights that the students are with lack of knowledge due to carelessness or insufficient knowledge of the concerned person in the school who is responsible for health and well-being of the students (Q44). The modern education system enhances students to go with physical, mental, psychosocial well-being with their educational improvement. So it is a responsibility of the health officer or the

management to address unhealthy habits and activities and help students to overcome with it in order to have a health community in future progress (Q40, Q41).

Parents also has to play vital role in the well-being of their students, some of the families are nuclear families (Q45) where both the parents go for the job and money cure the hunger of the kid buying a fast food or other food item which might cause ill health for the child in the future (Q46, Q47). ). Research has shown that the family strongly effects childhood eating practices, including children's approaches toward food ( *Nicklas et al, 2005 cited in* Patrick, 2005*).* Parents should give proper food and teach them to follow right and wrong way in seeking and learning healthy related activities inside and outside the house. Chou (2008) said Mother's employment status is not significantly associated obesity, but in this study mothers employment status is very much affected to child's obesity. In this study's result is very much likely to ( Hart, 1997 *cited in* Patrick, 2005) said, today's parents have longer work hours, and many families consist of only one parent or of two parents who are both working outside the home. Thus, parents gradually depend on on convenience foods.

Finally based on the results of the data analysis and hypothesis test result this study concludes that "there is significant relationship between consumption of fast food and obesity of the secondary students of GA Atoll Education centre". Therefore it is important that the management, parent teacher association and concern bodies to find out the solution to save our children. It will be safe if we try to keep them safe now and there.

## 5.4 Implications

Base on study findings, it is advisable to conduct health education for obesity prevention; it should be aimed to encourage adolescents for healthy eating behaviors and regular physical activities. In addition to that conduct health awareness program to parents and teachers about healthy eating life style and the importance of physical exercise. Moreover restriction of intake of higher energy drinks, limiting television view and engaging more family meals can bring down obesity.

## 5.5 limitation of the study

This dissertation research study faced many limitations, among them was a small research population as it is not the representation of the all the secondary school students of the Maldives. Time constraint was one of the main issues, Unforeseen bad weather played a major role in transportation. In addition lack of financial resource was another key factor. In addition, unavailability of secondary data in Maldives also one of the limitation. Moreover, the availability of logistics, height and weight recording methods had its own limitations.

## 5.6 Directions for the future references

It is advisable to do more research on this field to understand the magnitude of the problem and to clear out the main cases as well. The researches can be target to children, adolescent and adult.

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## APPENDICES (01)

**Knowledge and behavior of the secondary students of Gaaf Alif Atoll Education Centre about fast food consumption.**

**(Circle / Fill question)**

| | |
|---|---|
| 1. You are<br>a. Male<br>b. Female | 2. You are in grade<br>a. Eight<br>b. Nine<br>c. Ten |
| 3. Your<br>a. Height is …… inch<br>b. Weight is …… kg | 4. During the past 14 days, did you have regular meals?<br>a. Yes<br>b. No |
| 5. What you normally prefer as regular meal.<br>a. Biscuits / cake / crackers / cereal<br>b. Bread / Fish curry and roshi<br>c. Roshi / *kulhi mas /Rrihhaakuru*<br>d. Burger / Pizza / Noodles<br>e. Sausage /omelet and chips<br>f. If other, specify …… | 6. How often your diet is different<br>a. Alternative day<br>b. Once in 3 days<br>c. Once in five days<br>d. Once a week |
| 7. Your diet is based mainly on<br>a. High protein content food (meat, fish, egg, cheese)<br>b. High fat content food (sausages, fried potatoes, cake with butter and cream)<br>c. High carbohydrate content food (bread, pasta, rice, potatoes, biscuits)<br>d. All above | 8. Your snacks are based mainly on<br>a. Fruit / fruit juice / milk shakes / yoghurt<br>b. Biscuits / crackers / bread<br>c. Fried potatoes/ popcorn/ soft drinks<br>d. Sweets/ chocolate/ ice-cream/ cake<br>e. Burger / Pizza / Noodles |

| | |
|---|---|
| 9. Which drinks do you usually use during meals<br>a. Water<br>b. Soft drinks (cola, iced tea)<br>c. Fruit juice and milk shakes<br>d. Black tea | 10. Do you eat at least 250g (1cup) of vegetables every day?<br>a. Always<br>b. Sometimes<br>c. Never |
| 11. When you are stress during exam, what do you prefer to have<br>a. Chips<br>b. Coke<br>c. Coffee<br>d. Chocolate<br>e. Burger / Pizza / Noodles | 12. Do you eat any sweet item during or after meals?<br>a. Always<br>b. Sometimes<br>c. Never |
| 13. Do you think you are over weight<br>a. Yes<br>b. No | 14. How do you choose your drinks?<br>a. Peers choice<br>b. Nutritional value<br>c. Popularity of drinks<br>d. By price<br>e. Not specific |
| 15. Does the media advertisement influence your home shopping?<br>a- Yes<br>b- No | 16. Do you have easy access to canteen?<br>a. Yes<br>b. No |
| 17. What are the foods available in canteen ( can choose more than one )<br>a. *Hedhikaa(short eats)*<br>b. Fizzy drinks<br>c. French fries<br>d. *Rihaakuru/ kulhimas/Roshi/rise*<br>e. All above | 18. Do you get pocket money?<br>a. Yes<br>b. No<br>If No, go to question NO: 23 |

| | |
|---|---|
| 19. What you do with pocket money?<br>a. Spend on clothes<br>b. Spend on foods<br>c. Spend on books | 20. Are you offered fast food for completing tasks as a reward at home<br>a. Yes<br>b. No |
| 21. How often you go to the restaurant?<br>a. Every day<br>b. Once in three days<br>c. Once a week<br>d. Once in 2 weeks<br>e. Once a month<br>f. Non of above | 22. Who influences your food habits mostly?<br>a. Family members<br>b. Friends<br>c. Teacher |
| 23. How often do you take fast food at restaurant?<br>a. Always<br>b. Sometimes<br>c. Never | 24. From where do you usually get fast food?<br>a. Home<br>b. Canteen<br>c. Hotel/ restaurant<br>d. Shops / Boutiques |
| 25. Why you choose fast food?<br>a. Easily accessible<br>b. Time save<br>c. When hungry<br>d. Just want spent pocket money<br>e, Other, specify …… | 26. Do you think fast food is good for health?<br>a. Yes<br>b. No |
| 27. Do you believe fast food can lead to obesity?<br>a. Yes<br>b. No | 28. Do you believe fast food can lead to diabetes?<br>a. Yes<br>b. No |

| | |
|---|---|
| 29. When do you have fast food the most?<br>a. Watching TV<br>b. Playing video game<br>c. While browsing inter net<br>d. During school break hours<br>e. Hanging out friends | 30. Do you know what benefits you could gain by eating a healthy diet?<br>a. Yes<br>b. No |
| 31. Which food contains more carbohydrates?<br>a. Meat<br>b. Butter<br>Bread | 32. Which food does not contain dietary fiber?<br>a. White Bread<br>b. Whole meal bread<br>c. Beans<br>d. Meat |
| 33. Which food is less rich in fat?<br>a. Hamburger with mayonnaise<br>b. Fried meat<br>c. Grilled Sandwich | 34. Which food is richest in protein?<br>a. Nuts<br>b. Meat<br>c. Noodles<br>d. Apple |
| 35. Which food is less rich in calories?<br>a. Bread<br>b. Potatoes<br>c. Fruit salad<br>d. Chocolates cake | 36. What are the functions of vitamins and minerals?<br>a. To put on muscular tissue<br>b. To lose body fat<br>c. To catalyze biochemical reaction in the body<br>d. To provide energy |
| 37. According to you, what is a "balance diet"<br>a. A diet rich in protein<br>b. A diet rich in fat<br>c. A diet which includes fast food<br>d. A diet containing all nutrients in proper quantities | 38. Do you believe fast food leads to hypertension?<br>a. Yes<br>b. No |

| | |
|---|---|
| 39. Do you believe what you eat will affect your health later in your life?<br>a. Yes<br>b. No | 40. During this school year were you taught in any of your classes the benefits of healthy eating?<br>a. Yes<br>b. No |
| 41. During this school year was session taken on healthy ways to lose weight?<br>a. Yes<br>b. No | 42. According to you which is the healthiest cooking method?<br>a. Boiling<br>b. Steaming<br>c. Frying<br>d. All of above |
| 43. Do you read ingredients written on the packaged food?<br>a. Always<br>b. Sometimes<br>c. Never | 44. Do you participate in sports activity?<br>a. Yes<br>b. No |
| 45. You are a member of<br>a. Nuclear family (living with parents and brothers and sisters)<br>b. Extended family (living with parents, grandparents, uncle, anti) | 46. Parental occupation (father)<br>a. Part time<br>b. Full time<br>c. Not employed |
| 47. Parental occupation (mother)<br>a. Part time<br>b. Full time<br>c. Not employed | 48. Mothers educational level<br>a. Primary (up to grade seven)<br>b. Secondary (up to grade 10)<br>c. Certificate or diploma<br>d. Degree or above |
| 49. Parents are married<br>a. Yes<br>b. No | |