Nutritional knowledge, Attitude and Practice of Female Teachers at Benghazi Primary School .

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NUTRITIONAL KNOWLEDGE , ATTITUDE AND PRACTICE OF FEMALE TEACHERS AT BENGHAZI PRIMARY SCHOOL

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بسم الله الرحمن الرحيم

(قالوا سبحانك لا علم لنا الا ما علمتنا انك انت العليم الحكيم)

صدق الله العظيم

سورة البقرة

Dedication

Dedicated to my loving family especially to my Mom and Dad for the patience, encouragement and support .

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Extend my sincere gratitude to the following individual whose efforts have contributed to the success of this research work, to start with, Prof. Tunis. M. Meidan for their tireless efforts in supervision and guidance.

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I would like to thank all the teachers who agreed to participate in the study and answered the question. We gratefully acknowledge for the time they spent completing the questionnaires.

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1. Research questionnaire

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Abbreviation

Abbreviation	Meaning
AHA	American Heart Association
ANKAA	Assessment of nutrition knowledge and food skills in talented adolescent athletes
BMI	Body mass index
CDC	Center of disease control and prevention
CHO	Carbohydrate
CVA	Cerebral vascular accident
CVD	Cardiovascular disease
FAO	Food agriculture organization
HDL	High density lipoprotein
HDS	Health and diet survey
HELENA	Healthy lifestyle in Europe by nutrition in adolescent
KAP	Knowledge, attitude and practice
LDL	Low density lipoprotein
SSB	Sugar-sweetened beverages
TEI , TER	Total energy intake , Total energy requirement

Nutritional knowledge, Attitude and Practice of Female Teachers at Benghazi Primary School

By Aziza khalifa Ali

Supervisor prof . Dr .Tunis M. Meidan

Abstract

Introduction: Nutrition-related diseases kill millions of Americans every year, and a major cause of these epidemics is that many consumers do not know enough about the role that foods play in health. There are many studies were aims for assessing the nutritional knowledge of the people. **Aim** : to assess the knowledge , attitudes and practice of female teachers . **Method:** Cross sectional study involving primary female teacher, a total of 500 of female teacher 486 completed the study, modified Standard questionnaire (K Parmenter and J Wardle 1999) carried out in primary school in Benghazi city during (1st February – 31th March 2014) which was developed to measure subject's nutrition knowledge, attitude and food habits, response rate 93% age (18 – 60year) most of the teacher have a University degree (40%). Data was collected by a modified stander questioner included socio-demographics, one-day (24 hour) dietary recall , (CHO, fat, protein energy),and body mass index (BMI) calculated. **Result :** About 0.4% were underweight with a mean BMI of 16.1 whereas about 23 % were of normal weight, 6.8% of the teacher was overweight while 4.7 % ware obese. Mean body weight 76 ± SD 17kg , mean height 161 ± SD 5cm , mean energy intake of teacher 824 kcal SD ±287 . Mean energy requirement per day 1648 SD ±222kcal . Mean CHO requirement 245 SD ±34.9g .Mean fat intake about 25 , SD± 19.5g .Mean fat requirement 45 SD± 6.5g .Mean protein intake 34 SD± 30g Mean protein requirement 8.9 SD± 61g . **Conclusion** :The participants have good knowledge on CHO, fat ,salt, fiber containing food and disease related. With low knowledge about antioxidant vitamin , protein and nutritional value of fruit juice as alternative to fruit . About 46% the teachers not sure when ask on the knowledge about nutrition related disease, the teachers required nutrition education to increased their knowledge ,and to participate in nutrition education programs, it could be increased their awareness about importance of healthy food ,like food contain antioxidant vitamin.

Chapter one

Introduction

1.1 Background

Understanding the reasons that influence food choices is essential for establishing effective ways to improve nutritional habits. These habits depend on various factors including socio-economic status, level of education, personal beliefs, food availability and nutrition knowledge. The latter factors differ widely among geographical areas which may contribute to the important variability in food choices among populations or within populations with different cultural backgrounds. Nutrition knowledge is not necessarily related to dietary behavior. In most studies in which the association between nutrition knowledge and dietary behavior has been analyzed, the association was found positive and generally weak most probably because cultural, educational, economic factors as well as food availability have an important influence on dietary behavior and food choices. Since the way in which nutrition knowledge transforms into dietary behavior and nutrient intake may vary.(Bingham et al.,2002).Urbanization, economic development and globalization have led to transitions in nutrition with the rapid changes in lifestyle and diet. Transition in nutrition is related to the consumption of foods with high energy content (foods with low fiber-content foods, containing sugar or sweetened foods), low levels of physical activity and sedentary lifestyles. Balanced and sufficient nutrition is of great importance for maintaining good health and for pursuing a quality life. The relationship that has been demonstrated between unhealthy nutritional habits and many chronic diseases emphasizes the preventive effect of correct nutrition .(Memis and sanlier , 2010) . Previous research has demonstrated that a wide range of factors can affect individual nutritional habits, including: characteristics such as age, gender, living place, and family structure , cultural factors, socio-economic status, occupation, beliefs and psychological. However, previous studies indicated that individuals have only a limited perceptions and knowledge about a healthy diet. Women, in particular, tend to associate a healthy diet with the energy values of foods. Recent years have seen a global rise in rates of obesity and obesity-related health. However, it would be a mistake to associate unhealthy or poor diet solely with obesity (Memis and sanlier , 2010)

In contrast, it is constantly emphasized that insufficient energy and food intake is a factor in the development of various diseases and that dietary arrangements have an important effect on in the treatment of diseases. Within turkey, one reason for an inadequate and unbalanced diet is the common unhealthy nutrition habits, related to various factors that prevent the most effective use of existing sources. Changes in nutrition habits are important in terms of individuals' health and the risk of diseases such as cardiovascular diseases, diabetes mellitus, and osteoporosis. In order to attain the desired quality of life in the rapidly globalizing world, awareness should be raised about nutrition and the emphasis on healthy diet should be adopted as a lifestyle choice. Adequate and balanced diet is important for physiological needs throughout life and for satisfying psychological and sociological needs (Memis and sanlier , 2010). There are many studies were aims for assessing the nutritional knowledge of the people. Depended on asked many questions related to knowledge on nutrition information, understand the importance of nutrients, knowledge of dietary recommendations for adult, and knowledge of the relationships between diet and disease (Bukusuba et al ., 2010) . To assess their attitudes towards nutrition recommendations the participant asked on eating various foods, consumption of fruits and vegetables, increasing meal frequency, and consumption of special diets (Bukusuba et al ., 2010). For assessing the dietary practices of the participants asked on number of meals consumed in the preceding 24 hours to the survey, and number of food-groups consumed, reported consumption of special diets, portioning of meals (Bukusuba et al ., 2010) .

Nutrition-related diseases kill millions of Americans every year, and a major cause of these epidemics is that many consumers do not know enough about the role that foods play in health. About two-thirds of adults and one-third of children and adolescents are overweight. Obesity raises the risk of many leading causes of death, including heart disease, cancer, and diabetes, according to the centers for disease control and prevention (CDC). More than twenty five million children and adults in the United States have Diabetes. Heart disease is the leading cause of death for both men and women.(Barnard et al ., 2012) . The concept of “balance diet” has been promoted by health administration for past several years. In order to obtain enough nutrients, it is necessary to select various types of foods and adequate quantity from the six major food categories daily. (Huang et al ., 2013)

It is important not only to obtain the basic nutrition and energy, but also follow the concept of balance diet. Furthermore, the department of health has endorsed the concept of "healthy diet" and enforces notions of "five vegetables and fruits a day" and "three less, two more" rules to alter people's eating habits and improve health (Huang et al ., 2013) .

Considerable changes in human lifestyle all over the world in the recent decades. Especially in recent years, the lifestyle has rapidly been changed. These changes appeared in diet, types of food, cooking time, etc. Nowadays processed foods are rapidly replacing organic food. Another change is the rapid increase in the number of restaurants and in people's tendency to eat fast food. Proper nutrition is one of the most important aspects of lifestyle (Elhassan et al ., 2013). The main goals of nutritionist is to broaden the knowledge about diet - disease related of the people in a society, the enhancement of the nutrition attitudes, knowledge and practices of its people is of high importance, as this will subsequently lead to a more food conscious society and more healthy people (Alshammari et al ., 2013) .

This study was, therefore, undertaken to assess the gaps in nutritional knowledge, attitudes, and dietary practices of the women and their interactions with socio demographic , anthropometric characteristics. The nutrition knowledge assessed focused on the three basic food groups and the nutritional practices were evaluated through the use of questionnaire , and twenty four hour dietary recall . The pattern of disease has changed as a result of change in lifestyle and nutrition. With this transition food intake has substantially increased and obesity became very common in the younger population. Several studies have shown that the choice of food is related to the individual's level of nutritional knowledge (NK).This has led programs aiming at obesity prevention to develop and implement more nutritional education activities. Knowing the level and determinants of NK would help guide these activities to aspects which are deficient and require improvement .(Alfaddagh and Al Isa ,2014).

.

1.2 Definition

Dietary intake: the amount of energy, nutrients available in the food consumed by the people (Hailesalssiek et al ., 2013).

Recommended nutrient intake : referred to as the reference daily intake is a term generally used to describe nutrient intake in regards to the majority of healthy people in a particular stage of life and of a particular gender (Hailesalssiek et al ., 2013).

Knowledge : is the capacity to acquire, retain and use information; a mixture of comprehension, experience, discernment and skill (Alshammari et al ., (2013) .

Attitude : refers to inclinations to react in a certain way to certain situation; to see and interpret events according to certain predispositions; or to organize opinions into coherent and interrelated structure (Alshammari et al ., 2013) .

Practice: mean the application of rules and knowledge that leads to action. Good practice is an art that is linked to the progress of knowledge and technology and is executed in an ethical manner (Alshammari et al ., 2013) .

Anthropometrics: measurement of the human body e.g. weight, height, BMI (komakech , 2010) .

Body mass index (BMI): is used as an indicator for adult nutritional status. BMI is an indicator that is supposed to reflect thinness, by measuring weight and controlling for height. BMI is calculated as weight / height m^2 (komakech , 2010) .

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1.3 Aim of study

To determine the nutritional knowledge, attitude and practices of female teachers at Benghazi primary school.

Objectives

1. To describe the socio- demographic, anthropometric and dietary assessment of female teachers.
2. To describe the knowledge of teacher on food groups and disease related .
3. To determine the dietary intake and nutritional status of teachers .
4. To describe the practice and nutritional attitude of teachers

Chapter two

Literature review

Study on association between nutrition knowledge and nutritional intake in middle-aged men from northern France. Public health and nutrition journal, which stated that higher nutrition knowledge (NK) results in healthier dietary intake especially, fruit and vegetables, cereals, dry vegetables, cheese and unsaturated fat. (Bingham et al ., 2000 ; Ahmed et al ., 2012)

Study on nutritional knowledge, opinions, and practices of coaches and athletic trainers at a division 1 university. International journal of sport nutrition and exercise metabolism showed a lack of specific nutrition education about weight control, adolescent's nutritional needs, and fat diet . (Richardson et al ., 2001 ; Azizi et al .,2010).

Study on the association between nutrition knowledge and eating behavior in male and female adolescents in the US, international journal of food sciences and nutrition, show a number of researcher suggest that nutritional behavior is related to nutritional knowledge and that if an individual is educated on healthy eating ,they are more likely to do this in practice . (Pirouznia , 2001;Burkhart ,2010)

Study to determine nutrition knowledge of collegiate athletes published in journal of American dietetic association, forty seven percent of males and , forty three percent of females incorrectly agreed that protein was the main energy for the muscle. (Jonnalagradadda et al ., 2002 ; Burkhart ,2010)

Study about sports nutrition for young athletes, published in journal of school nurses, the dietary practices of young athlete fail to meet the energy requirement for high performance and may also threaten their well-being. (Connie et al .,2005; Azizi et al .,2010).

Cross sectional study on nutritional knowledge, food habits and health attitude of Chinese university students, have shown that nutrition knowledge is positively and significantly correlated

with attitude. Although eighty five point six percent of students are aware of the concept of nutritionally balanced food, only a few numbers of students seven percent apply this concept when selecting food from a menu. only fifty one percent of students showed a desire to learn about healthy diets. (Amamoto et al ., 2005; Azizi et al .,2010).

A thesis about assessment of nutrition knowledge and food skills in talented adolescent athletes (ANKAA) , a presented in partial fulfillment of the requirement for the degree of master of science in human nutrition at Massey University, New Zealand , was done to investigate the nutritional knowledge of adolescent athletes ,asked about importance of carbohydrates and their roles in body , ninety fife percent of the subjects correctly agreed that carbohydrates are found in breads and cereals ,although only fifty seven percent correctly agreed that carbohydrates are found in fruit and vegetables ,only forty five percent know that sugar is a carbohydrate, and forty two percent knew that carbohydrates are stored as glycogen (Burkhart ,2010). The subject were asked to identify source of protein and the role that it play in the body , food source of protein were easily identified by subjects. Sixty five percent of the athletes that vegetarian could eat enough protein without consuming meat, seventy six percent of athletes know that milk and dairy product contain protein, and seventy six percent also knew meat was good source of protein, when asked in a different question forty three percent stated that low fat milk was high in protein . (Burkhart , 2010)

Study on nutritional practices and knowledge of college varsity athletes . Journal of strength and conditioning research, results indicated that only three percent, eleven point seven percent , and twenty nine point five percent correctly identified recommended percent of total calorie intake for protein, fat and carbohydrates, respectively; thirty seven percent correctly identified the role of vitamins and fifty four point four percent for protein . (Jacobson, et al, 2001;Ahmed et al ., 2012).

Study about nutrition knowledge and body mass index, health education research, to determine nutrition knowledge and body mass index of study subject show that nutritional knowledge affects the quality of food intake and also healthy choices of purchased food. The association of NK and healthy eating habits can be explained by the fact that individual exposure to new information may possibly arouse changes in attitude and consequently result in enhanced dietary behavior (Davies and O'Brien ., 2007 ; Ahmad et al .,2012)

Study on dietary behavior of pregnant versus non-pregnant women. Indicated that higher knowledge of pregnant women was not an indicator to cause them to change their nutritional habits (De Bourdeaudhuij and Verbeke , 2007 ; Ahmad et al .,2012)

Study for determinants of nutritional knowledge in young and middle-aged Belgian women and the association with their dietary behavior show that advancement of individual nutrition knowledge (NK) provides new information which may stimulate changing of attitude and subsequently result in enhancement of dietary practices (De Henauw et al ., 2009 ; Ahmad et al .,2012)

Study about relationship between nutritional knowledge and healthy attitude and practice during pregnancy, department of environmental sciences, Malayer University, Iran. The results of this study showed that nutrition knowledge of pregnant women was significantly associated with healthier choice of foods for their daily meal (lunch and dinner) and type of drinks, rare consumption of fast foods, and frequent consumption of chicken and healthy use of vitamin and mineral supplements (Ahmad et al ., 2012)

Relationship between nutritional knowledge and healthy attitude and practice during pregnancy, Malayer University, Iran, Borneo science, this study aim to examine if the nutrition knowledge (NK) of pregnant women effect on nutritional behavior, show higher level of NK contributed to healthier nutritional practices and positive attitudes.

Also maternal healthy nutrient intake during pregnancy may affect the wellbeing of expectant mother and developing fetus also health advice encouraged expectant mothers to improve their food intake (Ahmad et al .,2012)

According to one study (Nutrition knowledge, attitude and practice of teachers in rehabilitation centers in northern Malaysia; exposure to three day nutrition workshop, shows significant improvements in the teachers' nutrition knowledge and attitude after education (Chen ST et al .,2012 ; Alshammari et al ., 2013)

School-based health education strategies for the improvement of body image and prevention of eating problems among students showed that students with normal weight have a more healthy diet and better points in terms of nutrition knowledge and attitudes compared the others (O'DEA , 2004 ; Alshammari et al ., 2013)

Study on sports nutrition for young athletes. Journal Scandinavia Nutrition, have shown that most subjects are not familiar with the healthy foods needed for their body in different conditions (Connie et al .,2005 ; Alshammari et al ., 2013)

Study on nutritional knowledge predicts eating behavior of all food groups except fruits and vegetables among adults in the Paso Del Norte region. Journal of nutrition education and behavior, reported that the nutritional knowledge is significantly related with dietary habits including consumption of meat, dairy, grains and water (Day et al ., 2008 ; Alshammari et al ., 2013)

Study about body image, eating habits and practice exercises and attitudes of female adolescent students at Assiut University, medical journal Cairo University revealed that the medical students had a better understanding on the relationships between anemia, hypertension, obesity, food variety than that of other students ($P<0.05$) (Hoda et al ., 2010 ; Alshammari et al ., 2013)

A quantitative assessment of the cultural knowledge, attitudes, and experiences of junior and senior dietetics students , journal of nutrition education and behavior, concluded that knowledge scores were highest on questions concerning food habits and lowest on questions concerning health beliefs (Greathouse et al ., 2011 ; Alshammari et al ., 2013)

Study on nutrition and cancer prevention, knowledge, attitudes and practices among young Malaysians; to determine nutrition knowledge, attitudes and practices among young Malaysians demonstrated that nutrition knowledge plays a critical role in numerous pathophysiological conditions, including such prevalent diseases as diabetes, cancer, and cardiovascular diseases (Al-Nagger et al ., 2011 ; Alshammari et al ., 2013)

There were seven diseases which related to the inappropriate eating habit which were included in the ten leading causes of death in Taiwan; they were malignant, heart disease, cerebral vascular disease, diabetes, chronic hepatic disease, cirrhosis, and hypertension (Huang et al ., 2013) .More than three point five million women and children under age five in developing countries die each year due to the underlying cause of under nutrition .. Women are more likely to suffer from nutritional deficiency than men for several reasons, including their reproductive biology, low social status, poverty and lack of education. In addition, socio-cultural traditions and disparities in household work patterns can also increase women's chance of being malnourished (Hailesalssiek et al ., 2013).

A pilot study that was conducted to gauge the impact of nutrition education on the nutrition knowledge of primary school life orientation educators in south Africa baseline results showed that their general nutrition knowledge improved considerably as (63.3 ± 30.2% to 80.6 ± 21.1%) after the education program. This would be assumed to improve the nutrition education provided to the primary school learners and in this way improve not only learner, but also educators' nutrition knowledge and behavior (Egal et al ., 2012 ; Abrahms et al ., 2014)

A comparative study of knowledge, attitude, practice of nutrition and non-nutrition student towards a balanced diet in Hail University , journal of nursing and health science, have shown that not keeping a healthy diet and not having sufficient nutrition knowledge lead to issues such as health problems, overweight and obesity (Alshammari et al ., 2013)

Study on nutritional knowledge, attitude and practices among students of AHFAD university for women in Omdurman province show only forty six point three percent of students attempt to eat a healthy diet, thirty nine point four percent sometimes eat healthy food while fourteen percent of students don't even attempt to eat a healthy diet . (Elhassan et al ., 2013). About fifty fife point one percent of the students didn't know the food group that should be eaten the least . About thirty eight point three percent didn't know the three main components of food. Fifty two point six percent didn't know which foods contain more fibers. About sixty six pint six percent didn't know which foods contain the most calcium. About thirty five point one percent didn't know examples of food containing protein other than meat. About thirty eight point nine percent didn't know which foods contain carbohydrates. About forty six percent gave the wrong answers when asked to choose the true statement about fat. Large segment of students about seventy three point four percent didn't know the source of vitamin B twelve and iron. About sixteen percent of students didn't know that soft drinks have health hazards. About thirty fife point one percent weren't aware of the major health problems related to low intake of fruits and vegetables. About fifty nine point four percent answered incorrectly when asked to choose the best choice to reduce fat from the diet (Elhassan et al ., 2013).

The percentage of correct answers was higher among students studying medicine eighty eight point nine percent , pharmacy eighty six point seven percent and health science seventy one point one percent while the percentage of incorrect answers were higher among students studying psychology fifty eight point seven percent , rural extension fifty three point fife percent and students of the management thirty one point nine percent .

Study concluded lack of adequate nutritional knowledge among students. A significant association was found between the study field of students and their nutritional knowledge (Elhassan et al ., 2013).

Nutrition-related knowledge, attitudes, and dietary behaviors among head start teachers in Texas. A cross-sectional study, was implemented by head start educators who teach the nutrition education curriculum and encourage healthy eating behavior .This educator health behavior survey assessed behavior of predominantly African Americans on diet, usual meal consumption, and time spent on being physically active and sedentary, dietary practices and their knowledge and attitudes on nutrition and health. The survey results indicated that the head start educators' nutrition knowledge was poor, as none of them could correctly answer all of the nutrition knowledge questions; only three percent and about eighteen percent correctly answered at least four and three nutrition questions, respectively.(Byrd et al ., 2013 ; Abrahams et al 2014) . Only thirty eight point fife percent of educators correctly answered that at least five fruit and vegetables should be eaten daily. Breakfast, lunch and dinner was eaten 'always or almost always' by fifty seven percent ,seventy fife and seventy nine percent of educators, respectively. In addition, their nutrition behavior indicated towards the consumption of high fat foods and low fruit and vegetables**.** Eighty-eight percent of educators had ever tried to lose weight and as much as seventy one percent had been trying to lose weight at the time of the survey. Seventy-eight percent agreed that excessive weight increased health risks (Byrd et al ., 2013 ; Abrahams et al ., 2014).

A longitudinal study in one hundred urban and rural schools in the Western Cape Province, a survey among primary school educators from low-income settings, found them to be overweight thirty one percent and obese forty seven percent . Teaching is a stressful profession and there is evidence that this is related to poor health outcomes, such as cardiovascular morbidity.

The most common self-reported health problems among teacher in the public sector were high blood pressure fifteen point six percent , stomach ulcers nine point one percent and type two diabetes about four point five percent .

Health promotion among this group of individuals is thus important as it may help them to manage and improve their personal health by imparting nutritional knowledge and skills to achieve better overall health (Damane , 2013; Abrahams et al ., 2014).

Nutrition knowledge among a sample of urban black and white South Africans. South African journal of clinical nutrition, reported on the gaps in nutrition knowledge in a sample of ninety urban black and ninety urban white south Africans (eighteen years and older) in Limpopo province through a telephone survey. This study aimed at particularly determining the level of nutritional knowledge in this urban population. The survey found that both groups, black and white, had reasonable knowledge of diet recommendations and nutrient sources. They were, however, less knowledgeable about the relationship between diet and disease and about choosing healthy foods daily. The white group illustrated more general nutrition knowledge than the black group. The participants did not appear to use dietary recommendations to make healthy food choices daily (Peltzer et al ,. 2004 ; Abrahms et al ,.2014)

Study on dietary intake, perceptions regarding body weight and attitudes toward weight control of normal weight, overweight, and obese black females in a rural village in South Africa, most women did not see the connection between health and food intake. Also unhealthy eating habits or eating too much was identified by most participants as the reason for weight gain (Faber and kruger ,2005; Abrahms et al ., 2014).

Chapter three

Methodology

3.1 Type of the study

Cross - sectional study.

3.2 Study period

Data collection was carried out during the period 1st February to 31st of March 2014.

3.3 Study location

The study was carried out at the primary schools in Benghazi city.

3.4 Study population

The study target population was primary school female teachers at Benghazi city, about ten schools inter the study, from each school select fifty teachers .

3.5 Inclusion criteria: were any teacher affiliated to the chosen schools with any teaching specialty who agree to participate in the study.

3.6 Exclusion criteria: were those who were absent, refused to fill or incompletely filled the questionnaire

3.7 Sample size :

A total of female primary school teachers in Benghazi of 15000 . According to random table (Morgan and Krejcie 1970) the sample size determine as 500 .

3.8 Response rate:

The number of questioners that distributed was five hundred , about 468 of teachers completes the study with response rate ninety three percent .

3.9 Research instrument (Questionnaire)

The questionnaire (appendix I) was administered to the primary schools teachers by the researcher after the translation to Arabic from the modified standard questionnaire (Parmenter and Wardle , 1999). .It was distributed among the participants to get the necessary information, filled out by female teacher and collected.

3.10 Research measurements:

3.10.1 Socio-demographic information

The target population of this research consists of all female teacher defined between age eighteen to sixty years , also the martial statues, nationality , number of children , knowledge on nutrition and it is relation with disease ,education level determine .

3.10.2 Anthropometric measurements

The nutritional status of the teachers was assessed using weight, height and body mass index (BMI) as indicators of energy balance in adults ,height(cm) was measured by using tape masseur, the participant without shoes with shoulder in normal position , weight (kg) was measured on a battery powered digital scale , removed their shoes, and wore light clothing, to avoid variability among the data collection , all the anthropometric measurements was taken by the researcher. Body mass index (BMI)as calculated by dividing the weight in kilogram to the height in meter squared (kg/m^2) (komakech , 2010) .According to world health organization (WHO) definition of obesity, BMI above thirty is considered border of the obesity as table (3.1). (Azizi et al ., 2011)

Table (3. 1) : Classification of weight status by body mass index.

Classification	BMI (kg/m^2)
Underweight	<18.5
Normal weight	18.5 –24.9
Overweight	25 – 29.9
Obesity Class 1	30 – 34.9
Obesity Class 2	35 – 39.9
Extreme Obesity Class 3	> 40

3.10.3 Dietary intake assessment

One-day (twenty four hour) dietary recall was collected from of study participants**.** The nutrient and energy content of foods (carbohydrate , fat, protein) consumed by the teacher was calculated by the food composition tables, total energy requirement estimate by used Harris - Benedict equation (Harris and Benedict 1918) The total carbohydrate requirements are expressed as a percentage fifty percent of the total energy intake, protein requirement expressed as thirty percent and fat twenty percent of total energy intake calculated by used online program for estimated daily macronutrient requirement (Dilauri and jon , 2017)

3.11 Statistical analysis : was carried out using SPSS for windows version 23 .

3.11.1 Descriptive statistics : Mean, Medium, stander division were used to describe the demographic factors, socio-economic factors, nutritional knowledge, attitudes and practices, data presented by table and figure by using Microsoft excel (2010) .

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3.11.2 Inferential statistics : Chi square test was used , p values less than 0.05 were considered as significant .

3.12 Pilot study: modified Stander questionnaire (Parameter and Wardle 1999) , tested by pilot study and the questions were translated to Arabic and modified according to food and nutrition culture. like kippers, I add fish .and coconut oil remove and add butter .

3.13 Ethical considerations: the nature of the study was fully explained to the study participants to obtain their oral informed consent prior to participation in the study.

Chapter four

RESULT

(4.1) Socio - demographic characteristics of female teacher .

Thirty nine percent point one of teachers were aged between thirty one and forty years old, about twenty one percent were aged between twenty one and thirty years old ,point four of participant aged between eighteen and twenty years old , about thirty three point three percent of teachers aged between forty one and fifty years old ,and about six point two percent of teachers aged between fifty one and sixty years old with mean age 38 ± 8 year.

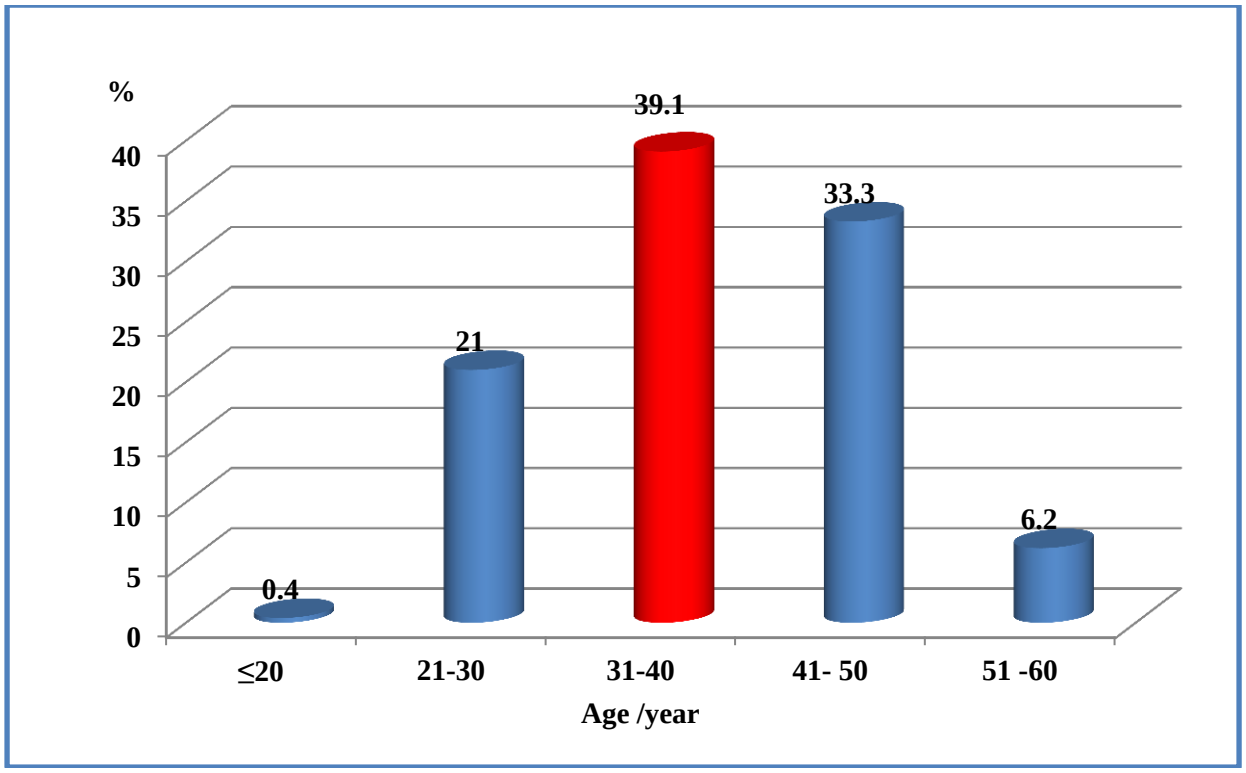

Figure 4 .1 : Distribution of sample according to age /year

Mean age = 38 years. St. Deviation =8 Median=39 years.

Minimum = 18 years. Maximum = 57 years.

The majority of teachers were Libyan (99.6%) , and non-Libyan (0.4%).

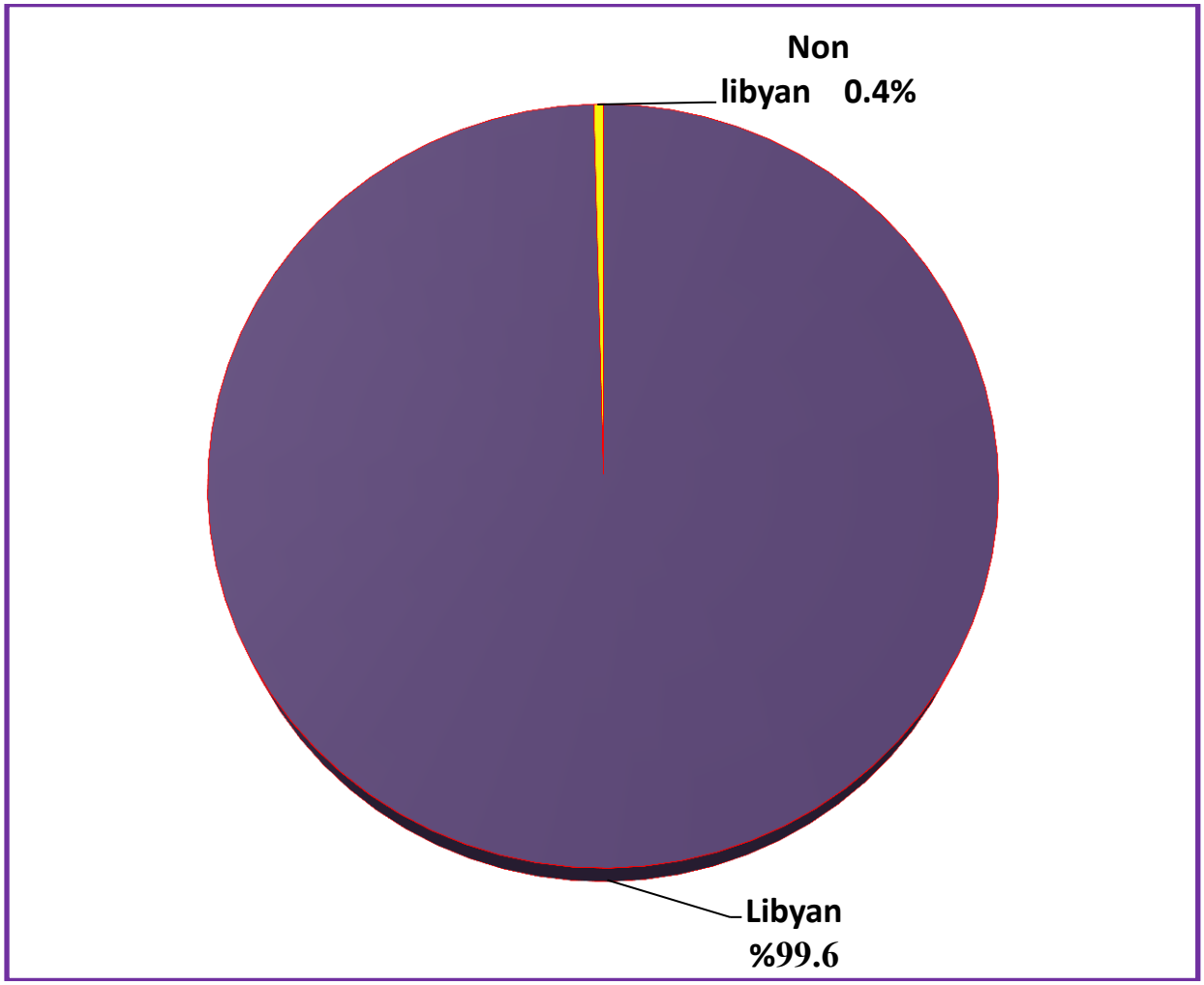

Figure 4.2: Distribution of sample according to teachers nationality.

The majority of the teachers sixty one point five percent was married while two point one percent widows, thirty one point five percent single , and four point nine percent divorce

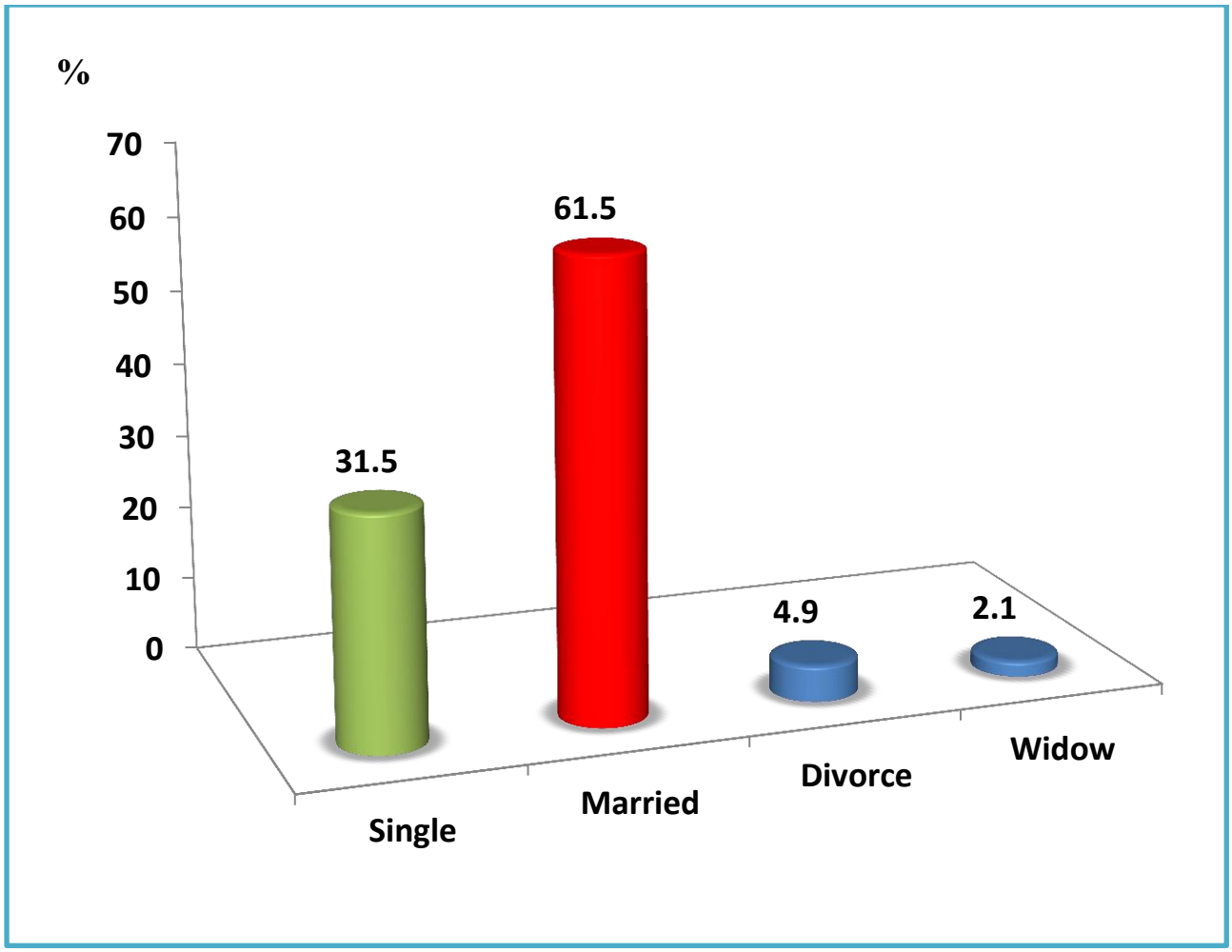

Figure 4.3 : Distribution of sample according to social statues.

Eight point three percent of teachers do not have children , about thirty one point two percent have one to three child , about twenty six percent have four to six child, about two point eight percent have seven to nine child .

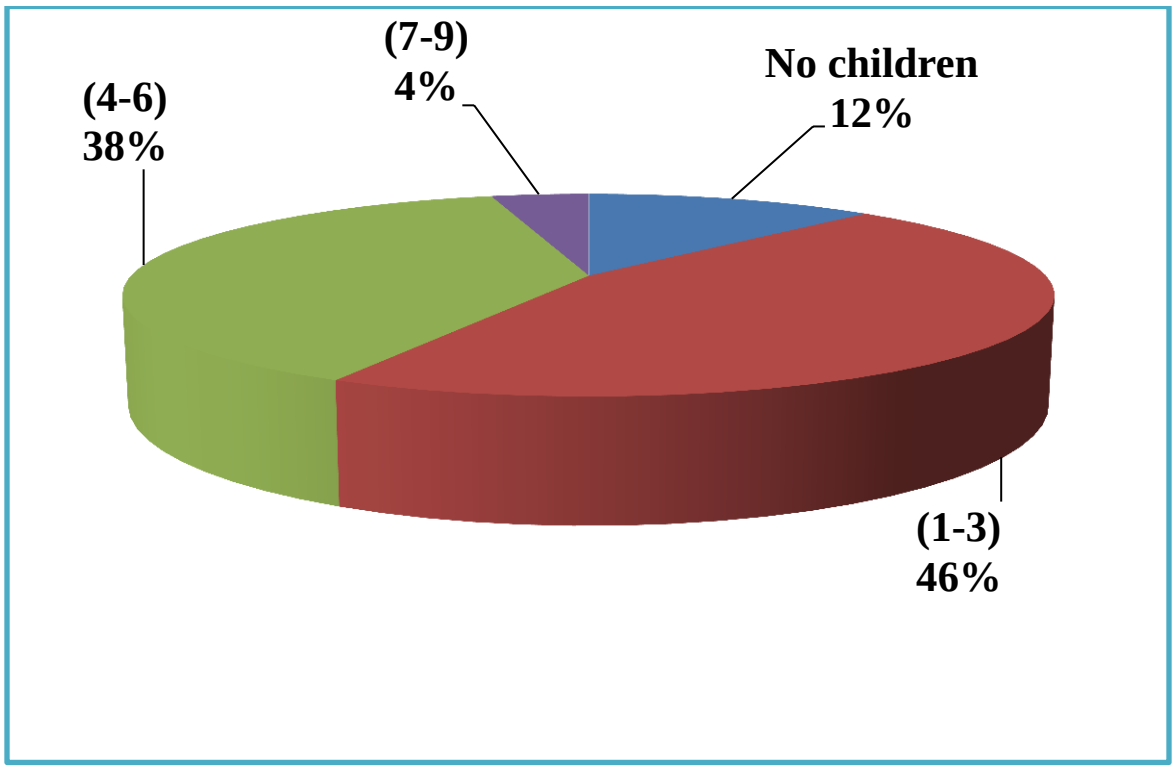

Figure 4.4 : Distribution of sample according to children number .

Mean =2 Median = 2 St. d =2 Manimum = 0 Maximum = 9

In the present study education level of teachers was diploma thirty one point two percent and high diploma about twenty five point two percent and most of teachers had university level about forty point six percent and other three percent.

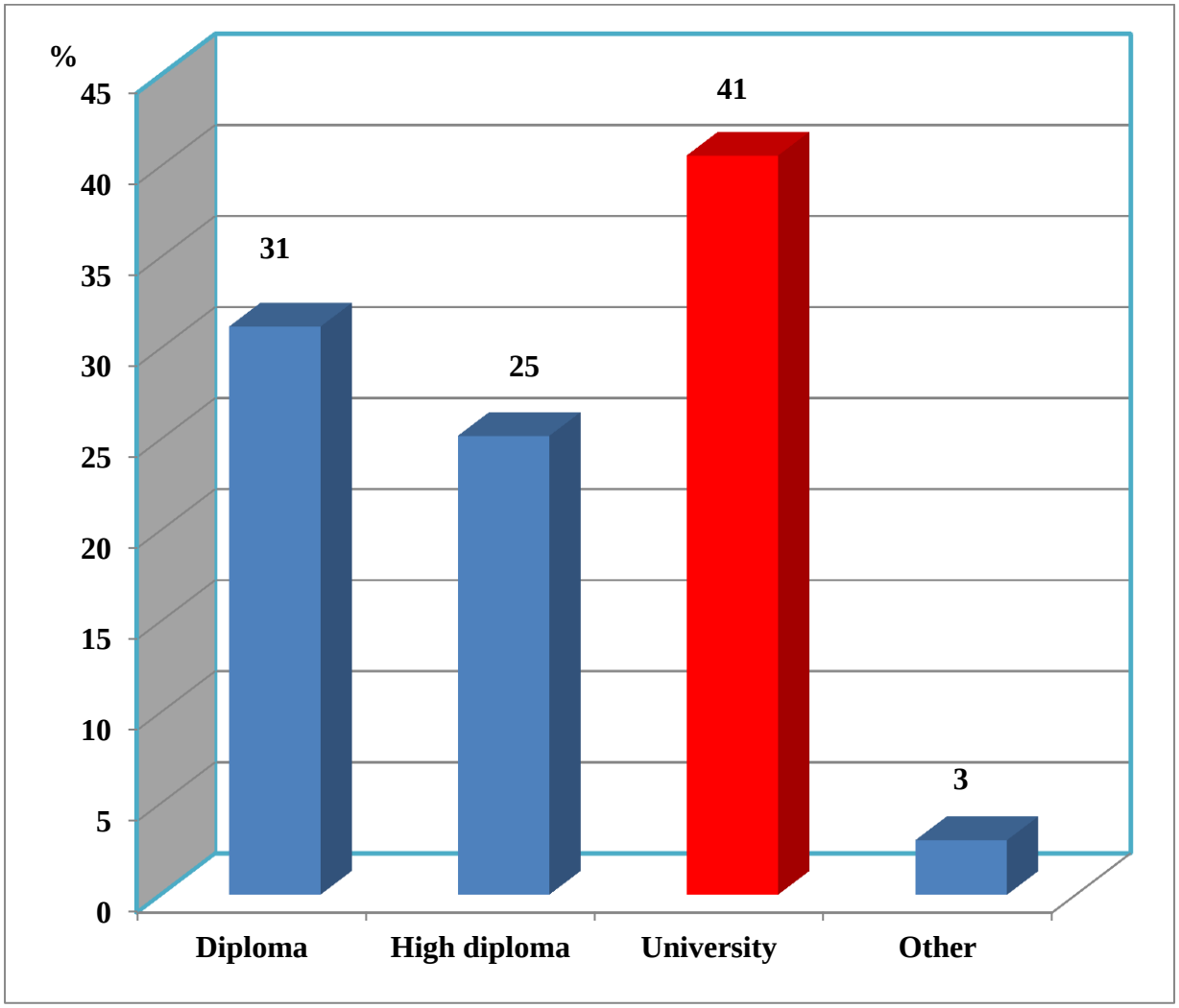

Figure 4.5 : Distribution of sample according to education level.

(4.2) Anthropometric measurements .

The sample distributed according to weight (kg) with mean body weight 76 ±17kg .about 58 % of teachers had Wight between 71-101 kg .

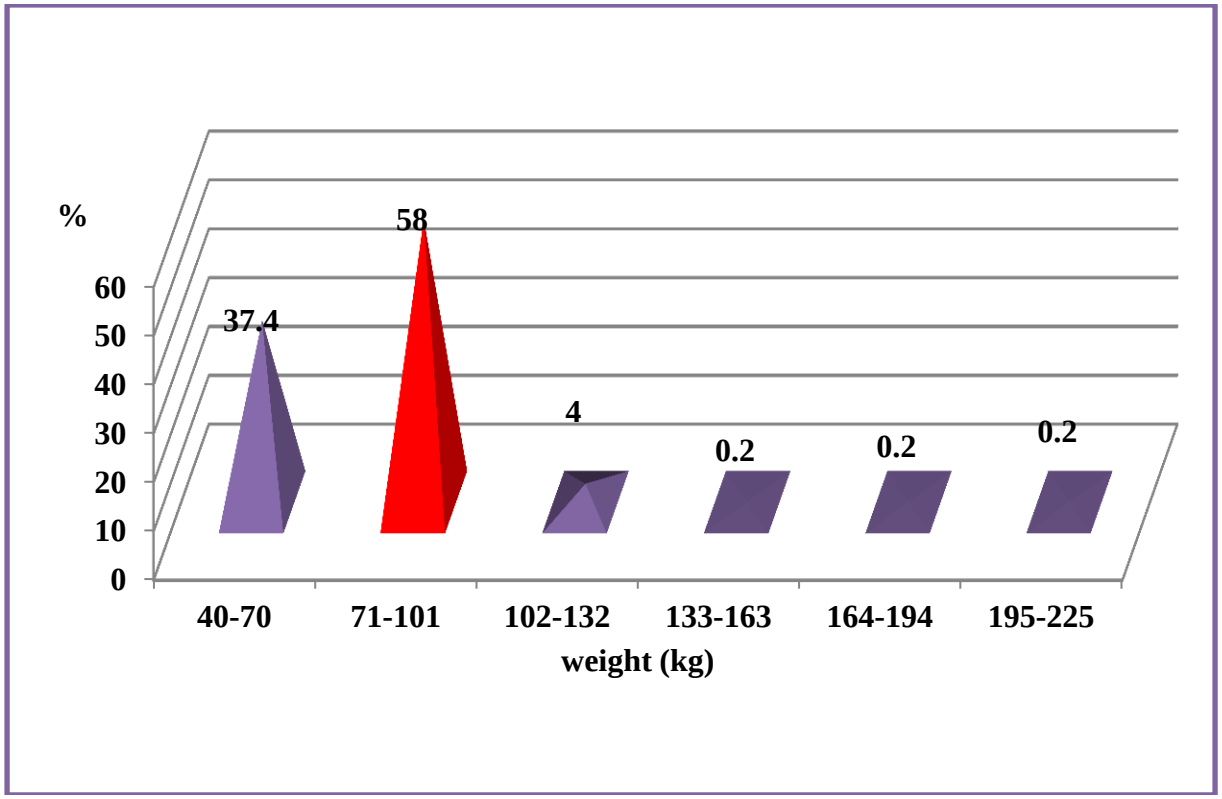

Figure 4.6 : Distribution of sample according to weight (kg).

Mean =76 kg Medium =75kg Std. deviation =17kg
Minimum = 40kg Maximum 197kg .

It was found that out of the 468 teacher about point four percent were underweight with a mean BMI of about sixteen point one , whereas twenty three point three percent normal weight, about seven percent of the teacher was overweight about twenty eight point six percent pre obese ,while four point seven was obese. According to BMI findings, majority of women were pre obese .

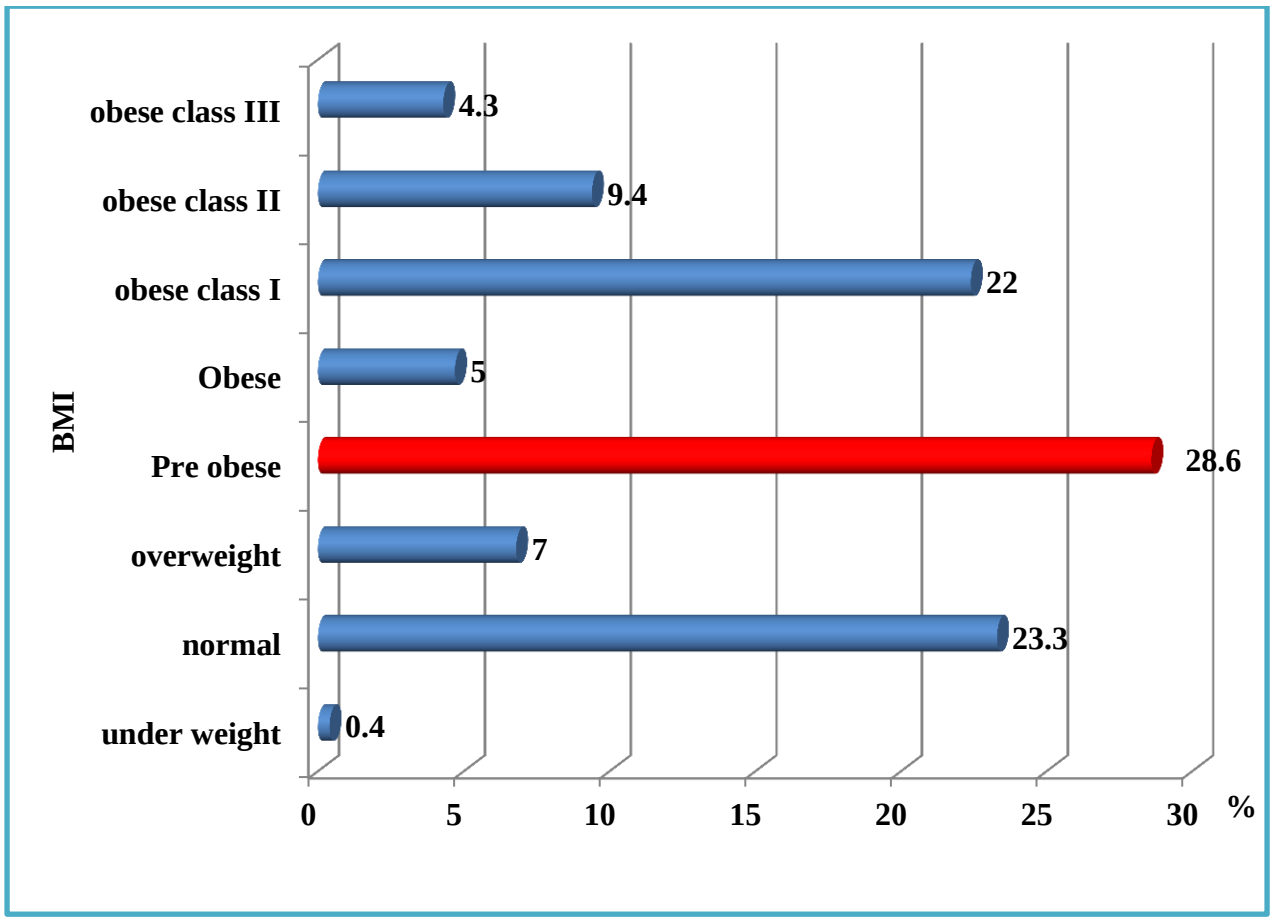

Figure 4.7 : Distribution of sample according to body mass index (BMI) .

Mean =28.9 Median = 28 St .d= 6 Minimum =17
Maximum = 68 .

3.4 Dietary assessment

Mean energy intake of teacher 848 ± 287kcal ,. no association between energy intake and the BMI of respondents at 0.05 level of significance (p=0.8) .The dietary assessment from twenty four hour food record showed that the energy and almost all nutrient intakes of the women in the study area were below the recommended nutrient intakes

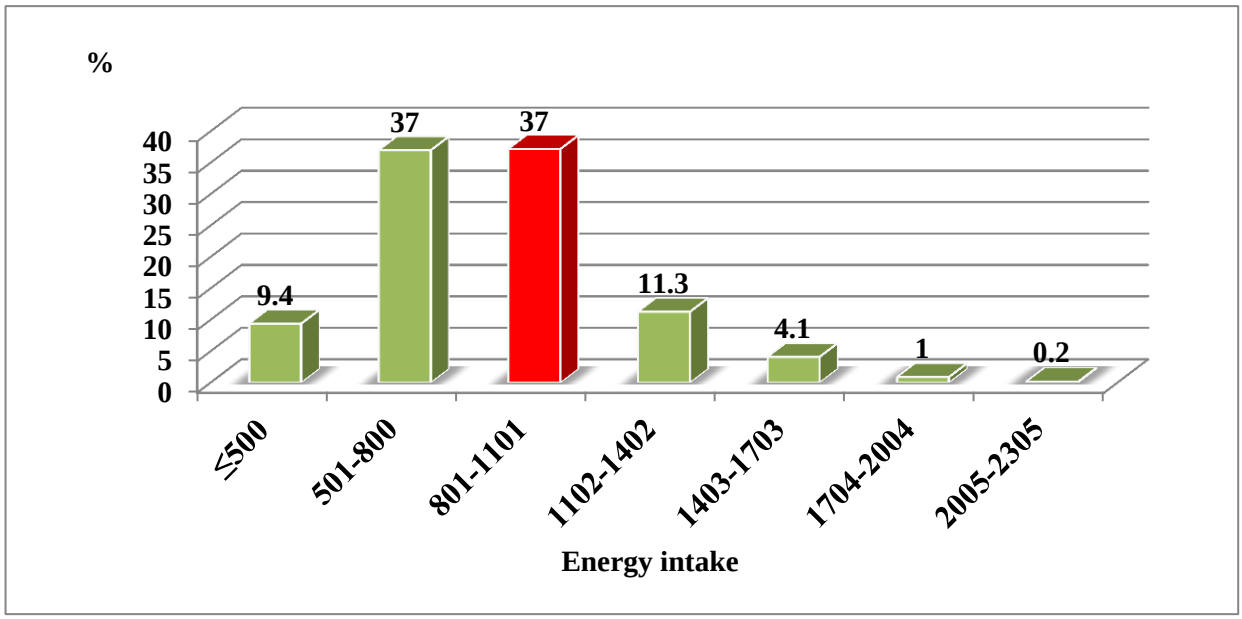

Figure 4.8 : Distribution of sample according to energy intake (kcal)

Mean= 848kcal Median= 824kcal St d .d =287 Minimum =320kcal

Maximum=206 kcal.

Mean energy requirement per day about 1648 ± 222kcal, about 33% of teachers consumed 1402-1602 kcal /d during the day before the study. and 28 .2% of them consumed about 1603-1803 kcal /d

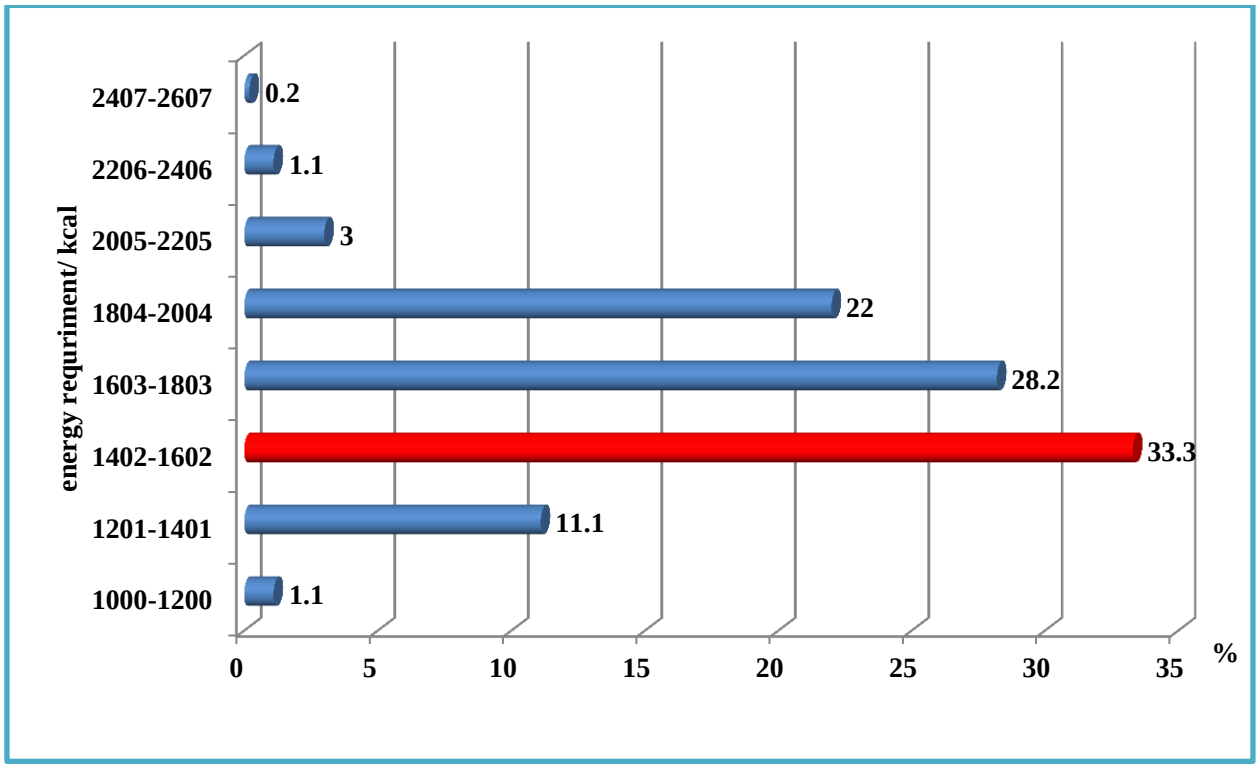

Figure 4.9 : Distribution of sample according to total energy requirement

Mean= 1648.8 kcal Median= 1632kcal St d .d =222.7kcal

Minimum =1021kcal Maximum=2480kcal

About 58% of teachers consumed 91-161 g of CHO in the day before the day of study , 25% concumed about 162-232 g , 10 % cuncumed 20- 90 g of CHO.

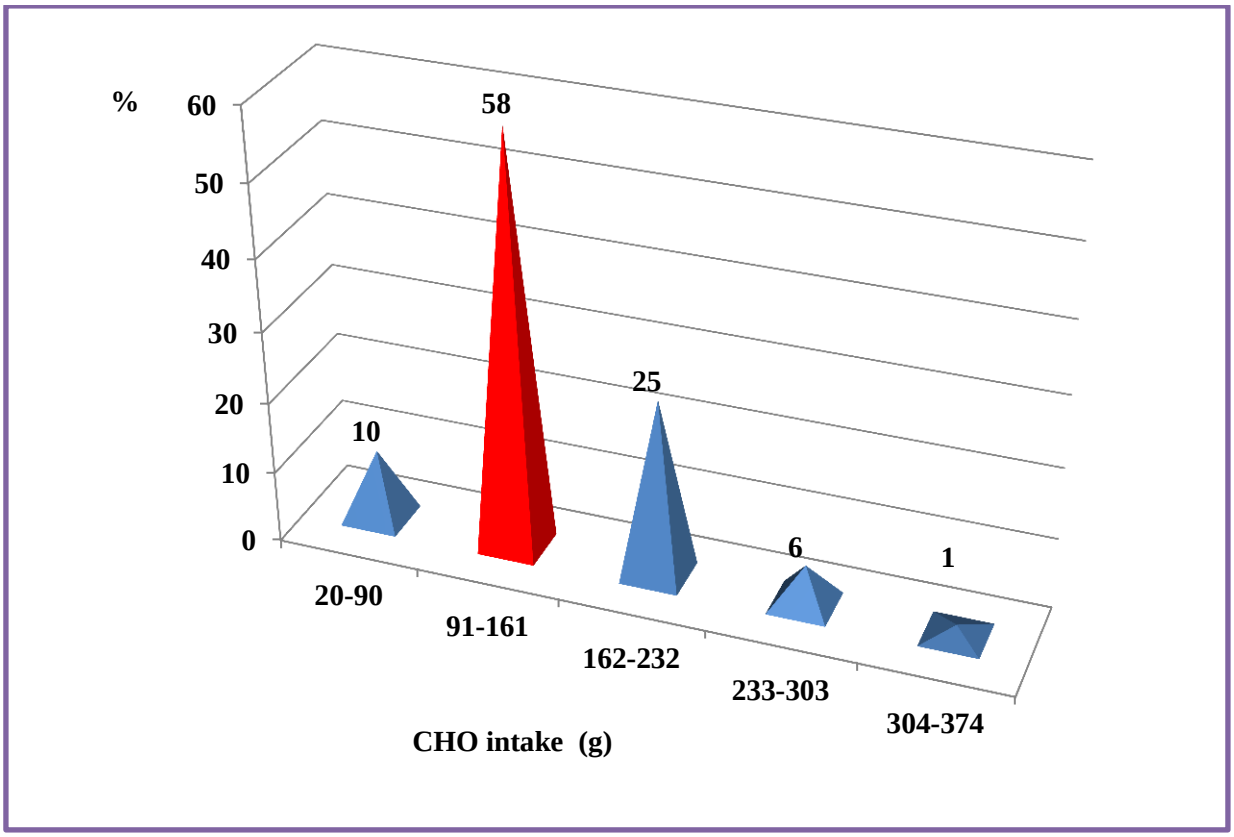

Figure 4.10 : Distribution of sample according to carbohydrate intake (g).

Mean = 150 g Median = 142g St D. d = 52.8g

Minimum = 20g Maximum = 344g.

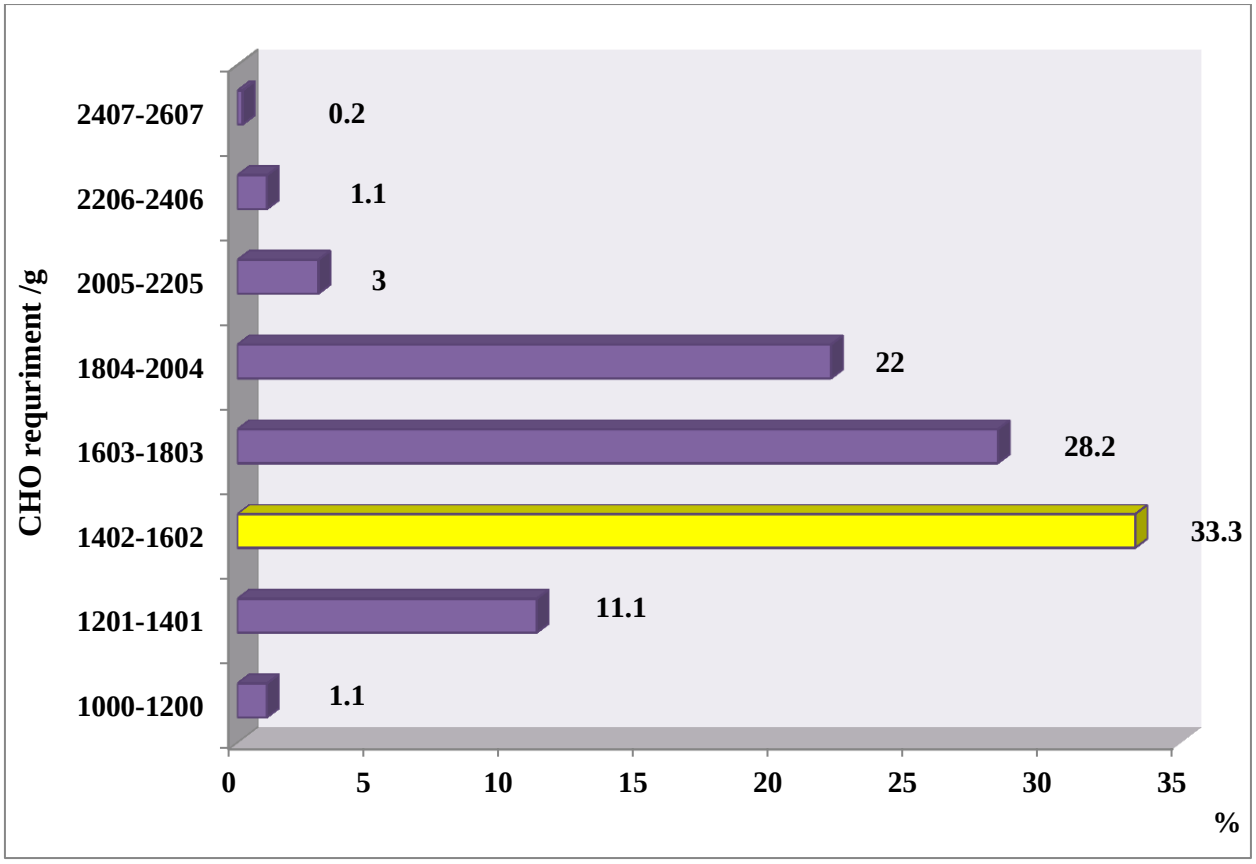

Figure 4.11 : Distribution of sample according to dietary carbohydrate requirement

Mean = 245.7g Median = 244g Std. d= 34.9g Minimum =106g

Maximum = 372g

About 67% of teachers consumed 11-51 g of fat /d , 21 % consumed < 10 g of fat , 10 % consumed 52-92 g of fat per d .only 1% consumed 93- 174 g of fat /d

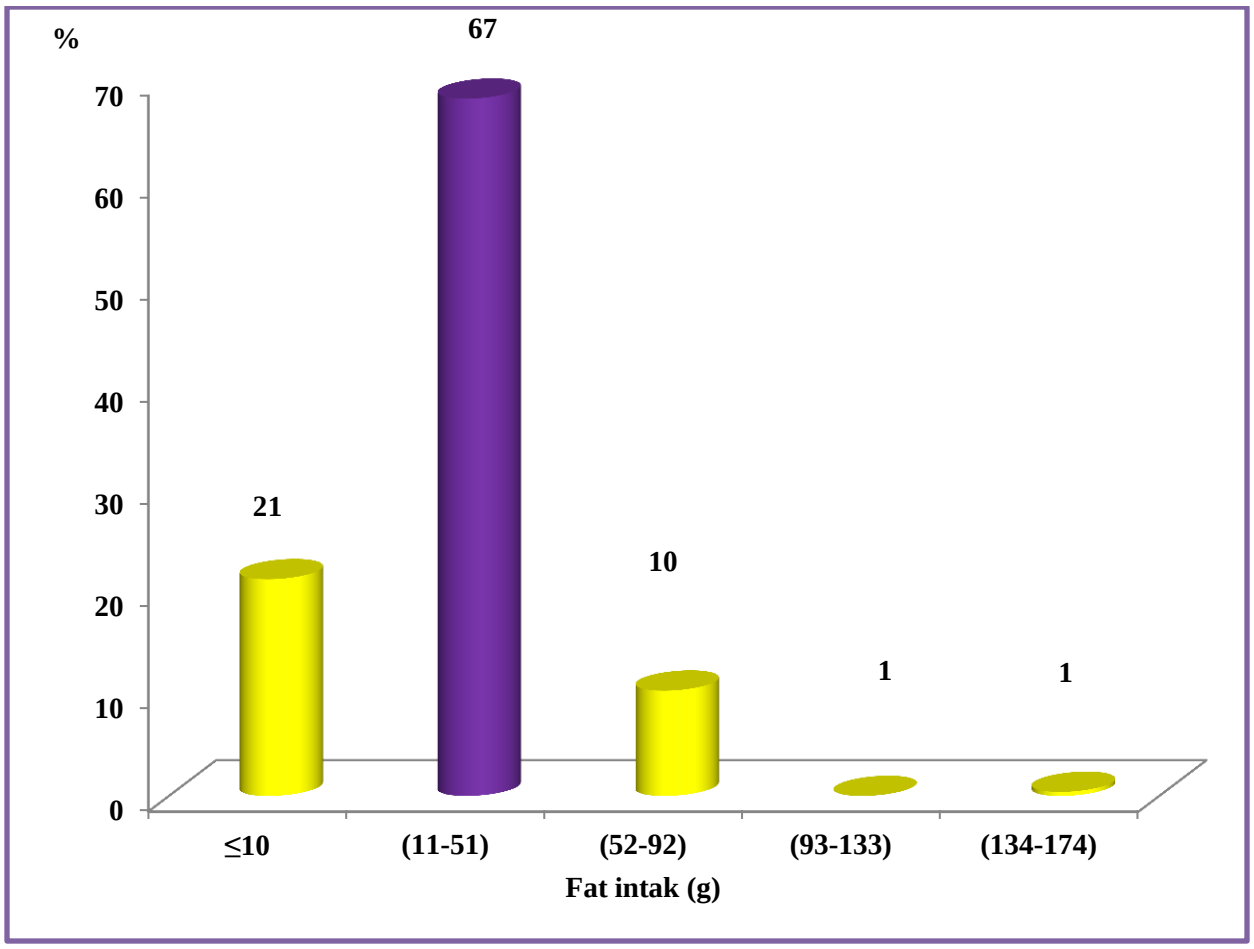

Figure 4.12: Distribution of sample according to fat intake(g) .

Mean =25g Median =20g Std. d=19.5g Minimum =3g

Maximum= 155g .

About 59.2% of teachers consume about 42 -52 g of fat according to body weight , height, physical activity and health struts ,29.1 consumed 31-41 g , 10% consumed about 53- 63 g of fat per day .

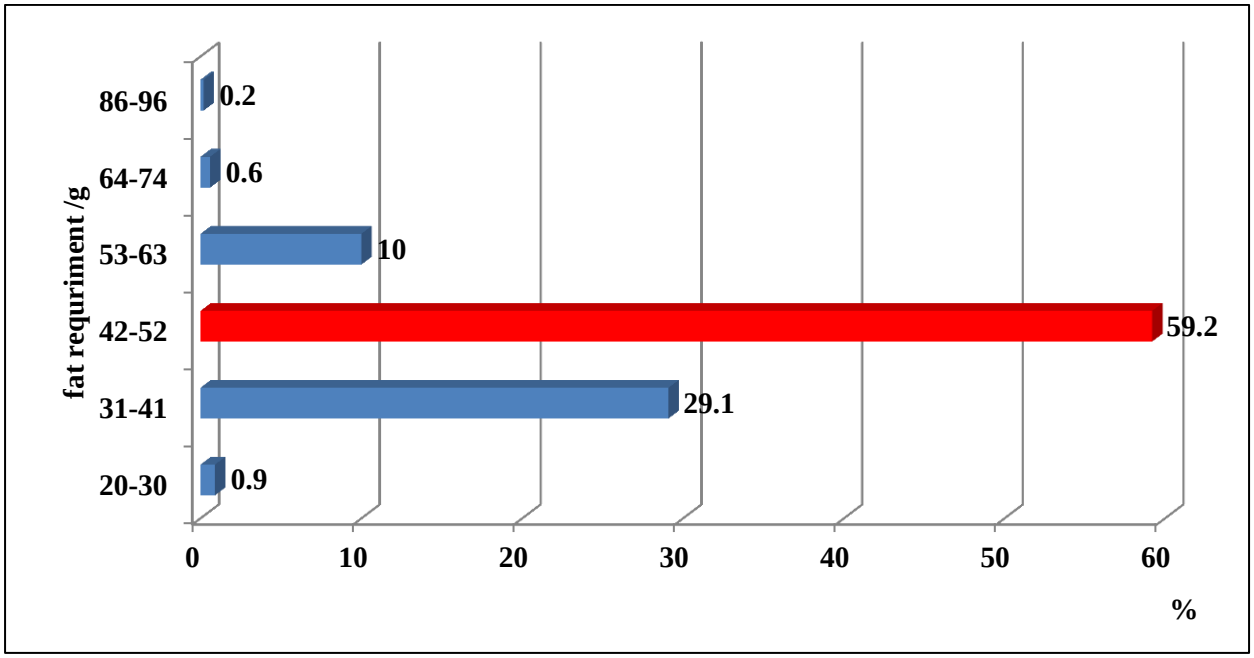

Figure 4.13 : Distribution of sample according to dietary fat requirement
Mean = 45g Median= 45g Std. d= 6.5 Minimum =21g Maximum = 89g.

About 65 % of teachers consumed 11-51 g of protein per day ,25.6 % consumed between 52-92 g of protein /d , 4.9% consumed 93- 133 g pf protein , 1.1 % consumed 134- 175-215g of protein and only 0.2 % consumed 216-256 g of protein / d .

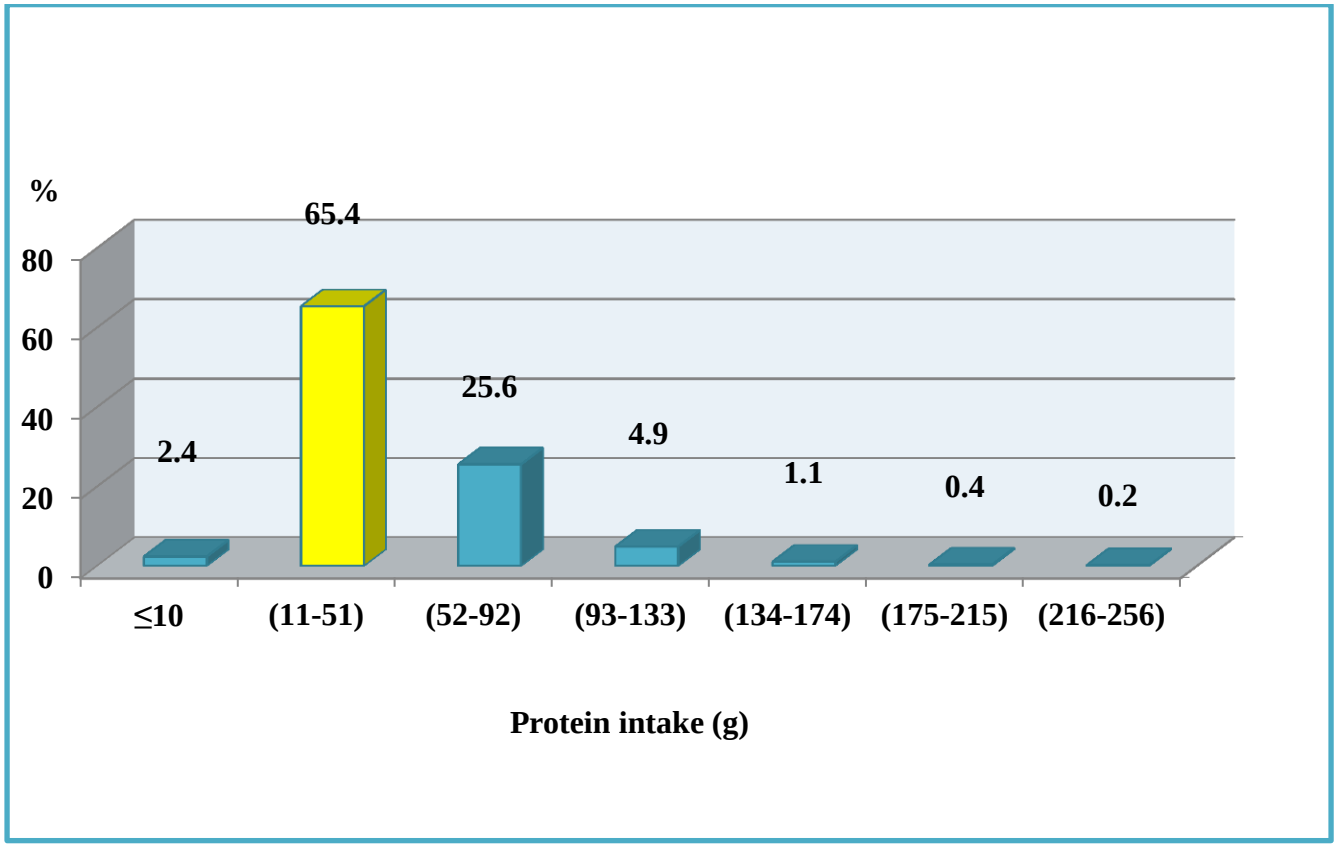

Figure 14.4 : Distribution of sample according to protein intake (g).

Mean =43g Median =37g St . d =30g Minimum =8 g Maximum=242g.

About 50.4% of teachers consumed 41-61 g of protein /d ,and 47.6 % consumed 62-82 g /d about 0.9 % consumed 20-1.03 g of protein /d only 0.2% consumed 104- 124 g of protein / d

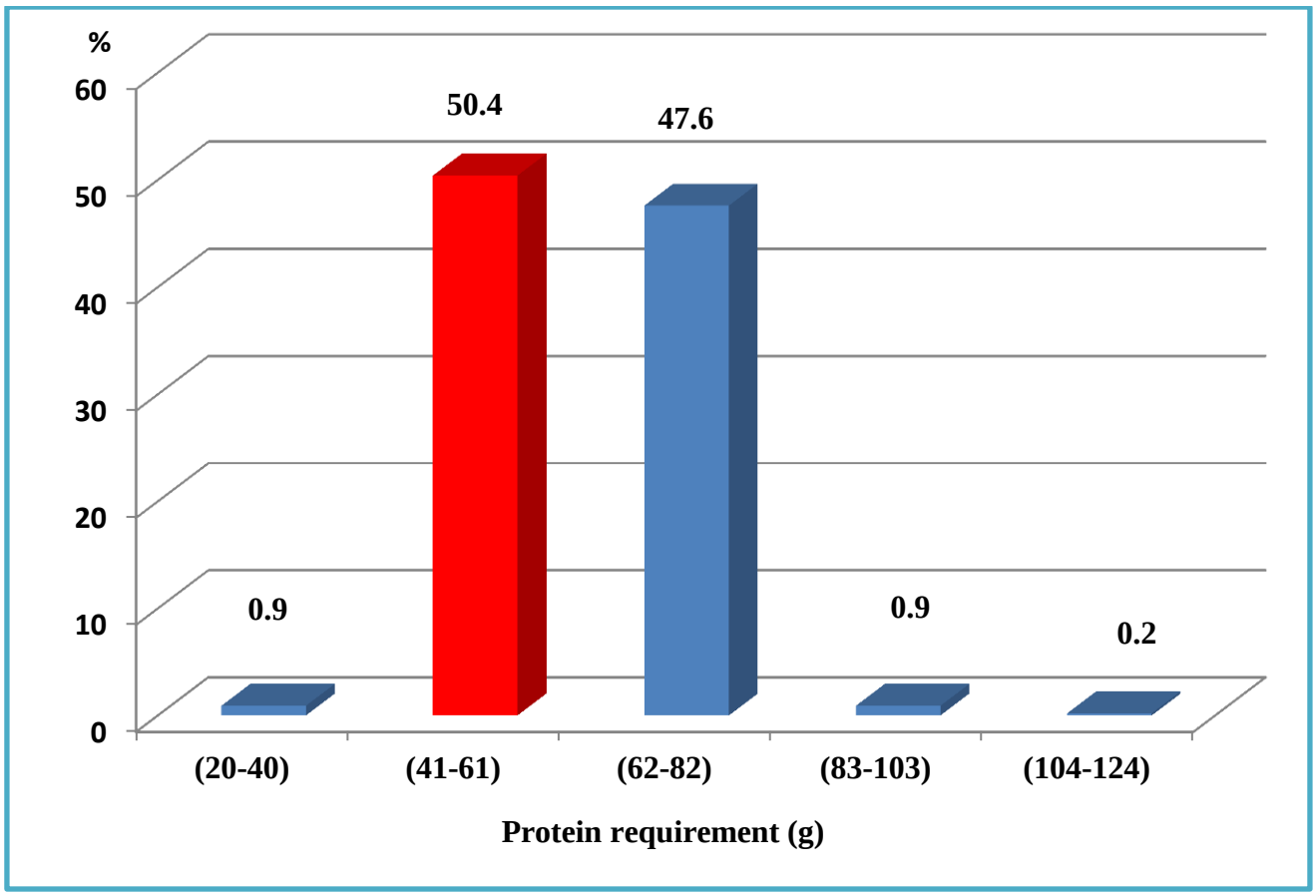

Figure 4.15 : Distribution of sample according to dietary protein requirement (g) .

Mean = 61.5g Median= 61g Std. d= 8.9

Maximum = 120g Minimum =27g

(4.4) Nutritional Knowledge of teachers.

The majority of teachers select not sure when asked about the knowledge on nutrition disease related , this meaning the teachers required education about relation between food and health and to increase their knowledge about nutrition disease related.

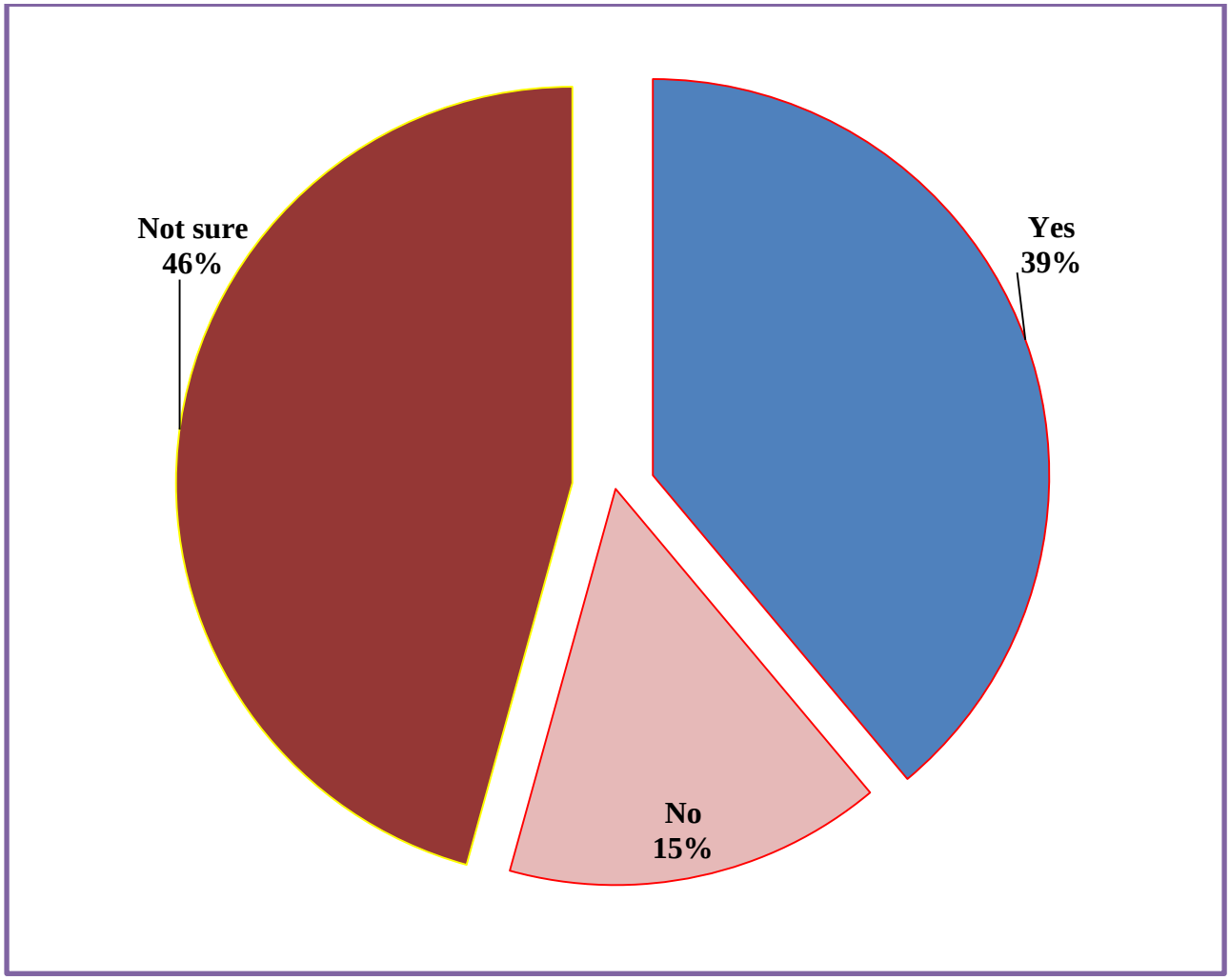

Figure 4.16 : Distribution of sample according knowledge about nutrition – disease related .

The teachers asked about fat type that must be cut down ,seventy five percent answered animal fat must be cut down, eleven percent vegetable fat must be cut down, fourteen percent not sure. This meaning most of teacher had good knowledge about fat type that can consumed .

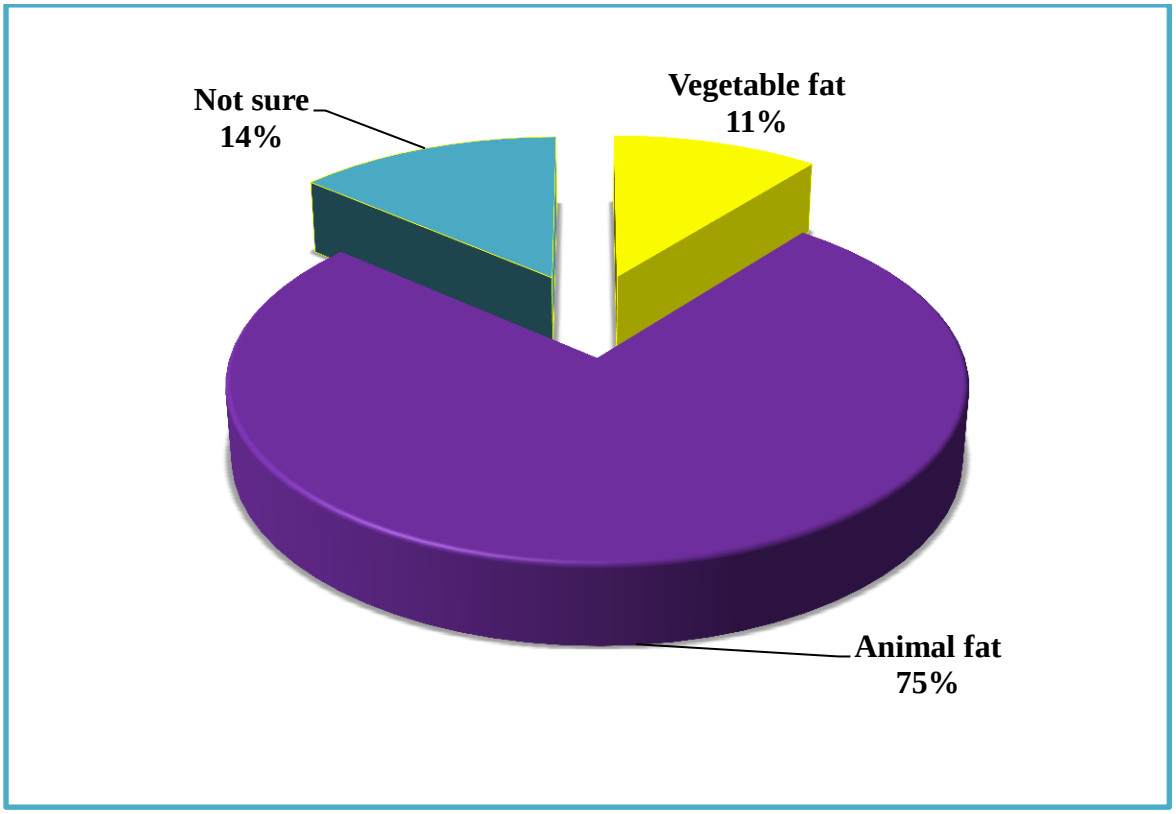

Figure 4.17 : Distribution of sample according to fat type that most important for people to cut down on.

The teachers asking about version of dairy foods that people should eat about sixty five percent stated low fat source should eat, seven percent full fat , mixed eighteen percent , dairy product should be cut down one percent, not sure nine percent , most of teachers concerned the low fat option more healthy .

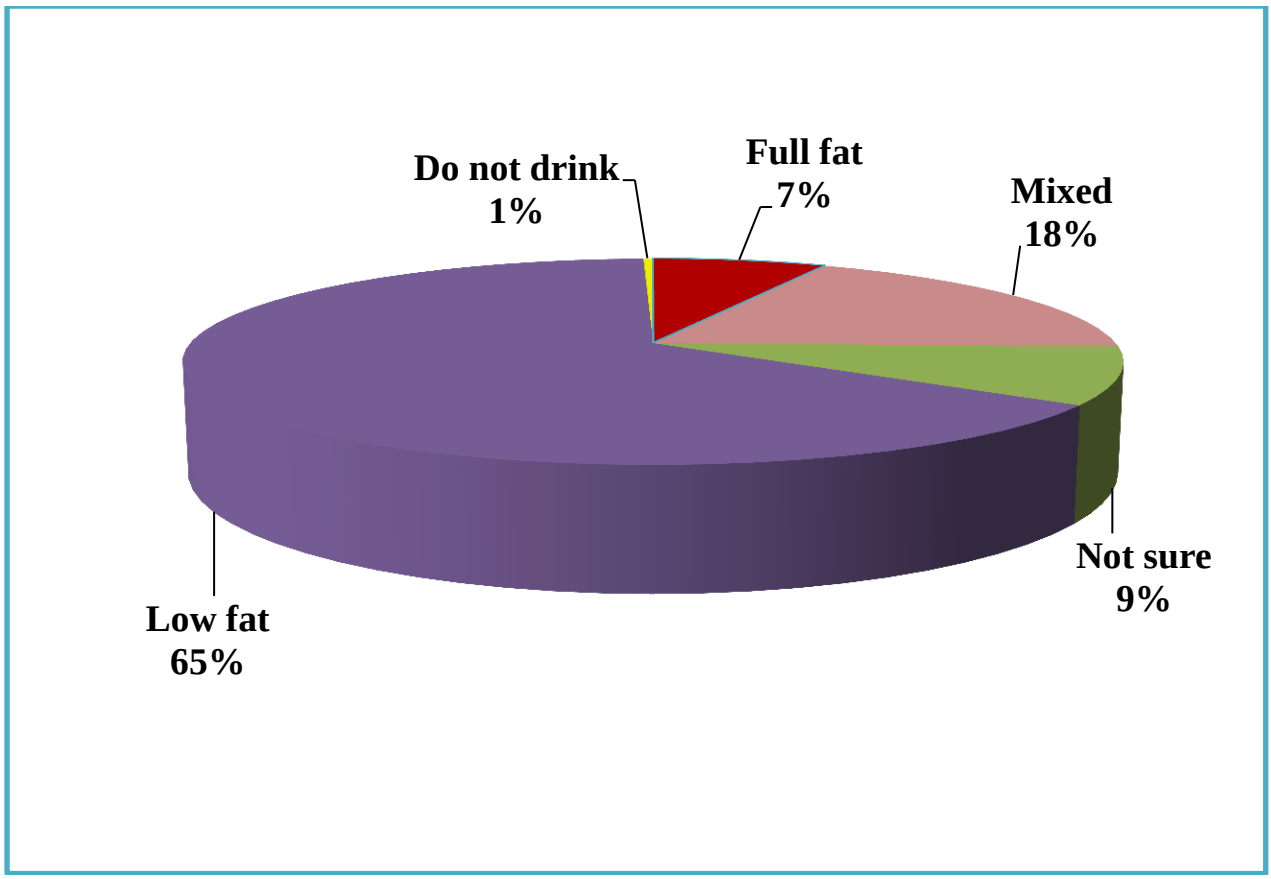

Figure 4.18 : Distribution of sample according to dairy foods that people should eat .

The participant asked on some foods contain a lot of fat but no cholesterol , sixty seven percent stated" yes " , twenty seven point stated " not sure " , six percent stated "no" . the teachers had good knowledge about this topic because many studies demonstrate the cholesterol found in animal sauce only and plant contain other type of fat not cholesterol

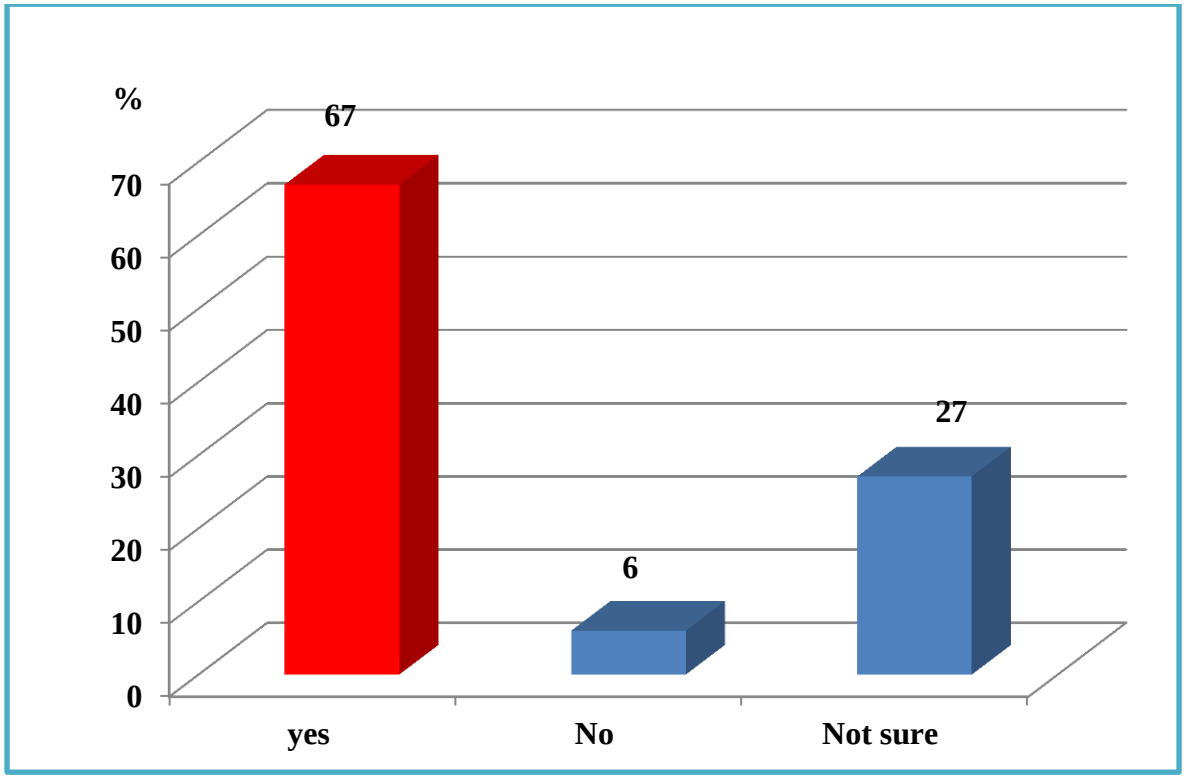

Figure 4.19 : Distribution of sample according to knowledge about food contains fat but not cholesterol .

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The participant asked about fat content in margarine and butter , seventy two percent of sample stated yes that margarine contain less fat than butter, fifteen percent stated no , thirteen percent not sure the question show the teachers have good knowledge on fat because the buuter contain most energy than margarine and also there is difference in type of fat .

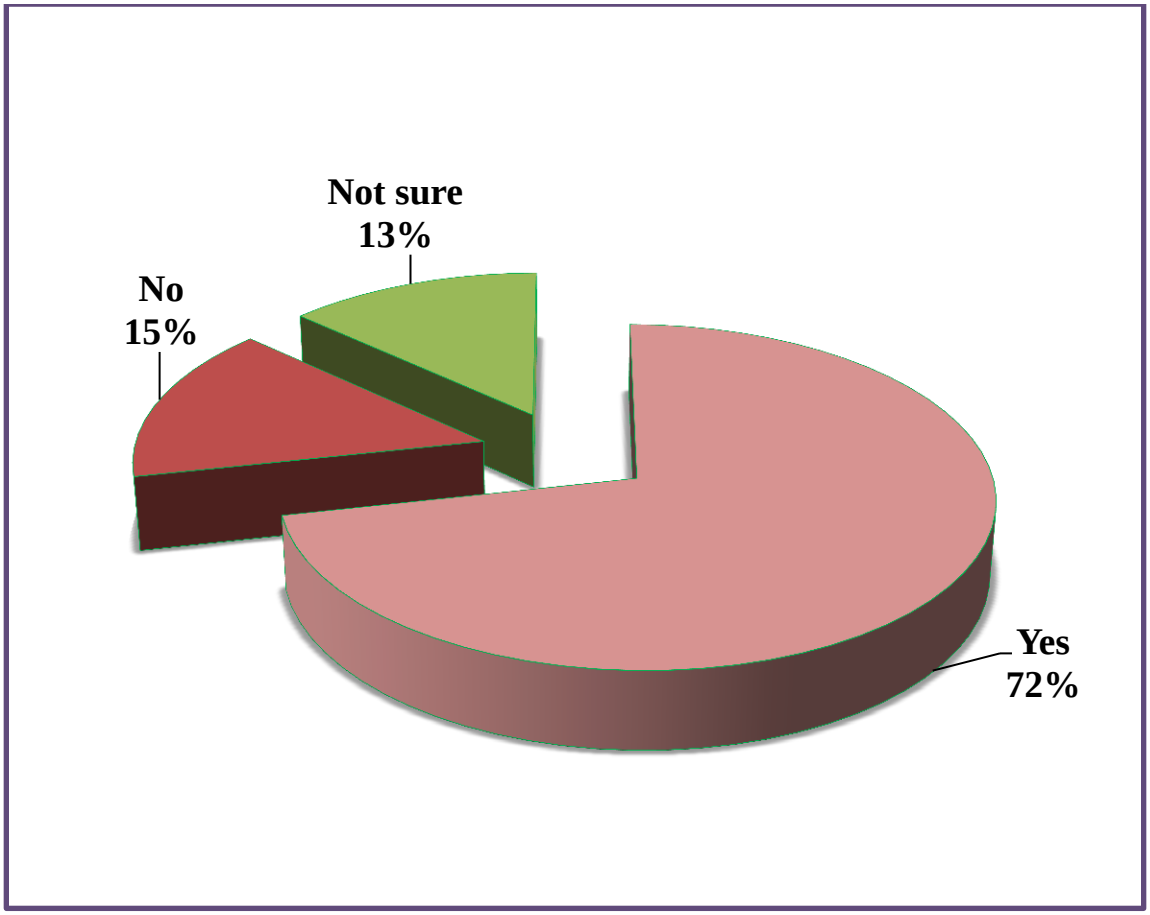

Figure 4.20 : Distribution of sample according to knowledge about margarine contains less fat than butter.

About sixty six percent of teacher known the hard fat that solid at rom temperature like the butter and quail contain saturated fat , eleven percent of teachers select the hard fat contain more unsaturated fat , twenty three percent stated not sure.

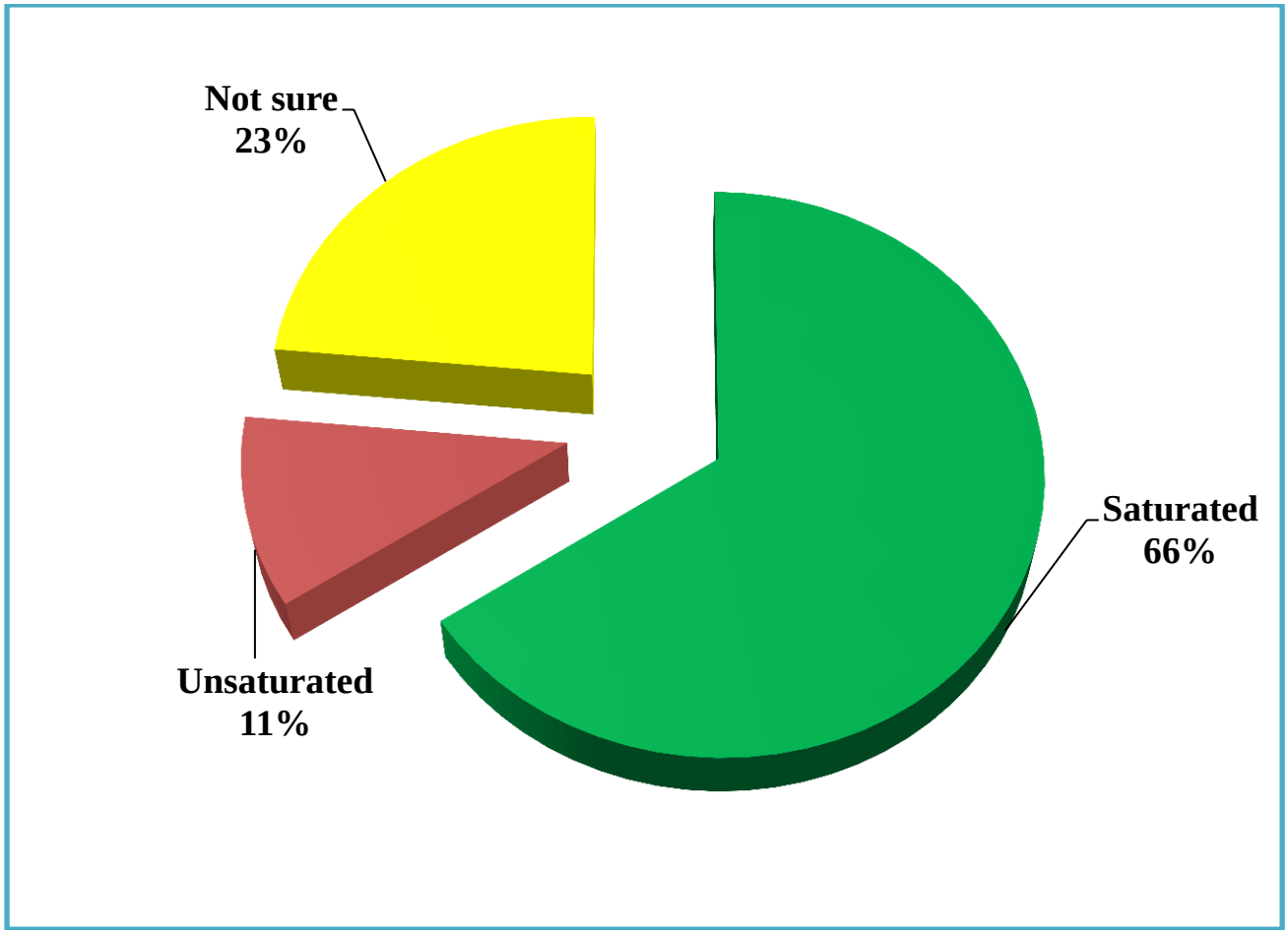

Figure 4.21 : Distribution of sample according to knowledge about harder fat contain more saturated or unsaturated fat .

The teachers asked on the type of food that contain more saturated fat about forty seven percent stated both vegetable oil and diary product contain more saturated fat, twenty five percent stated diary product contain more saturated fat, fifteen point eight percent stated vegetable oil, twelve point two percent not sure .most of teachers select both the vegetable fat and diary product contain saturated fat but other studies demonstrate the saturated fat in animal source only .

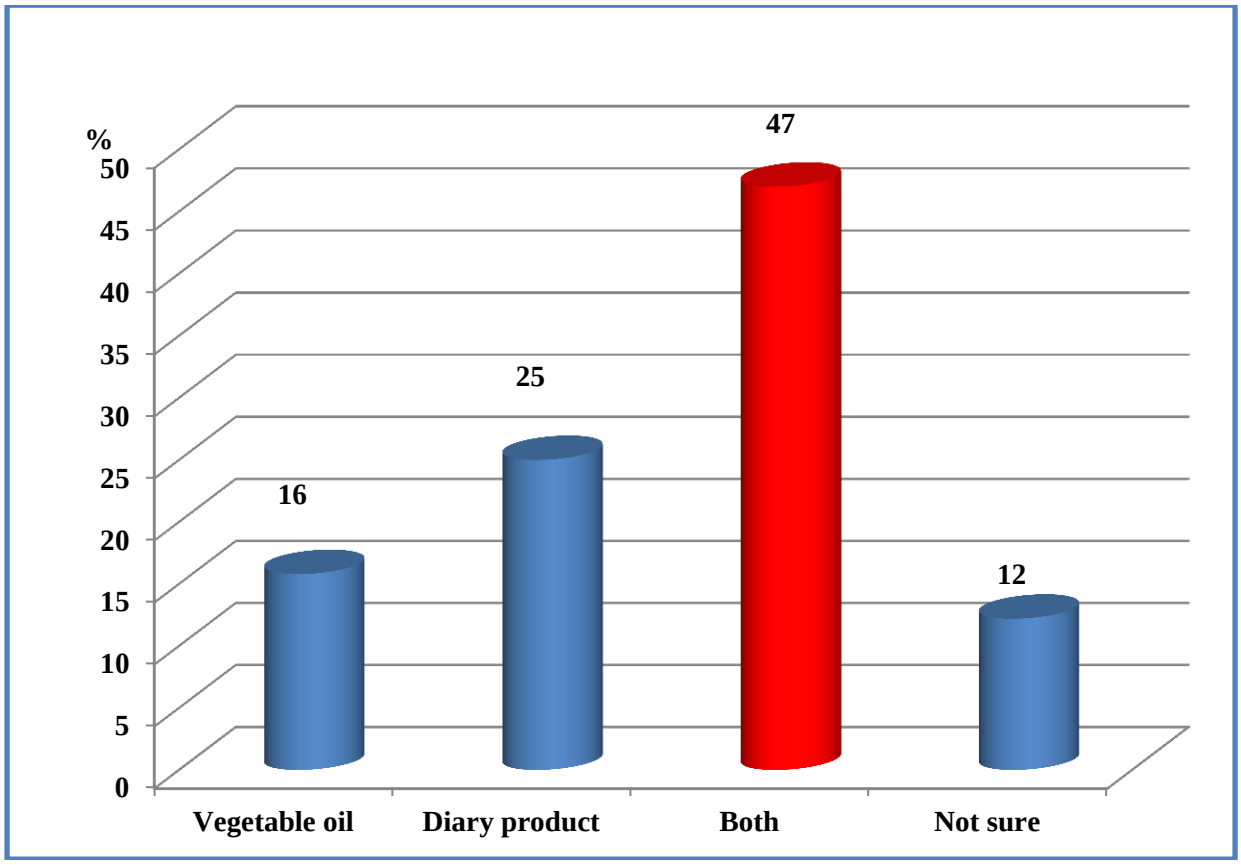

Figure 4. 22 : Distribution of sample according to knowledge about food contains more saturated fat .

About eighteen percent of sample stated that the fish lower fat option than other type of meat, fifteen percent chicken low fat option ,about two percent beef low fat , two percent selected lamb low fat. From this study most of teachers known the good source for healthy meat because contain good type of fat and omega -3

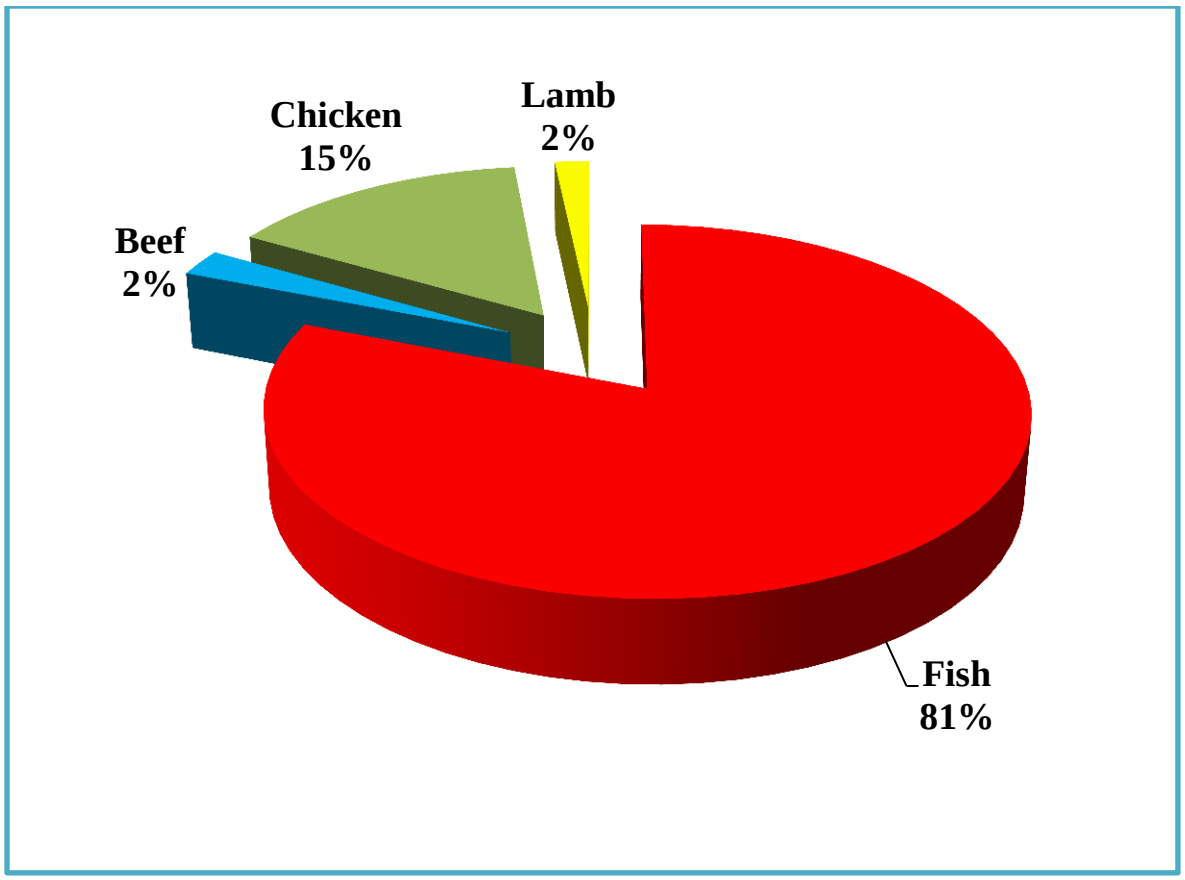

Figure 4.23 : Distribution of sample according to knowledge about the best choice as a lower fat option.

About seventy nine point five percent of participant stated animal fat raise blood cholesterol , four point nine percent stated sweet , one point nine percent vitamin, about thirteen point seven percent not sure, the teachers have good information on food that increase the blood cholesterol

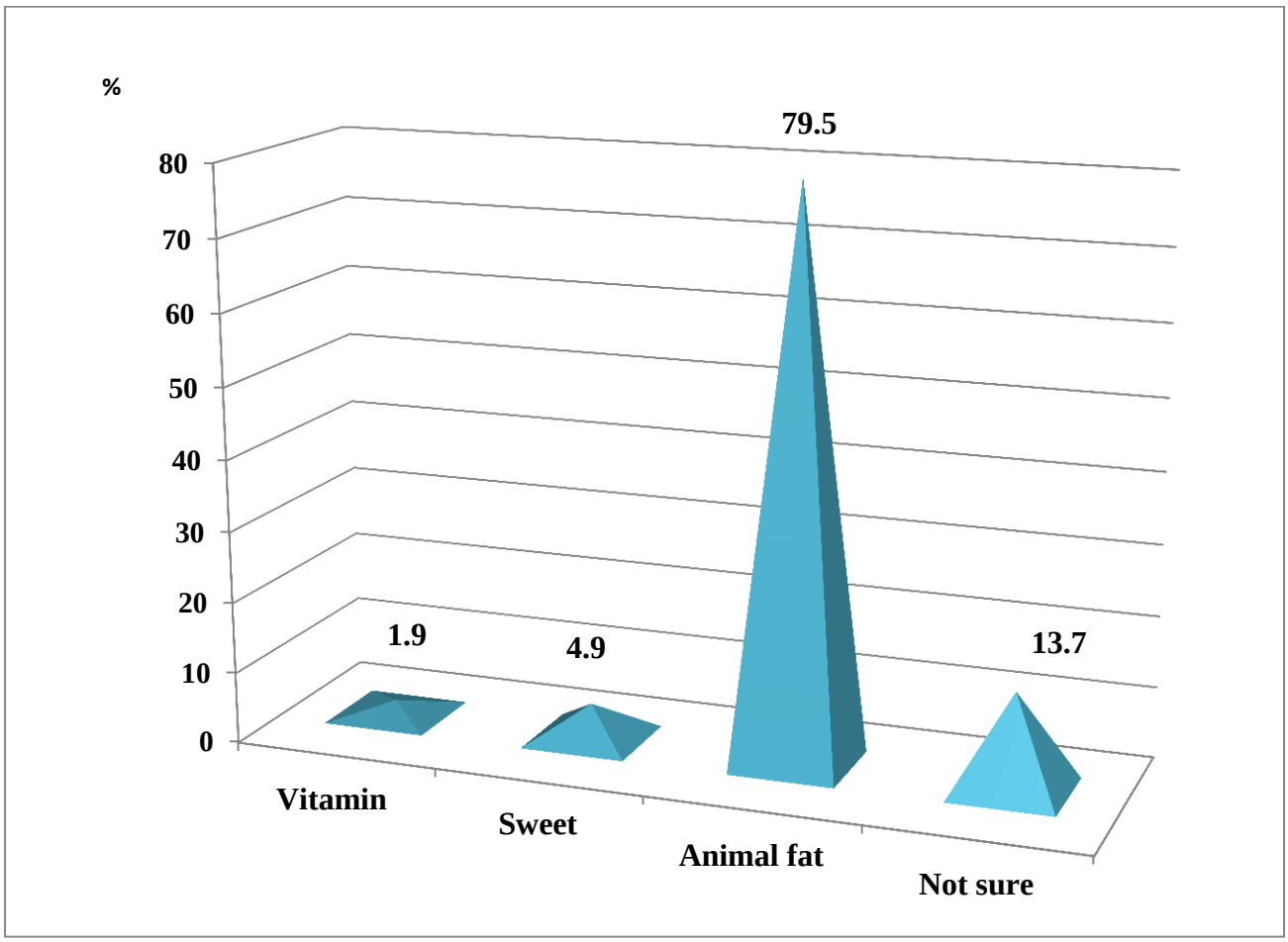

Figure 4. 24 : Distribution of sample according to knowledge about which food type is more likely to raise peoples blood cholesterol level .

About eighty two point seven of participant stated the fruit is best choice, about seven point three percent fried eggs, five point one percent fried vegetables, canned food four point nine from this can conclude the teaches have good knowledge about best food contain low salt option .

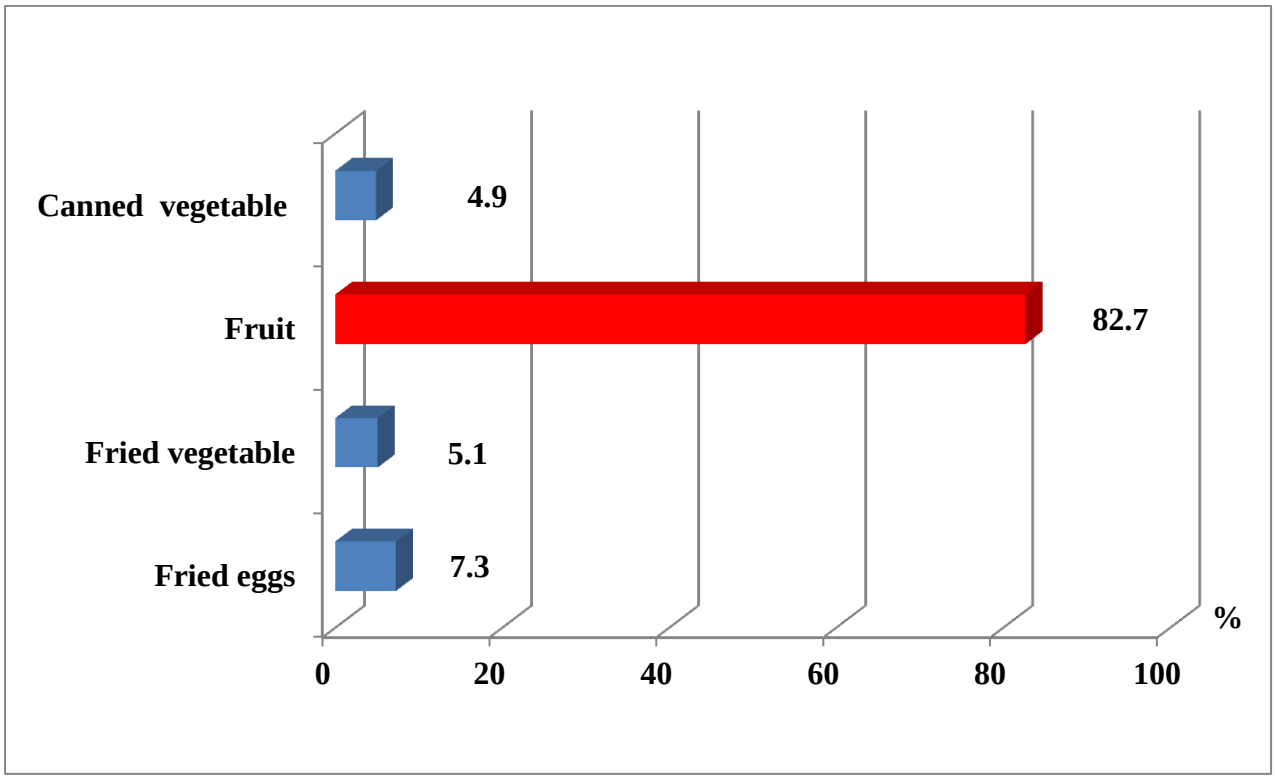

Figure 4.25 : Distribution of sample according to" if a person wanted to reduce the amount of salt in their diet, which would be the best choice .

About thirty nine point three percent of teachers select no more protein in whole than skimmed milk , about thirty two point three percent stated "yes" twenty eight point four percent "stated not sure", the teachers not have knowledge about this items because the amount of protein dose not related to amount of fat in food .

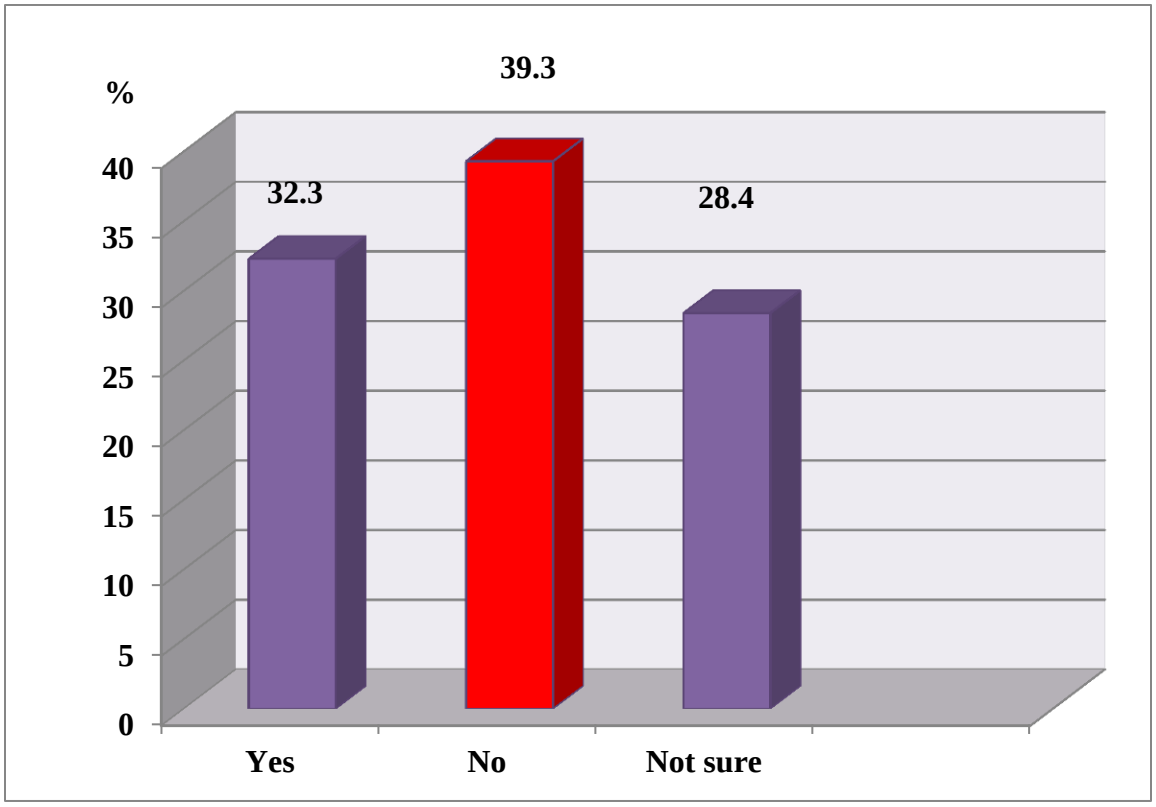

Figure 4. 26 : Distribution of sample according if more protein in a glass of whole milk than in a glass of skimmed milk .

Most of teachers select the digestive bisect as good source of low fat and high fiber than other types then select toast by 24% and bean 20.5% the teachers have good knowledge about good source of fiber

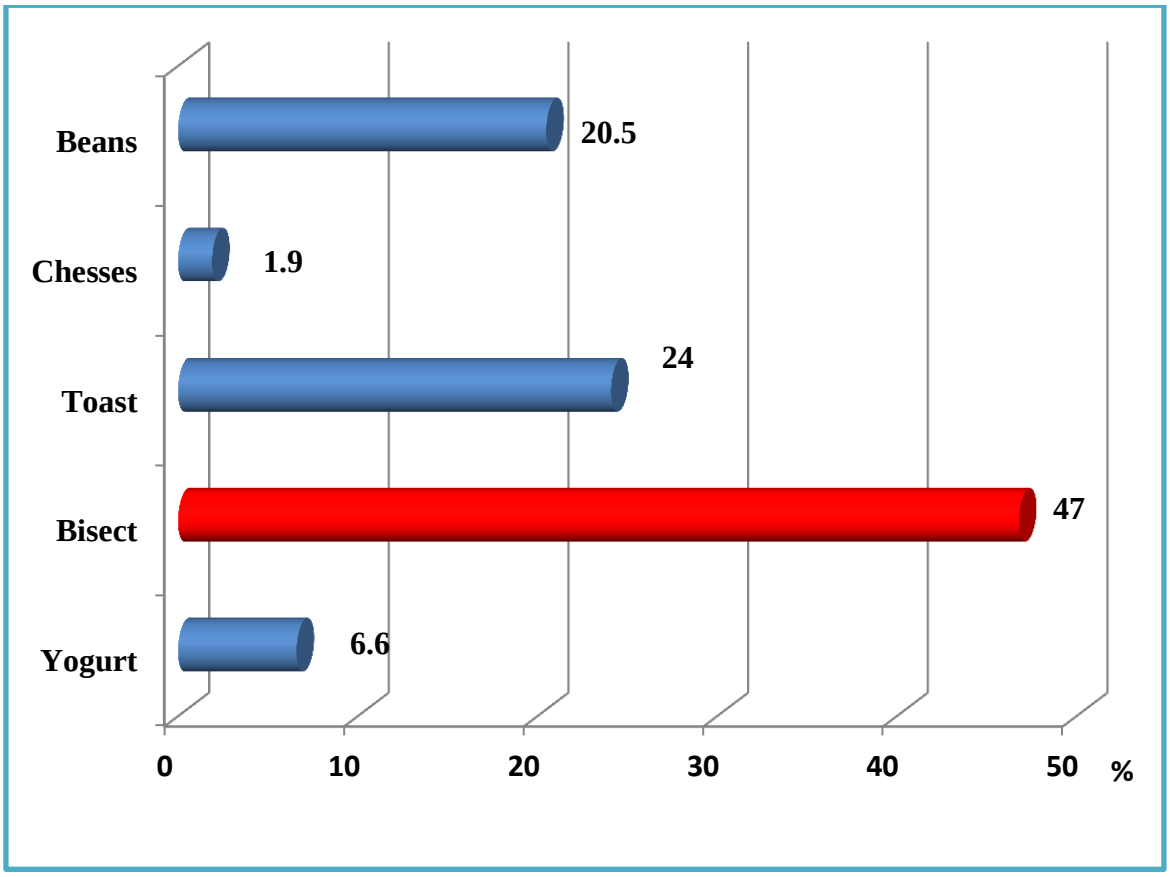

Figure 4.27 : Distribution of sample according to which would be the best choice for a low fat, high fiber snack.

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About 73% of teachers select yes difference in nutritional value between fruit and natural fruit juice ,19% no and 8% not sure . The teachers not have good information about nutritional value of food because there is difference in amount of fiber ,energy and nutrient content.

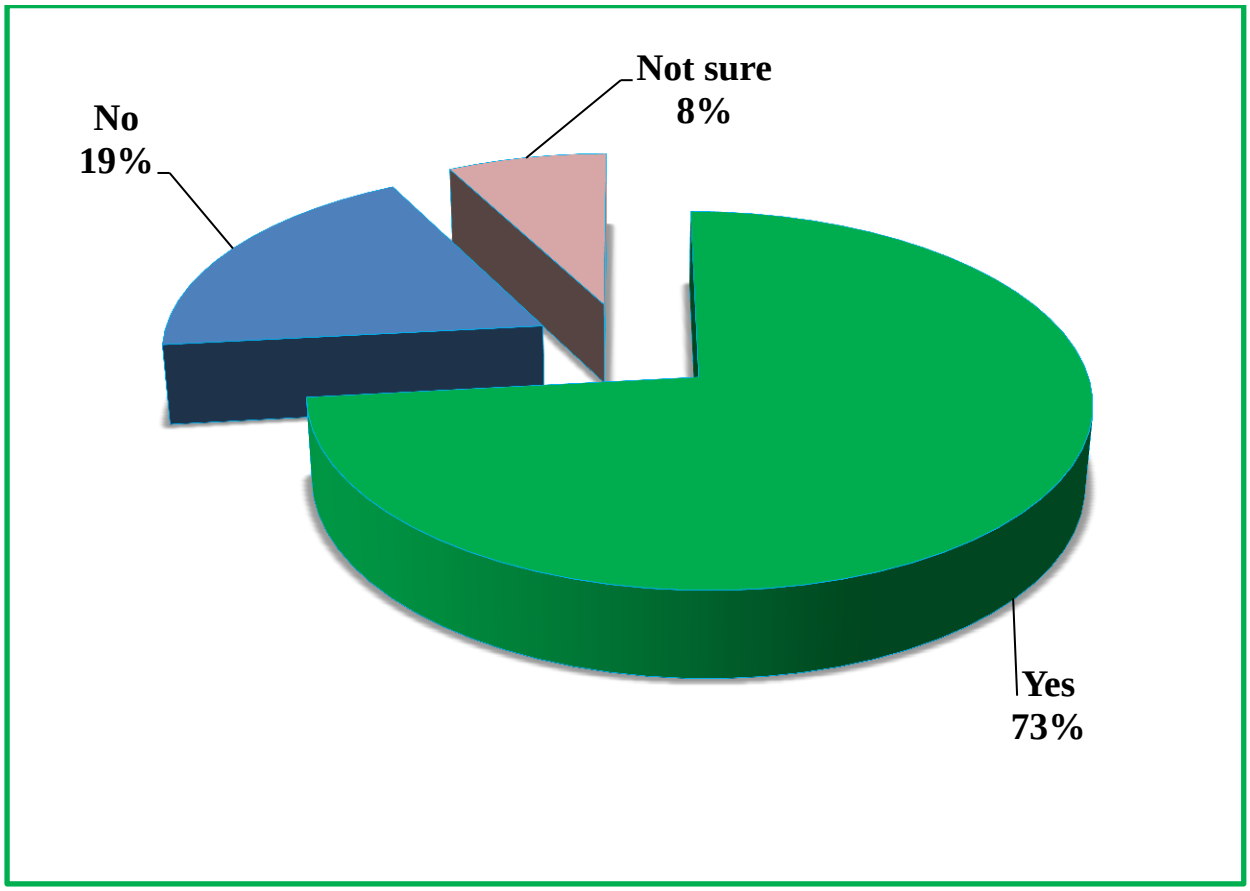

Figure 4.28 : Distribution of sample according to knowledge about nutritional value of fresh fruit juice as alternative to fruit .

Most of teachers 36% select the fat give more energy than others nutrints, then sect protein by 32% , 17% select carbohydrate give more energy ,about 3% select fiber and 12% not sure . the teachers have good knowledge on nutrient that give more enregy because fat give about 9kcal more than protrin and CHO give 4 kcal .

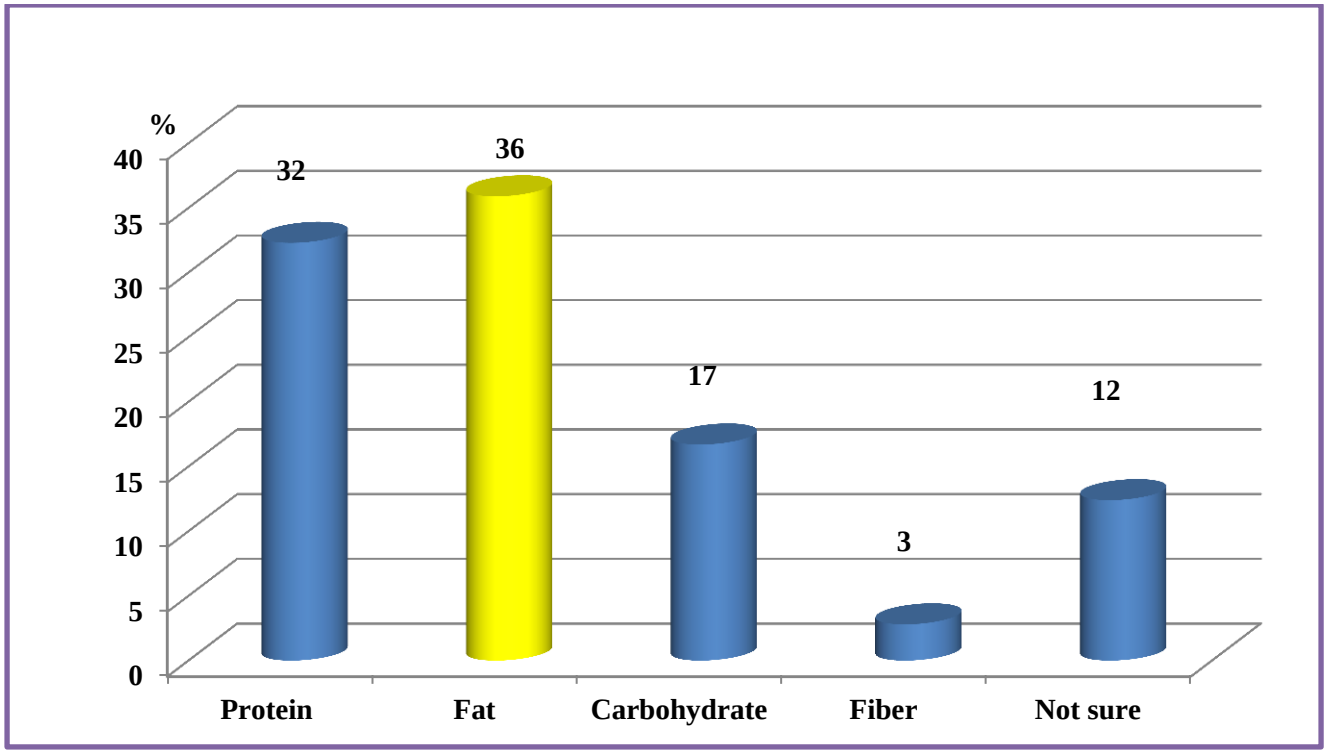

Figure 4.29 : Distribution of sample according to food component contained the most energy .

About 80 % of teachers select barley bread as more vitamin and minerals , 11% select whole grain bread as good bread ,and 9% select not sure

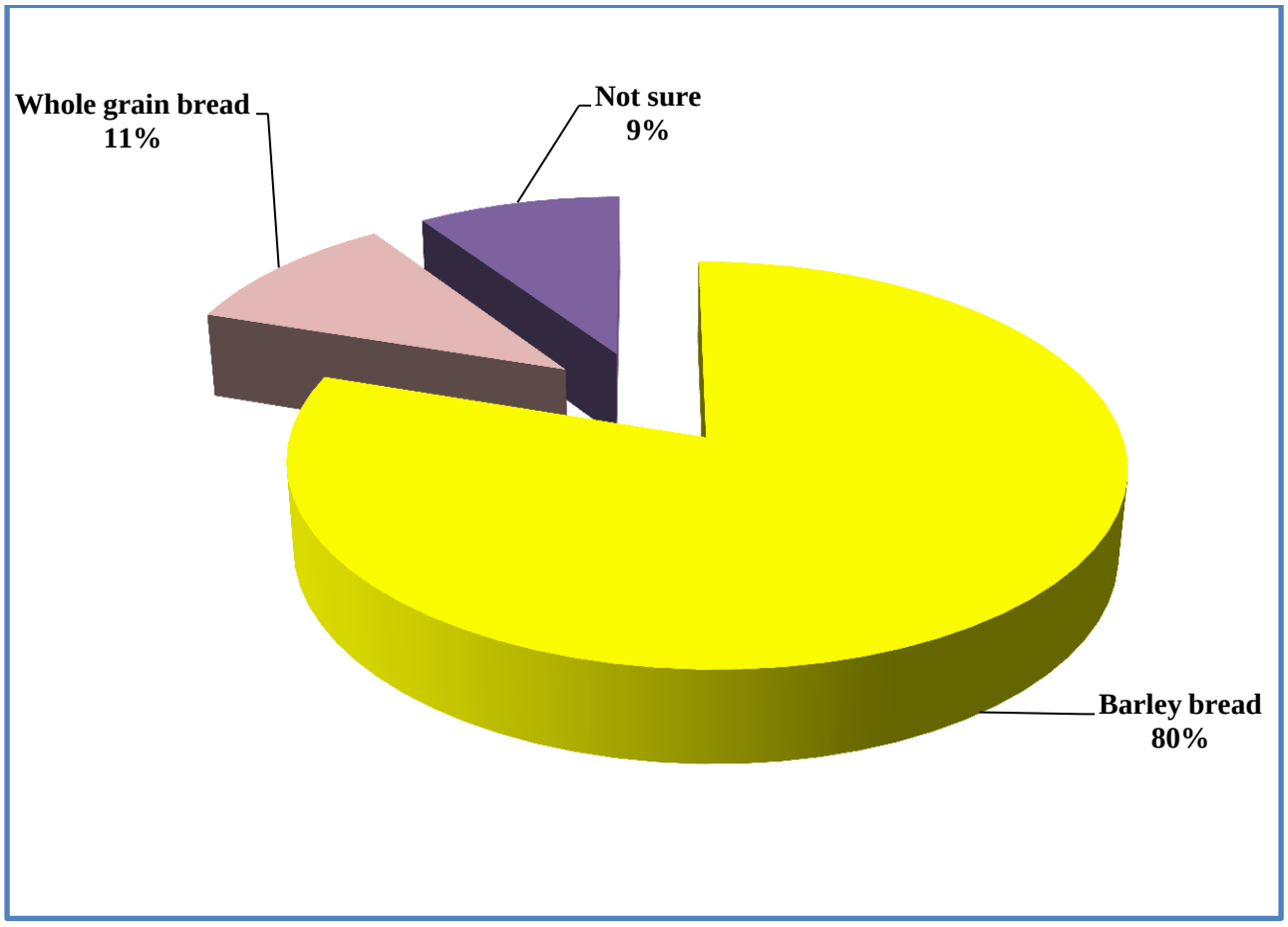

Figure 4.30 : Distribution of sample according to basic nutritional knowledge on content of vitamin and minerals in bread type .

Type about forty seven percent of respondent stated the amount of calcium in whole milk not different from skimmed milk, about twenty nine percent stated there is different in calcium, about twenty four percent stated not sure . According to calcium supplement guidelines, the calcium content of a food is unrelated to its fat content.

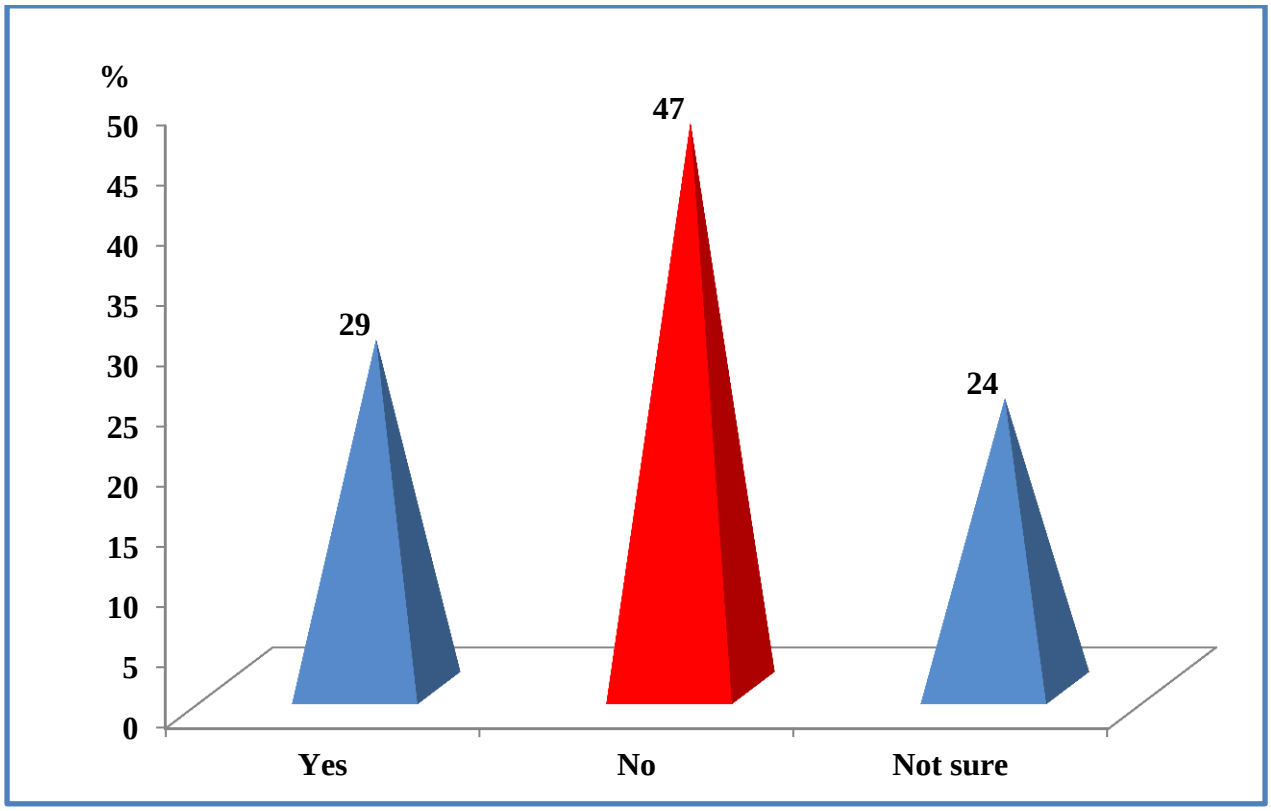

Figure 4. 31 : Distribution of sample according to knowledge about full milk contains less calcium than skim milk .

The participant have good information on source of calcium, when asked on amount of calcium in food most of teachers about ninety two percent stated milk rich source of calcium, three percent meat , five percent fruit

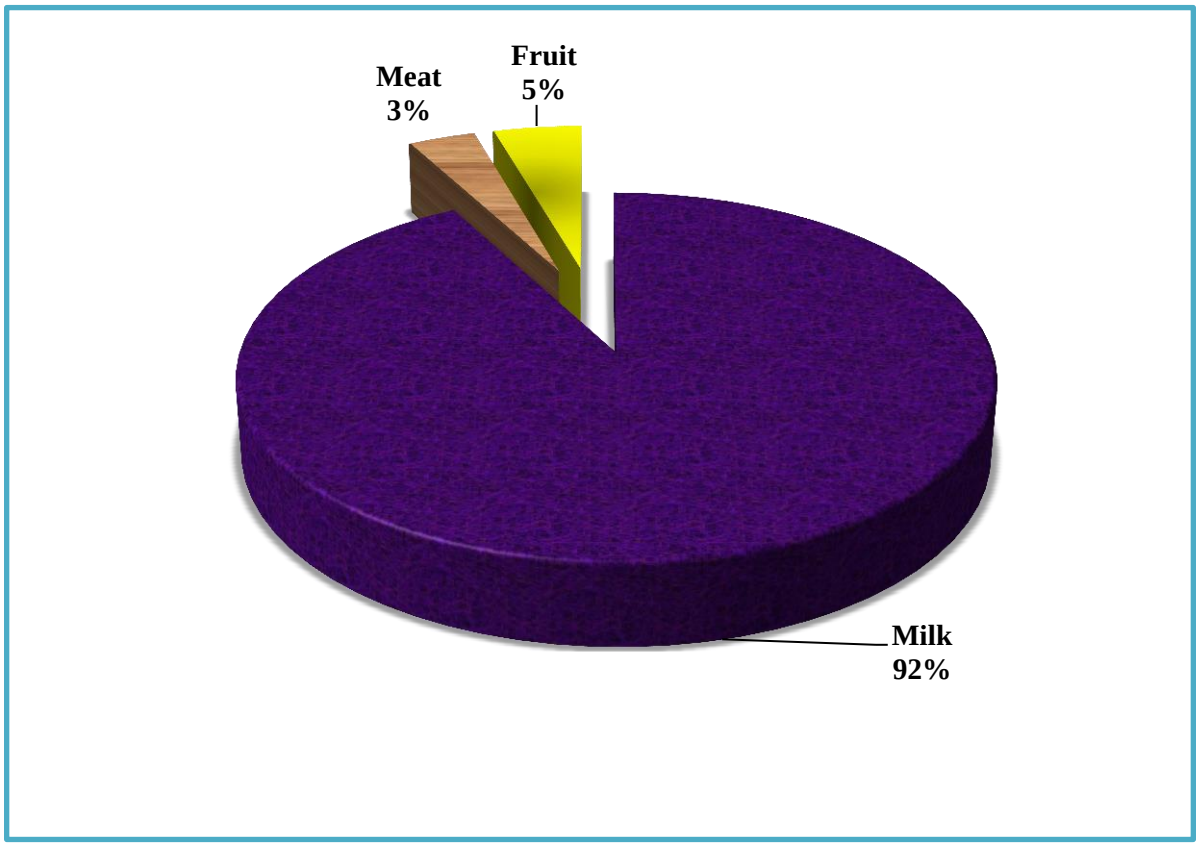

Figure 4.32 : Distribution of sample according to food type contain more calcium

About forty five point five percent of the subject not have idea on antioxidant vitamins and twenty point one percent have idea, About thirty four point four percent not sure. from this result the most of teacher not have idea about function of antioxidant vitamin that protect from many disease ,so required education about this topic .

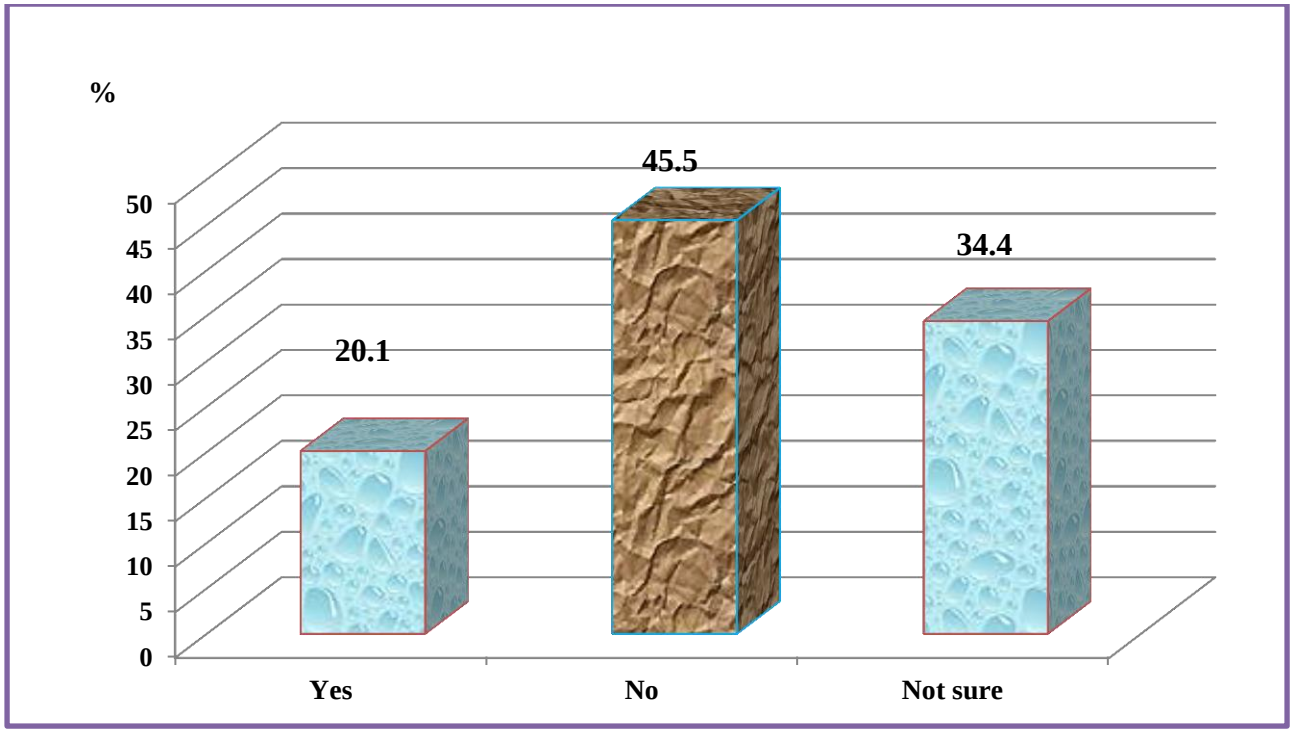

Figure 4.33: Distribution of sample according to knowledge about antioxidant vitamin

About sixty six point five percent select digestive biscuit as best choice , About twenty nine point nine percent honey with toast, about three point six percent selected chocolate , the teachers have good knowledge in food contain sugar because only 3.6% select the chocolate .

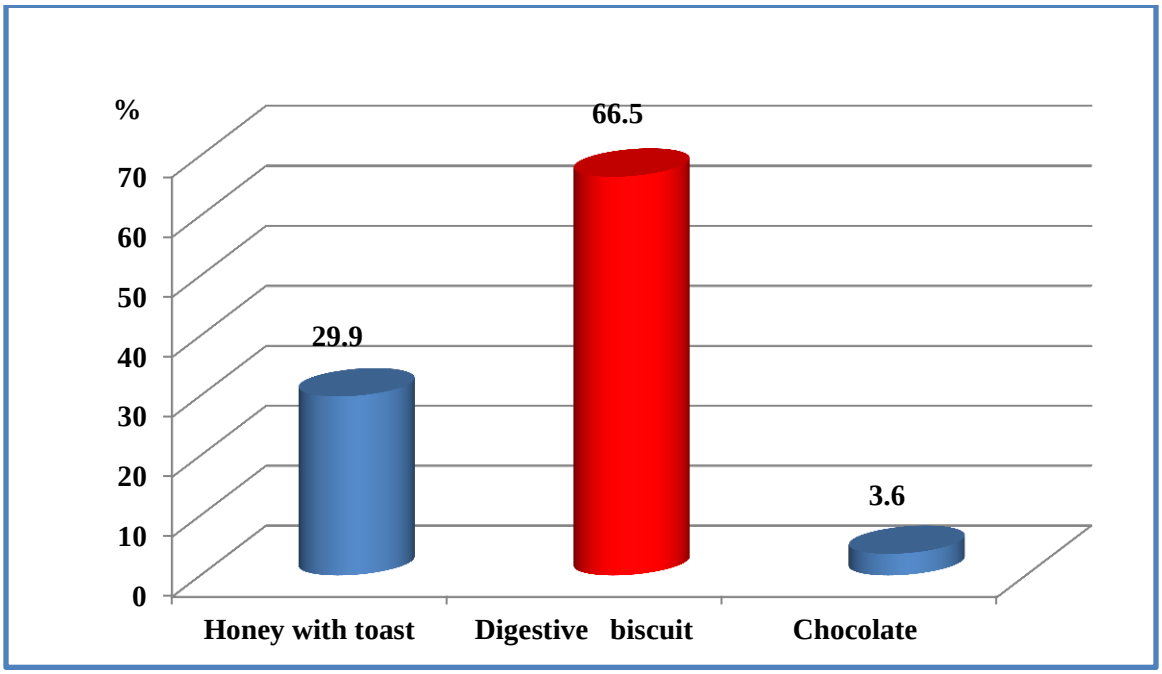

Figure 4.34 : Distribution of sample according to best choice when was trying to cut down on sugar .

(4.5) Attitude

The participants asked on which higher nutritional value, olive oil or butter, about seventy two percent select olive oil, nineteen percent select butter, four percent select same, and five percent select not sure, the teachers have good information on nutritive value of olive oil

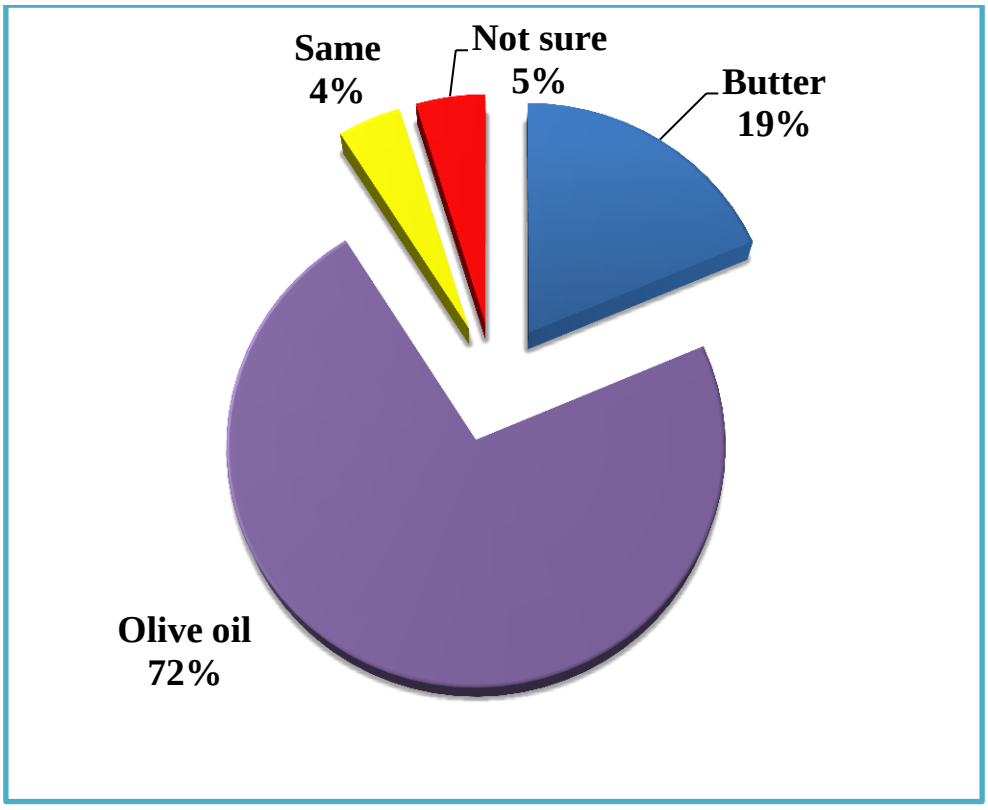

Figure 4. 35 : Distribution of sample according to which do you think high nutritional value.

Table 4. 1 : Distribution of sample according to do you think health experts recommend that people should be eating more, equal amount, or less of these foods .

About 87% of teachers select eating more amount from vegetables than other food ,then fruit by 83%, high fiber food by 62% and have good knowledge on food eating in less amount 83% select fatty food ,and food eating in equal amount the most of teachers select starchy food by 34%.

Food	Eating more amount		Eating equal amount		Eating less amount		Not sure		Total	
	No	%	No	%	No	%	No	%	No	%
Vegetable	408	87	40	8	17	4	3	1	468	100
Sugary food	24	5	81	17.3	355	76	8	1.7	468	100
Meat	23	5	190	41	234	50	21	4	468	100
Starchy food	20	4.3	160	34.2	272	58.1	16	3.4	468	100
Fatty food	13	3	56	12	389	83	10	2	468	100
High fiber food	292	62	101	22	46	10	29	6	468	100
Fruit	388	83	55	12	21	4	4	1	468	100
Salty food	25	5	93	20	343	73	7	2	468	100

Table 4. 2 : Distribution of sample according to do you think these food are high in fat

Most of teachers by 78.4% select meat as food contain high fat and cheese by 77% ,then nut 73% , egg 21.5% high fat ,and about 66% select bean ,55.5% of teachers select honey, bread low fat option .

Food	High		Low		Not sure		Total	
	No	%	No	%	No	%	No	(%)
Bean	89	19	309	66	70	15	468	100
Pasta	154	33	226	48.3	88	19	468	100
Meat	367	78.4	57	12.2	44	9.4	468	100
Honey	101	21.5	260	55.5	107	23	468	100
Egg	245	52	143	31	80	17	468	100
Nut	341	73	88	19	39	8.5	468	100
Bread	147	31.4	257	55	64	13.6	468	100
Cheese	360	77	65	14	43	9.2	468	100
Margarine	290	62	126	27	52	11	468	100

Table 4. 3: Distribution of sample according to do you think these fatty foods are high in saturated fat.

About 85 % of teachers select chocolate as high in saturated fat, then 81% select milk and red meat as high in fat .only 32%of teachers select the olive oil as high fat .

Food	High		Low		Not sure		Total	
	No	%	No	%	No	%	No	%
Full cream milk	379	81	64	14	25	5	468	100
Olive oil	148	32	286	61	34	7	468	100
Red meat	379	81	51	11	38	8	468	100
Margarine	277	59	136	29	55	12	468	100
Chocolate	396	85	42	9	30	6	468	100

Table 4. 4 : Distribution of sample according to do you think these are high in sugar.

About 81% of teachers select ice cream as high in sugar , 59% of participants select banana as high in sugar, only 10% select yoghurt as high in sugar about 25.4% select natural juice as high in sugar.

Food	High		Low		Not sure		Total	
	No	%	No	%	No	%	No	%
Banana	276	59	126	27	66	14.3	468	100
Yoghurt	48	10.2	385	82.3	35	7.5	468	100
Ice cream	379	81	42	9	47	10	468	100
Ketchup	229	49	108	23	131	28	468	100
Natural juice	119	25.4	310	66.3	39	8.3	468	100

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Table 4 . 5 : Distribution of sample according do you think these items are starchy food group.

Most of teachers select pasta and rice as good source for starchy source , butter and cheese by 10% -15% and nut by 24% . the teachers have good information in starchy food .

Food	Yes		No		Not sure		Total	
	No .	%	No .	%	No.	%	No.	%
Cheese	47	10	379	81	42	9	468	100
Pasta	440	94	16	3.4	12	2.6	468	100
Butter	70	15	352	75	46	10	468	100
Rice	421	90	33	7	14	3	468	100
Nut	113	24.2	264	56.4	91	19.4	468	100

Table 4 .6 : Distribution of sample according to do you think these are high in salt .

About 90 % of teachers select cheese as high in salt then sausage by 71.8% , 43.6 % of teachers select fish as high salt, 28% select pasta , meat by 30% of teachers.

Food	Yes		No		Not sure		Total	
	No	%	No	%	No	%	No	%
Pasta	131	28	234	50	103	22	468	100
Meat	140	30	225	48	103	22	468	100
Vegetable	187	40	154.4	33	127	27	468	100
Cheese	420	90	21	4	27	6	468	100
Sausage	337	71.8	47	10	84	18	468	100
Fish	204	43.6	203	43.4	61	13	468	100

Table 4. 7 : Distribution of sample according to do you think these foods are high in protein .

Most of teacher by about 84% select bean as good source for protein than animal source as chicken by 81%, then cheese 57.4% and fruit by 30.3%.

Food	Yes		No		Not sure		Total	
	No	%	No	%	No	%	No	%
Chicken	380	81	46	10	42	9	468	100
Cheese	269	57.4	126	27	73	15.6	468	100
Fruit	142	30.3	250	53.48	76	16.29	468	100
Bean	394	84.2	44	9.4	30	6.4	468	100

Table 4. 8 : Distribution of sample according do you think these food a healthy alternative to red meat .

The teachers select bean as alternative to red meat then liver by 55% , nut and cheese by about 40 % .

Alternative to red meat	Yes		No		Not sure		Total	
	No	%	No	%	No	%	No	%
Liver	258	55	120	26	90	19	468	100
Bean	372	79.5	51	10.9	45	9.6	468	100
Nut	189	40.4	179	38.2	100	21.4	468	100
Cheese	194	42	165	35	109	23	468	100

Table 4 . 9 : Distribution of sample according do you think these foods are high in fiber .

Most of teachers select corn and banana as good source for fiber high food, then meat ,fish and chicken egg contain low fiber than others .

Food	Yes		No		Not sure		Total	
	Number	%	Number	%	Number	%	Number	%
Corn	291	62	85	18	92	20	468	100
Banana	234	50	149	32	85	18	468	100
Egg	65	14	281	60	122	26	468	100
Meat	137	29	221	46	110	25	468	100
Fish	135	28.5	215	46.5	118	26	468	100
Chicken	129	27.5	218	46.5	121	26	468	100

Table 4. 10: Distribution of sample according do you think these item reduce the chances of getting certain kinds of cancer.

Most of teachers select eating more vegetables and less additive to reduce the chances of getting certain kinds of cancer by about 70% .then eating more fiber by 62% and only 33% less fruit .

Food	Yes		No		Not sure		Total	
	Number	%	Number	%	Number	%	Number	%
Eating more fiber	289	62	59	13	120	25	468	100
Eating fruit less	156	33.3	212	45.3	100	21.4	468	100
Eating more vegetable	328	70	60	13	80	17	468	100
Eating additive less	328	70.1	63	13.5	77	16.4	468	100

Table 4 . 11 : Distribution of sample according do you think these item prevent heart disease .

Most of teachers select eating less additives prevent heart disease then more fruit and vegetable by 81% . Then eating less saturated fat by about 70% and eating less salt by about 71%.

Food	Yes		No		Not sure		Total	
	Number	%	Number	%	Number	%	Number	%
Eating more fiber	263	56.2	77	16.4	128	27.4	468	100
Eating less saturated fat	327	70	85	18	56	12	468	100
Eating less salt	334	71	65	14	69	15	468	100
Eating more fruit and vegetables	381	81	27	6	60	13	468	100
Eating less additives	317	86	68	14	84	18	468	100

(4.6) Nutritinal practice .

About 54% of teacher not on diet control and according to BMI the mejorty were pre obese and not have ideia about diet deases related so the paricipants requried education about nutrition .

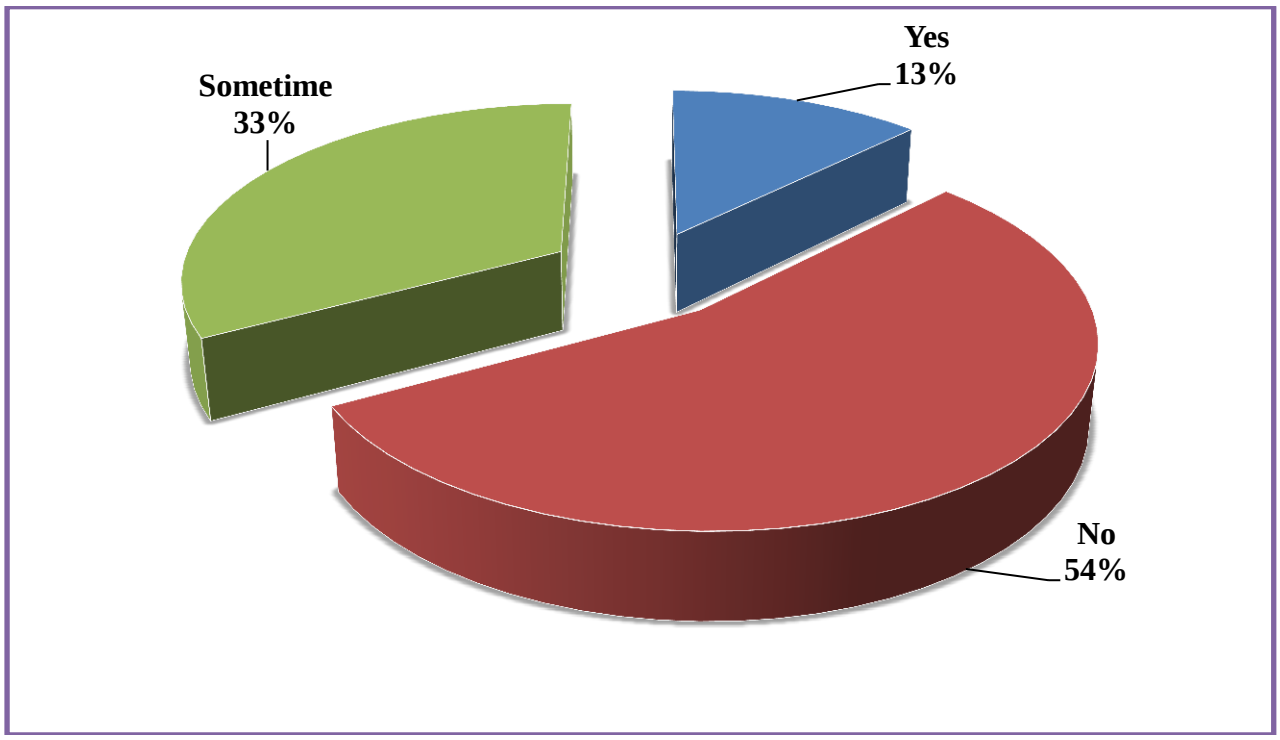

Figure 4. 36 : Distribution of sample according to respondent who is on diet control .

About 40% teacher select most take 4 serving from fruit and vegetable per day , so have knowledge about importance of fruit and vegetables in diet .

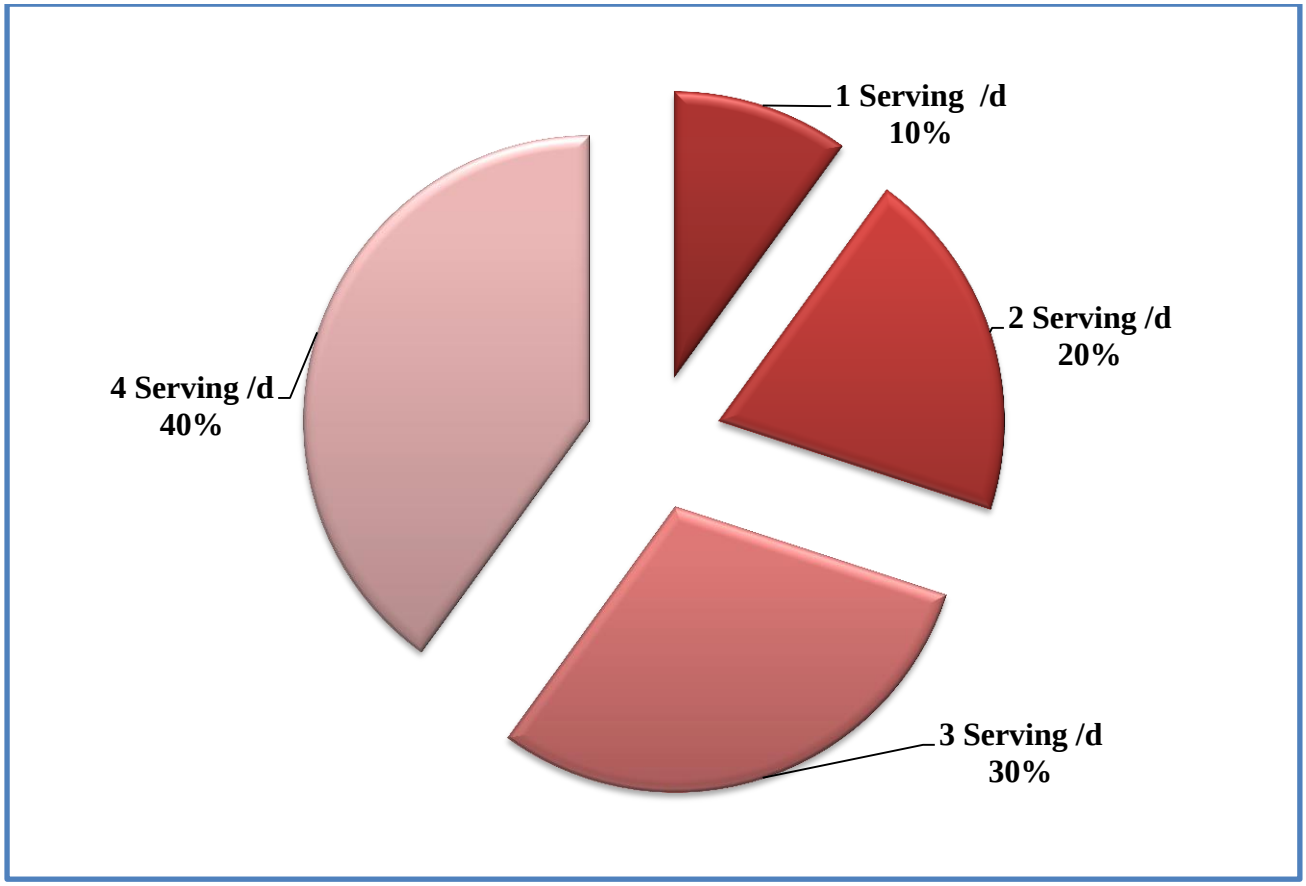

Figure 4. 37: Distribution of sample according to serving number of vegetable and fruit /day

Mean=1.5 Median=1 Std. d =0.738 Minimum =1 Maximum=4

Most of teacher about 60% drink 5-7 glasses of water per day, only 9% select one glass , 20% drink 2-4 glass , 11% drink 8 glass. The teachers have good practice about amount of water drink per day .

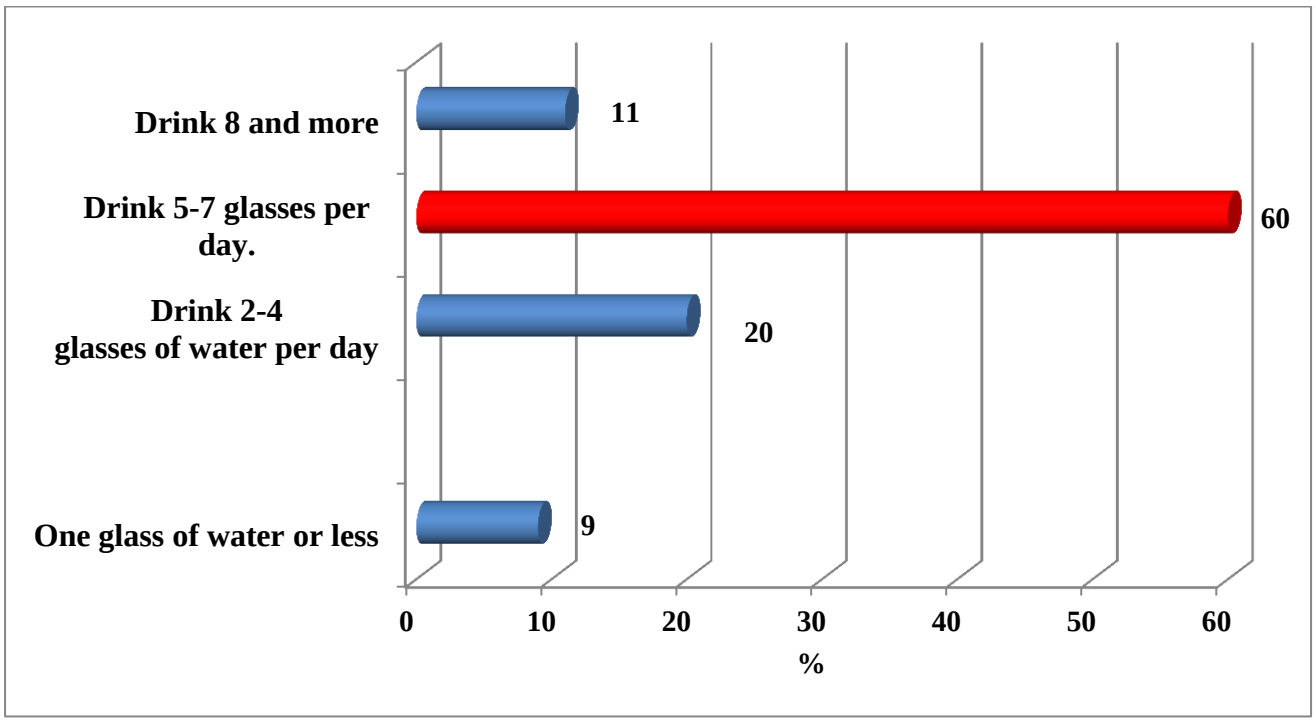

Figure 4. 38 : Number glass of water consumed by teacher per day .

About 40% of teachers skip breakfast during the day with only 10 % do not skip meals the teacher have bad practice and required education in importance of breakfast .

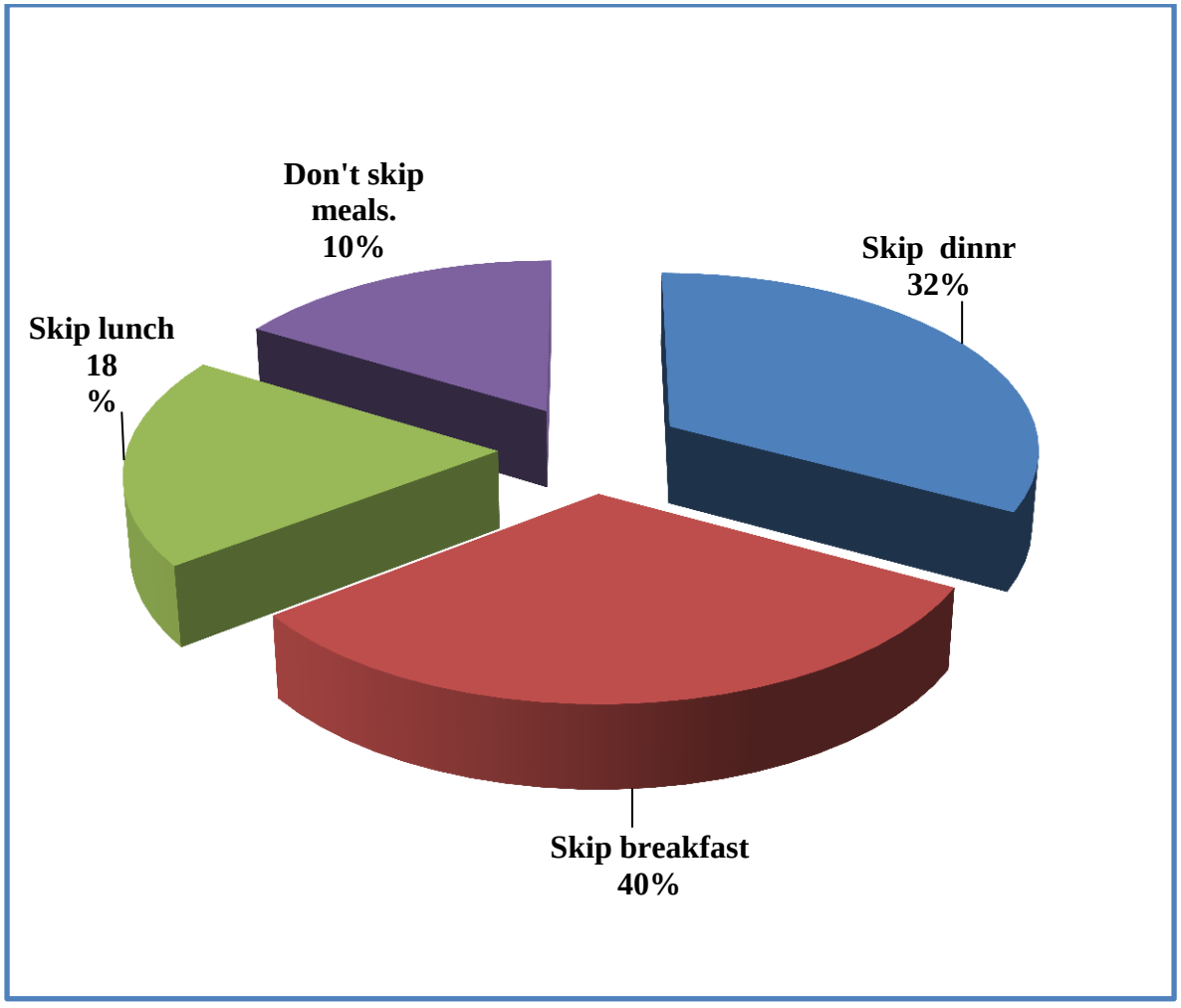

Figure 4.39: Distribution of sample according to meal skipping.

The tope food consumed per day by teachers it is starchy food about 16 % consumed bread other type of starchy food is rice by 7.8% , vegetable 12%, fruit 5.6% ,coffee consumed more than tea also consumed beef more than lamp and chicken ,egg by 7% , lentil more than bean , cheese and yoghurt by 6 %, milk by 3% .

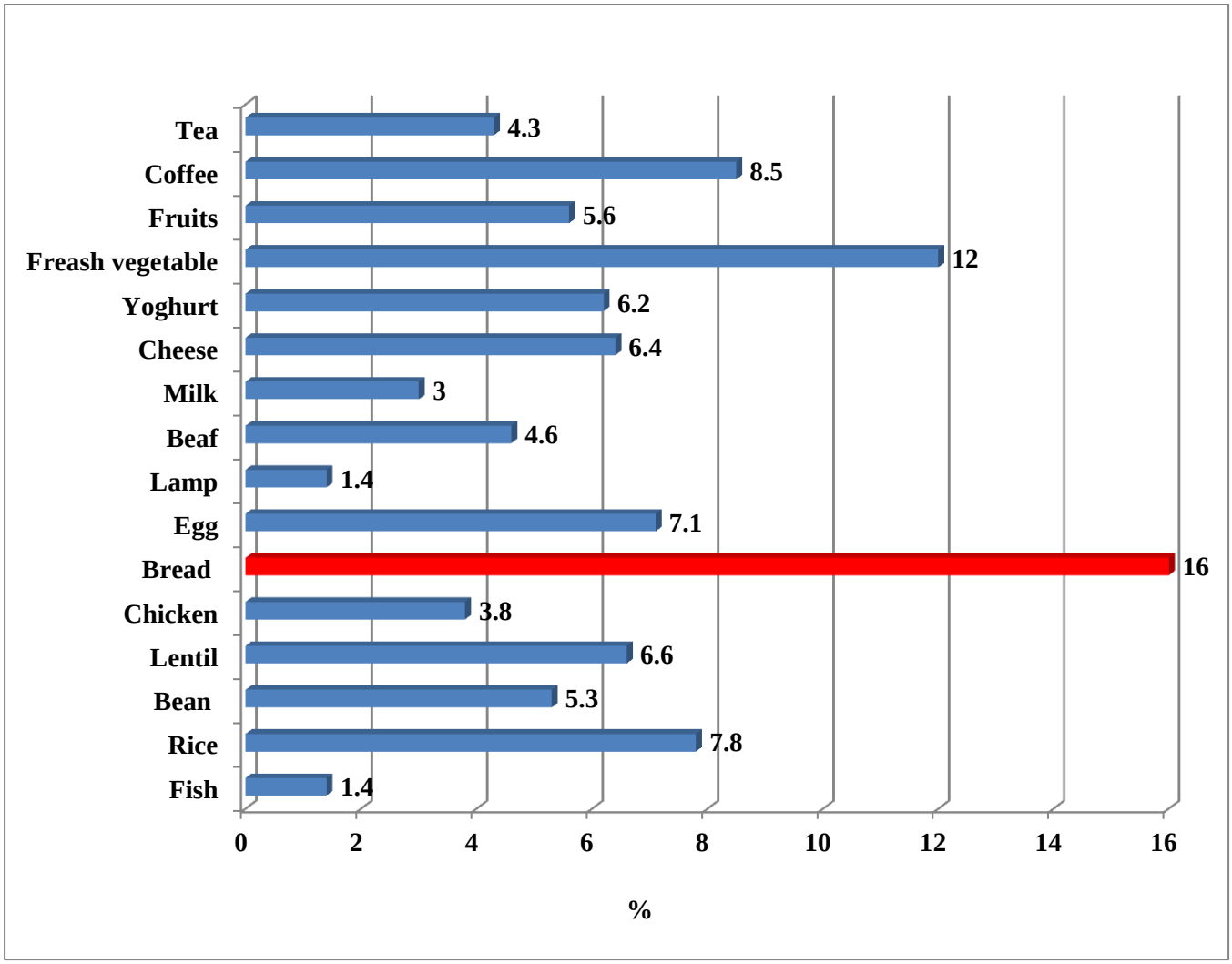

Figure 4. 40: Distribution of sample according to food type that consumed at high frequencies.

About 50% of teacher select required nutrition education , 30% no ,and 20 select not sure ,the teachers required to participate in nutrition education programs, lectures or other activity to increase their knowledge about food and health .

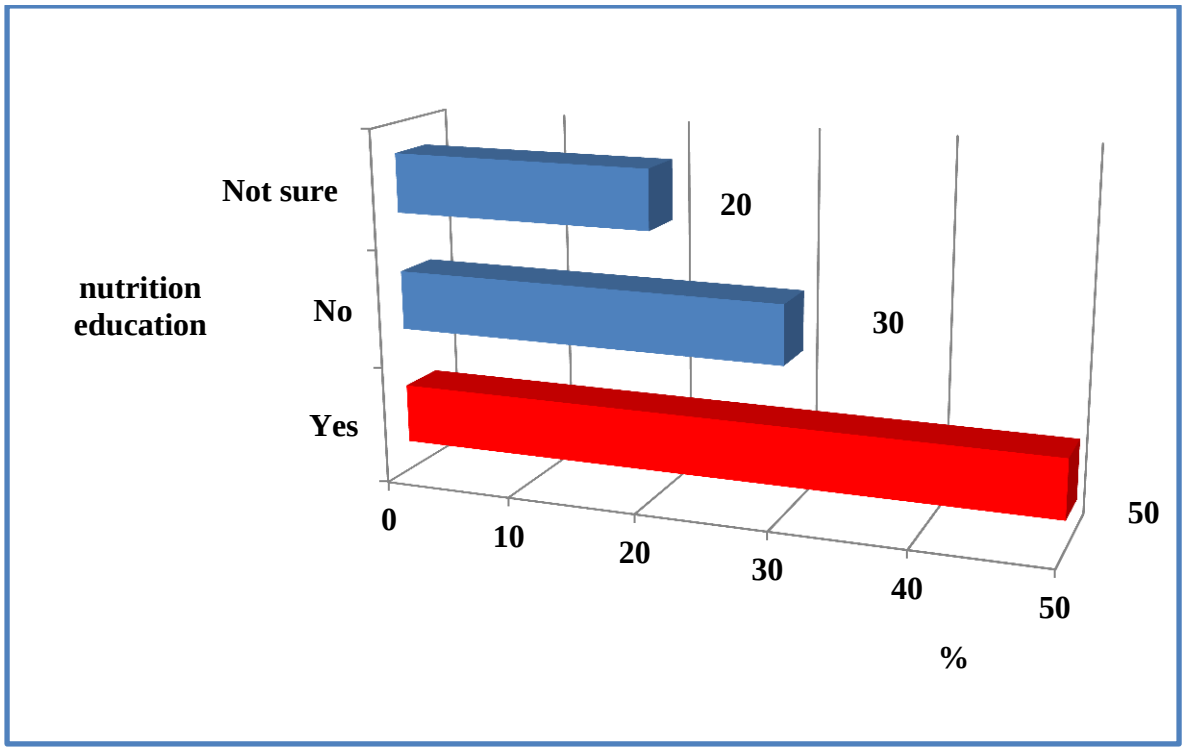

Figure 4. 41: percentage of response according if the teacher required nutrition education to achieve health eating .

Table 4. 12 : Distribution of sample according to relation between age and knowledge about disease related to nutrition .

According to p value 0.12 the relation between age and knowledge about disease related to nutrition not significant .

Age	knowledge about disease related to nutrition							
	Yes		No		Not sure		Total	
	Number	%	Number	%	Number	%	Number	%
≤ 20	1	50	0	0.0	1	50	2	100
21-30	25	26	17	17	56	57	98	100
31-40	73	40	29	16	79	44	181	100
41-50	73	46	19	11.9	67	42.1	159	100
51-60	10	35.7	6	21.4	12	42.9	28	100

X^2 = 12.7 df = 8 p value = 0.12

.

Table 4. 13 : Distribution of sample according to relation between education level and knowledge about disease related to nutrition .

According to p value 0.147 the relation between education and knowledge about disease related to nutrition not significant **.**

Education	knowledge about disease related to nutrition							
	Yes		No		Not sure		Total	
	Number	%	Number	%	Number	%	Number	%
Diploma	58	40	31	21	57	39	146	100
High diploma	47	39.8	13	11	58	49.2	118	100
University	74	38.9	25	13.2	91	47.9	190	100
Other	3	21.4	2	14.3	9	64.3	14	100

X^2= 9.5 df = 6 p value = 0.147

Table 4.14 : Distribution of sample according to realtion between diet control and knowledge about disease related to nutrition .

According to p value 0.00 the relation between diet control and knowledge about disease related to nutrition was significant .

Diet control	Knowledge about disease related to nutrition							
	Yes		No		Not sure		Total	
	Number	%	Number	%	Number	%	Number	%
Yes	35	59.3	8	13.6	16	27.1	59	100
No	86	33.9	55	21.7	113	44.4	254	100
Not sure	61	39.4	8	5.1	86	55.5	155	100

X^2= 33.1 df= 4 P value = 0.00

Table 4.15 : Distribution of sample according to realtion between age and Body mass index (BMI) .

According to p value 0.00 the relation between age and BMI was significant

Age	Body mass index (BMI)								
	Under wt*	Normal wt*	Over wt*	Pre Obese	Obese	Obese I	Obese II	Obese III	Total
	Number (%)	Number (%)	Number (%)	Number (%)	Number (%)	Number (%)	Number (%)	Number (%)	Number (%)
≤ 20	0(0)	2(100)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	2(100)
21-30	1(1)	43(44)	7(7.1)	25(25.5)	8(8.2)	12(12.2)	1(1)	1(1)	98(100)
31-40	1(0.6)	34(18.8)	12(6.6)	54(29.8)	7(3.9)	45(24.9)	17(9.4)	11(6)	181(100)
41-50	0(0)	25(15.7)	12(7.5)	46(28.9)	7(4.4)	42(26.4)	20(13)	7(4.1)	159(100)
51-60	0(0)	5(17.9)	1(3.6)	9(32.1)	0(0)	6(21.4)	6(21.4)	1(3.6)	28(100)

wt* = wieght **X^2= 60.5** **df= 28** **p value = 0.00**

.

Table 4. 16 : Distribution of sample according to relation between body mass index (BMI) and energy intake .

According to p value 0.84 the relation between BMI and energy intake was not significant .

BMI	Energy intake (kcal)							
	<500	501-800	801-1101	1102-1402	1403-1703	1704-2004	2005-2305	Total
	No.(%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Under weight	0 (0)	1(50)	1 (50)	0 (0)	0(0)	0 (0)	0 (0)	2 (100)
Normal weight	8(7.3)	38(34.9)	45(41.3)	11(10.1)	6(5.5)	1(0.9)	0 (0)	109(100)
Over weight	3(9.4)	8(25)	12(37.5)	7(21.9)	2(6.2)	0(0.0)	0 (0)	32(100)
Pre obese	14(10.4)	52(39)	47(35)	14(10.4)	6(4.5)	1(0.7)	0 (0)	134(100)
Obese	2(9)	9(40.6)	9(40.9)	1(4)	0(1)	1(4.5)	0 (0)	22(100)
Obese I	11(10.5)	39(37.1)	40(38.1)	10(9.5)	4(3.8)	1(1)	0 (0)	105(100)
Obese II	5(11.4)	20(45.5)	14(31.8)	4(9)	0(.0)	0(.0)	1(2.3)	44(100)
Obese III	1(5)	6(30)	8(40)	5(25)	0(.0)	0(0)	0 (0)	20(100)

X^2 = 32.7 df= 42 p value = 0.84

Chapter five

Discussion

5.1 Socio-demographic characteristic , anthropometric measurement and dietary information of female teacher .

5.1.1 Age and nationality

The study investigated a nutritional knowledge , attitude and practice of female teacher, about 468 completed questionnaires with response rate 93% , thirty nine percent point one of teachers were aged between thirty one and forty years old, about twenty one percent were aged between twenty one and thirty years old ,point four of participant aged between eighteen and twenty years old , about thirty three point three percent of teachers aged between forty one and fifty years old ,and about six point two percent of teachers aged between fifty one and sixty years old with mean age 38 ± 8 year . The relation was not significant between age and the nutritional knowledge of respondents at 0.05 level of significance (p=0.1).Study done on teacher in British found that teachers age correlated positively with the initial knowledge but with no statistical significance (p = 0.322). (Abogabal et al ., 2014) .The majority of teachers were Libyan (99.6%), non Libyan (0.4%).

5.1.2 Social status and education level

The findings from this study indicate that the majority of the teacher sixty one point five percent was married while two point one percent widows, thirty one point five percent single , and four point nine percent divorce, about eight point three percent of teachers do not have children , about thirty one point two percent have one to three child , about twenty six percent have four to six child, about two point eight percent have seven to nine child . In the present study education level was diploma thirty one point two percent and high diploma about twenty five point two percent and university forty point six percent and other three percent , the relation not significant between nutrition knowledge and the education level of respondents at 0.05 level of significance (p=0.14) .

The finding was in contrast with studies in USA and India, which showed a positive correlation between the level of education and the nutrition knowledge of the respondents (Grover et al, 2004.) Higher education levels lead to increased nutrition knowledge levels as the nutrition messaging is more comprehensive as compared to lower education levels. (Nekasa , 2012).Numerous studies have consistently concluded that women education is a critical resource for maternal and child health, nutrition and survival ,educated mothers tend to be better able to use healthcare facilities, interact freely with healthcare providers, comply with treatment recommendations, and keep their living environment clean.(Komakech , 2012) .

5.1.3 Anthropometric measurements

5.1.3.1 weight and height

The sample distributed according to weight (kg) with mean body weight 76 ±17kg mean height 161 ± 5cm., in present study, unhealthy eating practices was identified by most teachers , were fifty four percent of teacher " not" on diet control, thirteen percent stated "yes" on diet control, about thirty three percent not sure. Study on Sudanese student show fifty six percent stated that they are not following any special diet while twenty eight percent on a weight loss diet. About ten point three percent students claimed to be vegetarians. Four point nine percent were on fat restricted diet (Elhassan et al ., 2013). Other study reported that females as young as twelve years of age had tried to lose weight, including forty four percent who dieted using food restriction and about seventy eight percent who exercised to lose weight. A greater prevalence of dieting among overweight sixty seven percent prevalence versus at risk for overweight twenty five percent high school females (Abraham and ODea ,2000) There is relation between diet control and knowledge p value (0.00) .

5.1.3.2 Body mass index (BMI)

The nutritional status of teachers were categorized into poor and good nutritional status using BMI .It was found that out of the 468 teacher about point four percent were underweight with

A mean BMI of about sixteen point one , whereas twenty three point three percent normal weight, about seven percent of the teacher was overweight about twenty eight point six percent pre obese ,while four point seven was obese. According to BMI findings, majority of women were pre obese. Contrasted with other study , (Amamoto et al ,.2004; Azizi et al,.2011) Study to determine the relationship between dietary life and indefinite complaint in female nutrition department students, showed that the overweight among Japanese students was about five point eight percent and obesity was zero , also study on Chinese students, overweight spread was two point five percent and obesity spread was about point four percent .

But in USA spread of obesity or overweight where body mass index (BMI) equal twenty five was thirty five percent. (Sakamaki, et al 2005 ; Azizi et al,. 2011) . Study to determine the nutritional status and risk factors for vulnerability of older people in Africa which stated that about ten percent of non-pregnant women in Uganda have a BMI below 18.5kg/m^2. The results were also comparable to those observed in sub-Saharan Africa where the prevalence of under-nutrition (BMI < 18.5) in adult populations of the countries sampled ranged between seven point six percent in Tanzania to forty four point six in Ghana for women of reproductive age (Helpage, 2004; Komakech ,2010). There is significant relation between body mass index (BMI) and age (p value 0.00) , and not significant relation between body mass index (BMI) with education level , (BMI) with knowledg**e** (p value = 0.51), (p value = 0.26) respectively .

5.1.4 Energy and macronutrients intake

Mean energy intake of teacher 848 ± 287kcal , mean energy requirement per day about 1648 ± 222kcal, mean carbohydrate intake 150 ± 52.8g, mean carbohydrate requirement 245 ±34.9g, mean fat intake 25g ± 19.5 g , mean fat requirement 45g ± 6.5g mean protein intake 34 ± 30g protein requirement 8.9 ± 61g. no association between energy intake and the BMI of respondents at 0.05 level of significance (p=0.8) .

The dietary assessment from twenty four hour food record showed that the energy and almost all nutrient intakes of the women in the study area were below the recommended nutrient intakes .This finding was constricted with the finding of (Komakech , 2010). This study aim to known the factors influencing the nutritional status of women of reproductive age. The results of the study are presented a poor diet among participants, resulted in insufficient intake of several nutrients. The energy intake was inadequate, on average only sixty percent of reference value was taken . Protein and fat intake was also low as only seventy six percent of the reference value was taken. the relation not significant between body mass index (BMI) and energy intake, p vale mor than 0.05 (P value = 0.84).

5.2 Nutritional knowledge , attitude and practice of participants :

5.2.1 Nutritional knowledge

5.2.1.1 Nutritional knowledge about diet disease related :

The sample distributed according to the respondents have knowledge on nutrition disease related, about thirty nine percent have knowledge on nutrition disease related , about fifteen percent not have knowledge and forty six percent not sure , this finding was in contrast with other study about nutrition knowledge among a sample of urban black and white South Africans show low in nutrition knowledge in a sample of nineteen urban black And nineteen urban white south Africans (eighteen years and older) in Limpopo province through a telephone survey. This study aimed at particularly determining the level of nutritional knowledge in this urban population. The survey found that both groups, black and white, had reasonable knowledge of diet recommendations and nutrient sources. They were, less knowledgeable about the relationship between diet and disease and about choosing healthy foods daily (Peltzer , 2004) . In contrast with a similar study in India conducted by (Grover and Singh 2004 ; Nekasa ., 2012)

,where it was found only four percent of the rural mothers had high level knowledge, about twenty five percent had medium level while majority seventy one percent had low leve of knowledge

5.2.1.2 Nutritional knowledge about fat :

The teachers ask about fat type that must be cut down ,seventy five percent answered animal fat must be cut down, eleven percent vegetable fat must be cut down, fourteen percent not sure. Other study aim to analysis of nutrition habits of the teachers and nurses carried out in Ankara, show sixty nine point one percent of the teachers reported that they prefer plant oils rather than animal fat (Memis ,and sanlier 2008). Also ask them about version of dairy foods that people should eat sixty five percent stated low fat source should eat, seven percent full fat , mixed eighteen percent , dairy product should be cut down one percent, not sure nine percent .

Other study to determine adult's nutritional knowledge about dietary fats, cholesterol, fiber and energy, in Turkey , show over seventy percent of respondents knew that whole milk contains more fat than skim milk(Ozceliket and Ucar ,2008). The participants ask on some foods contain a lot of fat but no cholesterol , sixty seven percent stated" yes " , twenty seven point stated " not sure " , six percent stated "no" . American heart association (2005), cholesterol is only found in all foods that come from animal sources (Barnard ,2012) .Study done in Australia to understanding food principles and preparation found that the plants do not contain cholesterol, the rate of the respondents who knew that cholesterol is found in animal origin food such as meat and dairy products was found to be thirty percent (Brown, A. , 2000 ; Ozceliket and Ucar , 2008)

The participants ask about fat content in margarine and butter , seventy two percent of sample stated yes that margarine contain less fat than butter, fifteen percent stated no , thirteen percent not sure . Study to determine the adult's knowledge about dietary fats, cholesterol, fiber and energy in which the samples asked question "Which is higher in calories: butter or margarine

this question receive the highest number of incorrect answers was answered correctly by only twelve point seven percent of the individuals, eighty seven point three percent incorrectly . (Ozceliket and Ucar , 2008)

The participants asked about hard fat contain more saturated or unsaturated fat, sixty six percent selected saturated fat , eleven percent unsaturated fat , twenty three percent stated not sure. Study to determine the adult's knowledge about dietary fats, cholesterol, fiber and energy and knowledge about hard fat (solid at room temperature) show only thirty three percent of respondents answered the related question correctly and its' contain more saturated fat . (Ozceliket and Ucar , 2008)

In this study the participants asked on the type of food that contain more saturated fat about forty seven percent stated both vegetable oil and diary product contain more saturated fat, twenty five percent stated diary product contain more saturated fat, fifteen point eight percent stated vegetable oil, twelve point two percent not sure, about eighteen percent of sample stated that the fish lower fat option, fifteen percent chicken low fat option ,about two percent beef low fat , two percent selected lamb low fat . Study to determine the consumer knowledge and meat consumption at home and away from home, found that greater nutritional awareness amongst consumers led to reduced red meat consumption because contain high fat (Yen et al ., 2008 ; Memis and Sanlier 2010) .

Ask on which food type is more likely to raise people's blood cholesterol level, about seventy nine point five percent of participant stated animal fat, four point nine percent stated sweet , one point nine percent vitamin, about thirteen point seven percent not sure, study to determine the adult's knowledge about dietary fats, cholesterol, fiber and energy Ankara University , the rate of the respondents who knew that saturated fat that is found in animal origin food such as meat and dairy products was found to be thirty percent (Ozceliket and Ucar , 2008) .

Other study cholesterol is found only in animal origin foods such as meat, poultry, fish, organ meats (liver, brain and kidneys) dairy products and eggs. Plants do not contain cholesterol (Brown , 2000) .Study done by (Burkhart , 2010) .To assessment of nutritional knowledge and food skills in talented adolescent athletes. Massey University ,New Zealand ninety one percent of the participants know that eating too much fat can increase your body fat level, sixty nine percent know that most of the fat that an individual eats should be unsaturated fat and most were able to define each of the food in the term of it were high in saturated fat .

5.2.1.3 Nutritional knowledge about salt :

Knowledge of the salt content of commonly consumed foods it is more importance, the participants asked if a person wanted to reduce the amount of salt in their diet, which would be the best choice , eighty two point seven of participant stated the fruit is best choice, About seven point three percent fried eggs, five point one percent fried vegetables, canned food four point nine .Food knowledge survey was conducted on Australian consumers' to determine knowledge of food and health funded by the Australian research council the purpose of the survey was to see how much people know about the components of a healthy diet, most participants knew that sausages are high in salt eighty five point five percent , and there was confusion over pasta, which is low in salt fifty two point four percent answered correctly. About sixteen point nine 'yes' pasta contains salt. Fifty two point four no , thirty point eight percent 'not sure'.

About fifty seven point nine percent stated milk high in saturated fat, about twenty seven point five percent low, and fourteen point six percent not sure . About red meat about fifteen point one percent stated high fat content, about seventy three percent low content, and eleven point eight stated not sure. (Worsley, 2011). Two large-scale surveys conducted in the UK and the USA , reported that participants tended to identify foods with the highest amounts of sodium per serving as those that contribute most salt to the diet. In both surveys, fewer than fifteen percent of the participants could correctly identify bread and cereals as the major contributors of salt to

British and American diets ,With salt, most participants knew that sausages are high eighty five point five percent, and there was confusion over pasta, which is low in salt fifty two point four percent answer correctly. and spinach is low eighty four point nine percent . Sarmugam and worsley 2014)

5.2.1.4 Nutritional knowledge about protein

The participant asked on quantity of protein in milk type ,"there is more protein in a glass of whole milk than in a glass of skimmed milk, thirty nine point three percent stated " no" more protein in whole than skimmed milk , about thirty two point three percent stated "yes" twenty eight point four percent "stated not sure", study done by (Burkhart , 2010). To assessment of nutritional knowledge and food skills in talented adolescent athletes. Massey University ,new Zealand ,show forty three percent agreed that low fat milk was high in protein, forty percent no it is not high in protein, seventeen percent unsure .

5.2.1.5 Nutritional knowledge about fiber :

The participant ask on which would be the best choice for a low fat, high fiber snack, about six point six percent select yogurt as low fat and high fiber, about forty seven percent select digestive bisect low fat high fiber, twenty four point one percent select toasted bread as high fiber , one point nine percent select chesses, and bean about twenty point nine percent . Contracted with study to determine correlation between intake of dietary fiber and adherence to the Korean national dietary guidelines in adolescents , show cereals contain most of dietary fiber about thirty three point ninety seven percent, followed by about thirty three point forty five percent vegetables, fruits seven point forty eight percent, pulses five point sixteen percent, seaweed four point seventy eight percent, potatoes about four point nineteen percent, one point zero four percent, mushrooms , seeds and nuts point thirty five percent , oils point zero two percent, and seasonings about eight point eighteen percent. From animal product sources, milk and dairy

product contained the most fiber about point sixty eight percent, followed by meat point sixty five percent, and eggs about point zero Five percent. Toasted bread sixty three point seven percent. (Sunmi Park , et al . 2012). Study to compare of dietary fiber awareness, diseases and drugs interaction in rural and urban areas of Bangladesh, to detect the situation about knowledge, attitude and practices (KAP) of dietary fiber. Total about one hundred respondents were randomly selected from urban and rural areas and each area contain equal number of respondents, ninety six percent of the urban people gave the correct answer in compare to rural people when asked them about dietary fiber ,but about fifteen percent people have no knowledge about fiber. About forty two percent people have knowledge about the role of dietary fiber in human body in all stages of life especially in the disorder like constipation and obesity but fifty eight percent have no idea. About eighty five percent people comments carrots, vegetables, fruits and wheat as a source of dietary fiber where eleven percent indicate milk, meat and fish (Ahmad et al ., 2013).

5.2.1.1.6 Nutritional knowledge about sugar :

Only four percent people told sugar, rice and water are the source of dietary fiber. Knowledge about the sources of dietary fiber was higher among the urban people ninety four percent than rural people seventy six percent (Ahmed et al., 2013). The respondents asked on nutritional value of natural fruit juice as alternative to nature fruit about seventy three percent stated 'yes' it is concerned as alternative to fruit ,nineteen percent stated 'no'. About eight percent stated 'not sure, three prospective longitudinal cohort studies (Muraki, Isao, et al .2013) . Conducted at Harvard showed a significantly increased risk of type two diabetes when juices were consumed compared to whole fruits, fruit juice has also been linked to childhood obesity. The American journal of public health proposed that the healthy hunger-free kids act of 2010 in the United states eliminate one hundred percent fruit juices since it has been linked to childhood obesity, and substitute instead with whole fruits. Since juices do not contain fiber from the plants

In this study the sample ask on what food item that is beast choice when was trying to cut down on sugar in their diet ,about sixty six point five percent select digestive biscuit as best choice , About twenty nine point nine percent honey with toast, about three point six percent selected chocolate .

Study to determine nutritional knowledge, attitudes and practices of primary caregivers of home grown school feeding programmer pupils at Kenya, Kenyatta university show ninety six percent of the respondents had correct knowledge on local foods rich in carbohydrates, about ninety three percent on vitamins and eighty three percent on proteins. This finding shows that the respondents were more knowledgeable on the local foods rich in carbohydrates than vitamins and protein (Nekesa 2012).

5.2.1 .7 Nutritional knowledge about energy ,vitamin and minerals :

When asked about the roles of a number of food components , the subject showed differing level of knowledge, asked which food component contained the most energy, about thirty six percent of the participants knew that the fat has the high calories, about thirty two percent stated protein high calories approximately seventeen percent of participant stated the starchy food ,three percent stated fiber, twelve percent stated not sure. Study about dietary energy density is associated with energy intake and weight status in US adults., show the fat (9 kcal/g) is the most energy dense component of food, providing more than twice as many calories per gram as carbohydrates or protein (4 kcal/g) (Ledikwe JH, et al. 2006).

Food knowledge survey to determine the consumers' knowledge of food and health funded by the Australian research council show there was a lot of confusion around which nutrient is the most energy dense. Only twenty two point nine percent of participants knew that fat is the most energy dense nutrient (Worsley, 2011).

Results of overall basic nutritional knowledge on content of vitamin and minerals in bread type show eleven percent stated whole grain contain high vitamin and minerals, while eighty percent stated barley bread more vitamin and minerals, about nine percent not sure .Study to determine adult's knowledge about dietary fats, cholesterol, fiber and energy, whole grain bread contains more fiber and minerals than wheat. (Ozceliket , 2008). Other study on Sudanese students about nutritive value of bread, show them not usually distinguish between whole wheat bread and white bread; and they are not fully aware of the risks related to white bread. Available evidence revealed that whole wheat bread is associated with a lower risk of coronary heart diseases and it may decrease serum triglyceride concentrations (Elhassan et al .,2013)

Study to determine nutritional knowledge, attitudes and practices of primary caregivers of home grown school feeding programmer pupils at Kenya, show the Health workers encouraged the consumption of vitamin rich food to aid in quick recovery from illness. Some of respondents were not aware of specific vitamins and this is the likely reason for the differences in knowledge level pertaining to the vitamins (Nekesa ,2012) .Study done to assessment of nutritional knowledge and food skills in talented adolescent athletes Massey University, New Zealand, show twenty four percent of the subject correctly identified the function of vitamin and minerals (Burkhart. 2010).

When ask on amount of calcium in milk type about forty seven percent of respondent stated the amount of calcium in whole milk not different from skimmed milk, about twenty nine percent stated there is different in calcium, about twenty four percent stated not sure . According to calcium supplement guidelines, the calcium content of a food is unrelated to its fat content. One cup of whole, two percent, one percent or fat-free milk all contain about the same amount of calcium(Farrell and houtkooper). The participant have good information on source of calcium, when asked on amount of calcium in food ninety two percent stated milk rich source of calcium,

three percent meat , five percent fruit. Study to evaluation of nutrition knowledge and perception of good food Among nursery school pupils in municipality-Kenyat advance, the participant were asked to identify food and food supplement recommended for child suffering from rickets , thirty two percent of teacher chose the correct answer (cod liver oil and milk) Anyango 2011) .

About forty five point five percent of the subject not have idea on antioxidant vitamins and twenty point one percent have idea, About thirty four point four percent not sure. Study to evaluation of nutrition knowledge and perception of good food among nursery school pupils in municipality-Kenya advance the teachers did not a basic knowledge of foods rich in vitamin A and C, suggesting that the teachers need a better training about sources of critical vitamins and minerals for healthy living (Anyango 2011) .

Study to assessment of nutritional knowledge and food skills in talented adolescent athletes. Massey University, New Zealand show forty two percent of the subject correctly identified the function of vitamin and minerals (Burkhart.S,2010).

5.2.2 Nutritional attitude :

The subject ask a number of question on basic nutritional attitude , when ask about the roles of number of the food components, the subject showed differing levels of answer ,

5.2.2 .1 Nutritional attitude about food eating :

In question ask "what should be eating more, the same amount, or less of these foods" the participant gave difference answer, eighty seven point two percent of participant stated vegetable eat more than other food, eighty three percent eating more fruit ,about sixty two point three percent eating more high fiber food. About forty one percent stated the meat should be eating equally, starchy food thirty four point two percent should be eating equally, about four point

three percent eating more meat, other study to determine the association between nutrition and physical activity knowledge and weight status of primary school educators south African, indicated only four point six percent of educators correctly believed that eating starchy food at most meals was recommended (Abrahams et al ,. 2014). about fatty food eighty three percent of participants indicated fatty food should be eating leas amount, About fifty eight percent starchy food should be eat leas amount ,sugary food eighty one percent should be eat equally, and ninety three percent salty food should be eat equally.

Constricted with other study aim to compare the knowledge, attitude, practice of nutrition and non-nutrition student towards a balanced diet in Hail University , Saudi Arabia , show only nine percent of the total participants took fruits, yellow, green and red vegetables in their diets. About fatty food a considerably large number of girls fifty four percent ate fried and fatty foods in their diets either daily or three to four times /week. About thirty three percent of the girls eat vegetables rarely, whereas twenty five percent of the girls rarely took fruits in their daily diets. Forty five percent of the nutrition students knew the fact that a balanced diet consists of foods from all the food groups including fruits, vegetables, meat and other varieties, as against only twenty nine percent of non- nutrition students., about two percent of the participants feel that eating meat only is a good diet, while thirteen percent feel that only vegetables and fruits consumption is a balanced diet . (Alshammari et al .,2013) .

Food knowledge survey was conducted on Australian consumers' to determine the knowledge about food and health and was to see how much people know about the components of a healthy diet, show the most participants select eat more vegetable eighty seven point eight percent, fruit eighty five point two percent, seventy six point five percent and high fiber foods seventy five point seven percent, and less highly processed fatty foods about eighty six point nine percent, sugary foods eighty five point one percent, salty foods eighty point five percent and starchy foods about sixty point nine percent (Worsley , 2011) .

5.2.2 .2 Nutritional attitude about nutritional value :

The participants ask on which higher nutritional value, olive oil or butter, about seventy two percent select olive oil, nineteen percent select butter, four percent select same, and five percent select not sure. Contrasted with study to determine the use and knowledge of olive oil and other lipids in a collegiate student population ,Georgia state University that aim for determine lipid knowledge among graduate versus undergraduate students. Of graduate fifteen point four percent indicated that they did not know the contents of olive oil, and twenty three point one percent responded incorrectly, and sixty one point six percent responded correctly MUFA(mono unsaturated fatty acid and polyphenols).Of undergraduate sixty seven point four percent responded that they did not know the answers, about eleven point six percent responded incorrectly, and about twenty point nine percent responded correctly.

The differences in olive oil knowledge between graduate and undergraduate was statistically significant (Pearson Chi-square, P=0.001). Of graduate, seven point seven percent indicated that they did not know what butter contained, while seventy six point nine percent responded correctly (saturated fat). Of undergraduate, about thirty two point six percent responded that they did not know the answers, and about forty eight point forty percent indicated the correct answer. The difference in butter knowledge between graduate and undergraduate was not statistically significantly different. (Benyazzam ,2010).

5.2.2 .3 Nutritional attitude about fat :

About nineteen percent of participants stated 'not sure' when ask on amount of fat in pasta, forty eight point three percent stated 'low', thirty three percent high. according to protein , carbohydrate and fat counter a half cup of pasta contain half gram of fat About fifty five percent of participant stated the bread contains 'low' amount of fat, thirty one point four percent stated 'high', about thirteen point six percent 'not sure '. About sixty six percent of participant stated 'low' fat in bean, about nineteen percent 'high', not sure fifteen percent . according to protein , carbohydrate and fat counter, half cup of beans contain half gram of fat

About seventy three percent of participant stated nut 'high' in fat, nineteen percent stated 'low ', about eight point five percent' stated not sure'. according to protein , carbohydrate and fat counter two table spoon of nut contain eight point nine gram of fat . The participant ask about which food type that are high fat content , about fifty five point five percent of respondent stated the honey low in fat, and twenty one point five percent high content, twenty three percent not sure . According to protein , carbohydrate and fat counter one table spoon of honey contain total fat zero percent . About fat content in egg seventeen percent of respondent stated not sure , thirty one percent select low fat in egg , and fifty two percent stated high fat content in egg . According to protein , carbohydrate and fat counter whole egg contain about five gram of fat . Other study to determine adult's nutritional knowledge about dietary fats, cholesterol, fiber and energy., Ankara, Turkey , show egg yolks contain cholesterol. (Ozceliket and Ucar 2008). Study to assessment of nutritional knowledge and food skills in talented adolescent athletes, at Massey University New Zealand, show thirty one percent of participants stated yes nut is high in saturated fat (Burkhart , 2010) .

The participants answer about food content of saturated fat, about eighty one percent of teachers stated that full cream milk contain high saturated fat ,fourteen percent low Saturated fat, five percent not sure about sixty one percent of sample stated that olive oil low in saturated fat ,thirty two percent high saturated content , about seven percent not sure , red meat eighty one percent high saturated fat about eleven percent low saturated fat ,eight percent not sure , margarine fifty nine percent high content ,twenty nine percent low content, twelve percent not sure , chocolate about eighty five percent high saturated fat ,nine percent low content six percent not sure . Study to determine adult's knowledge about dietary fats, cholesterol, fiber and Energy show sixty five percent stated yes chocolate it is high in saturated fat about sixteen percent 'no', nineteen percent not sure. (ozceliket and Ucar 2008) .Study to determine the effects of nutrition education on 6^{th} graders knowledge of nutrition in nine-year primary schools in Slovenia, show the students know that margarine, oil and butter belong to the group of foods containing fats (Koka et al ,2011).

National health and medical research council (NHMRC, 2006) conducted that the saturated fat they are the main types of fat that found in foods such as milk, cream, cheese, meat from most land animals, palm oil and coconut oil as well as in pies, biscuits, cakes and pastries .

5.2.2 .4 Nutritional attitude about sugar :

The knowledge on food containing carbohydrate's is more importance in diabetes control and body weight ,to determine the knowledge level of participants, some of question on sugar food content asked to them , about fifty nine percent stated 'yes' banana contain carbohydrate (CHO), about twenty seven percent stated no about fourteen point three percent stated not sure , according to protein , carbohydrate and fat counter one each banana contain twenty three point seven gram of sugar.

Question about ice cream eighty one percent of participants stated it is high" in sugar content, about nine percent low , about ten percent not sure , according to protein , carbohydrate and fat counter half cup of ice cream contain eighteen point sex gram of CHO. · About eighty two point three percent of respondent stated the yogurt low in sugar, ten point two percent stated "high" in sugar, about seven point five percent "not sure ", study done to determine nutritional knowledge, attitudes and practices of primary caregivers of home grown school feeding programmer pupils at Kenya, show ninety six percent of the respondents had correct knowledge on local foods rich in carbohydrates, about ninety three percent on vitamins and eighty three percent on proteins.(Nekesa , 2012) . Other study one cup of yogurt contain eleven point four gram of carbohydrate (Yen et al .,2008) .

About forty nine percent of respondents stated the ketchup contain high amount of sugar, about twenty three percent low, twenty eight percent not sure. According to protein , carbohydrate and fat counter one table spoon of ketchup contain four point two gram of carbohydrate ,point one gram of protein and point two gram of fat . About sixty six point three percent of participant stated the natural fruit juice "low" in sugar content, about twenty five point four percent stated" high" in sugar ,and eight point three percent "not sure".

The respondents ask if these food is starchy food about ninety four percent of the subject stated the pasta as good source of starchy food ,about ninety percent stated the rice is starchy food , about twenty four point two percent nut stated as starchy food . About seventy five percent margarine not starchy food , about eighty one percent chesses not good source for starchy food source ,contracted with study to assessment of nutritional knowledge and food skills in Talented adolescent athletes. Massey University, New Zealand found ninety five percent Of subject correctly agreed that carbohydrate is found in bread, rice and cereals (Burkhart. , 2010) .

5.2.2 .5 Nutritional attitude about salt :

The participants ask about which food type contain high salt, about twenty eight percent of respondent stated yes pasta contain salt , fifty percent state " no" about twenty two percent" not sure" .About thirty percent of respondent stated 'yes' meat contain salt, about forty eight percent 'no', about twenty two percent stated 'not sure'. About ninety percent stated cheeses high salt than other food, about four percent stated 'no' ,about six percent not sure . About seventy two percent 'yes' sausage high in salt, about ten percent 'no', eighteen percent not sure . Fish forty three point six percent 'yes 'contain salt, vegetable forty percent 'yes' contains salt.

5.2.2 .6 Nutritional attitude about protein :

The participant select the plant sources as good source for protein eighty four point two percent stated the bean as good source for protein, chicken eighty one percent, and cheeses fifty seven point four percent . Study to determine nutrition knowledge, attitude and practices among students of AHFAD university for women in Omdurman province thirty five percent of study sample did not know which food contain protein other than meat (Elhassan , et al. 2013). About seventy nine point five percent of the participant select the bean as item alternative to red meat and good source of protein , fifty five percent select the liver , about forty one point five percent cheese ,about forty point four percent nut alternative to red meat.

Compared with study to determine the effects of nutrition education on sixth graders knowledge of nutrition in nine-year primary schools in Slovenia on health diet that determine the effects of nutrition education ,show the participant seem to know well which typical food of animal origin are good source of protein (egg , meat ,fish) (Koka et al ., 2011) .

Canadian study done by (Malik, S.P, 2000). To assessment of mission nutrition, showed that nursery school teachers tend to be aware of sources of proteins and carbohydrates better than other nutrients .

5.2.2 .7 Nutritional attitude about fiber :

The participants asked on what the food contain high fiber, about fifty percent stated the banana contain fiber, about thirty two percent stated "no", and eighteen percent " not sure ". On fiber content in meat forty six percent stated "meat not contains fiber", about twenty nine percent stated" yes", about twenty five percent not sure. Study to determine adult's Knowledge about dietary fats, cholesterol, fiber and energy , Ankara University, over seventy percent of respondents knew that fruit contains more fiber than meat (Ozcelik, and Ucar 2008) .

About the fiber in egg sixty percent of respondent stated "no" fiber in egg, about fourteen percent stated yes , twenty six percent "not sure ,and sixty two percent of respondent stated the corn high in fiber, eighteen percent low, and twenty percent not sure. Study done by (Alfaddagh and AlIsa , 2014) .To determine nutritional Knowledge among Kuwait college students, wheat, corn, and rice bran are high in insoluble fiber, which helps prevent constipation .

5.2.2 .8 Nutritional attitude about diet diseases related :

The participants ask if these foods reduce the chances of getting certain kinds of cancer about seventy percent select yes more vegetable reduce cancer incidence ,about thirteen percent no, seventeen percent not sure reduced cancer chance. About sixty two percent stated "yes" more fiber reduced cancer, thirteen percent no ,twenty nine percent not sure About thirty three point three percent stated "yes" less fruit reduced cancer, forty five point three percent stated "no"

,and twenty one point four percent not sur ,eating less Additives seventy point one percent yes, thirteen point one percent no , and sixteen point four percent not sure reduce cancer .

Participants ask on food that prevent heart disease, about eighty one percent heave knowledge that more fruit and vegetable reduced heart disease, six percent no, and thirteen percent not sure, about seventy one percent stated less salt reduced heart disease, fourteen percent no, and fifteen percent not sure . About seventy percent stated eating less saturated fat, eighteen percent no ,twelve percent not sure . About sixty eight percent stated less additives prevent heart disease, about fourteen percent no about eighteen percent not sure .

Study to determine the nutrition knowledge among a sample of urban black and white south Africans. The adults have less knowledge in making healthy daily food choices, and may also allude to a lack of knowledge about the association of disease and nutrition (Peltzer K 2004 ; Abrahams et al 2014) . A large epidemiological study of 42,000 of participants found that dietary fiber from fruits or vegetables had no effect on the risk of diabetes. (Ascherio et al., 1997 ; Benyazza , 2010).Study to assessed the changes in intake of fruits and vegetables in relation to risk of obesity and weight gain among middle-aged women. A twelve-year study, found that "participants with the largest increase in fruit and vegetable intake had about twenty four percent of lower risk of becoming obese compared with those who had the largest decrease in intake after Adjustment for age, physical activity, smoking, total energy intake, and other lifestyle variables (Colditz GA, et al ., 2004) .

Study found the normal-weight adults consume more fiber and fruit than their age- and height-matched overweight/obese counterparts. Journal of the American dietetic association showed that normal-weight adults consume more fiber and fruit than obese adults (Davis, and Jaimie , 2006) . Study to determine the nutrition knowledge among a sample of urban black and white South African have less knowledge in making healthy daily food choices, and may also allude to a lack of knowledge about the association of disease and nutrition (Peltzer K 2004 ; Abrahams et al 2014)) .

5.2.3 Nutritional practice

About fifty four percent of respondents on diet control, thirteen percent no ,thirty three percent not sure ,the teacher had ask question on nutrition practice as how many number of serving from fruit and vegetable taken per day, about ten percent answer one serving from fruit and vegetable per day, twenty percent answer two serving from fruit and vegetable /day, thirty percent answer three serving from fruit and vegetable /day, forty percent answer four serving from fruit and vegetable per day .

Other study to determine the serving number of fruit and vegetable taken per day which is done on students of AHFAD University in Sudan (Elhassan , 2013) , show the answer about vegetables about thirty eight percent daily, about thirty nine point one percent , two – three times per day, eighteen point three percent once /week, about four point six percent never and Fresh fruits twenty five point one percent daily , about thirty nine point four percent , two – three times per day thirty point three percent once per week ,about five point one percent never .

Study to determine nutrition-related knowledge, attitudes, and dietary practice among head start teachers in Texas was implemented by head start educators who teach the nutrition education curriculum and encourage healthy eating behavior, the head start educator's survey in the USA found that less than half of educators knew the number of fruits and vegetables servings to be eaten daily **(**Sharma et al., 2013 ; Abrahams et al ., 2014**)** .

The teacher had ask on amount of water drinking per day ,about twenty percent of teachers drink two – four glasses of water per day while sixty percent drink five – seven glasses. About eleven percent drink eight and more . About nine percent of teachers drink one glass of water or less .And asking on number of meal per day about thirty two percent of teachers skip dinner ,forty percent skip breakfast, eighteen percent skip lunch and only, ten percent of teachers don not skip meals . Ask about food type that consumed at high frequencies on daily basis included

bread sixteen percent ,fresh vegetables twelve percent, coffee eight percent and rice about seven point eight percent, egg seven point one percent .

It was observed that teacher consumed bread more than other food. Fresh vegetables consumed by teacher more than fruit , milk three percent, cheese six point four percent yogurt six point two percent , about eight point five percent consumed coffee more than tea four point three percent ,chicken three point eight percent and beef four point six percent consumed more than fish and lamb one point four percent . Other study in Sudan show the top five ranking foods consumed at high frequencies included bread about ninety one point four percent , milk forty four point nine percent , fresh vegetables about thirty eight percent cheese thirty four point nine and eggs about seventeen point seven percent .(Elhassan ,2013). The participant ask if they required nutritional education to achieve health eating , about fifty percent of the respondents stated yes , thirty percent stated no and twenty percent not sure Other study to determine nutritional knowledge, attitudes and practices of home caregiver in Kenya show about point eight percent of the respondents strongly agreed, about ten point seven percent agreed while eighty six point three percent disagreed and two point two percent strongly disagreed with the statement 'Nutrition education is not required to achieve health eating . (Nekesa , 2012)

Chapter six

Conclusion and recommendation

6. Conclusion and recommendation

Up to our knowledge this study represents a first step in identifying the nutritional knowledge , attitudes ad practice of primary female teachers in Benghazi, based on the result of this study the teachers are more conscious about carbohydrate (CHO) ,fat ,dietary fiber. And it show that the fat give more calorie than other nutrients .

The participants have good information on food containing calcium , fat and salt . About number of serving from fruit and vegetable taken per day, forty percent answer four serving from fruit and vegetable per day .

While they have low level of knowledge about nutritive value of food as describe the natural fruit juice have same nutritive value fresh fruit and also the knowledge of female teacher on antioxidant vitamin and protein are low and as they consider the bean contain more protein than chicken, and an consider the bean alternative to meat rather than liver . the participant not known the importance of the breakfast as 40% skipped. Will 60 % drink about five to seven cup of water per day .

The majority of participants have good knowledge on nutrition as related to cancer and heart disease prevention, and on food type that recommended to eating in more amount as fruit and vegetables . Based on the findings of the study, it is recommended the knowledge of target female in different age in order to increase their awareness about disease related to diet . It is also recommended for the people to consulted a dietitian for food importance to their heath and to participate in nutrition education programs and lectures , also watch programs on television about the nutrition education .

Chapter seven

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Appendix

Appendix I

Research questionnaire

1. Age …. …. 2 . Nationality ……

3. Are you
(a) single (b) married (c) divorced (d) widow

4. Number of children …..

5.Education level : Diploma high diploma university other

6.Wight… 7. Height ….

8. Are you on a special diet yes no sometime

9. Do you have information on nutrition disease related ? Yes no not sure

10 Do you think health experts recommend that people should be eating more, the same amount, or less of these foods?.

	More	Same	Less	Not sure
Vegetables				
Sugary food				
Meat				
Starchy food				
Fatty food				
High fiber food				
Fruit				
Salty food				

11. How many servings of fruit and vegetable do you eat each day ….

12. Which fat do experts say is most important for people to cut down on? (tick one)

(a) Vegetable fat
(b) Animal fat
(c) not sure

13. What version of dairy foods do experts say people should eat? (tick one)
(a) full fat
(b) lower fat
(c) mixture of full fat and lower fat
(d) neither, dairy foods should be cut out
(e) not sure

14. Do you think these are high or low in sugar?

	High	Low	Not sure
Bananas			
Un flavored yoghurt			
Ice-cream			
ketchup			
natural juice			

15 . Do you think these are high or low in fat?

	High	Low	Not sure
Pasta			
beans			
meat			
Honey			
egg			
Nuts			
Bread			
cheese			
margarine			

16. Do you think experts put these items in the starchy foods group?

	Yes	No	Not sure
Cheese			
Pasta			
Butter			
Rice			
Nut			

17. Do you think these are high in salt?

	yes	no	Not sure
Fish			
Sausages			
Pasta			

Red meat
Frozen vegetables
Cheese

18. Do you think these are high in protein?

	yes	no	Not sure
Chicken			
Cheese			
Fruit			
Bean			

19. Do you think these are high in fiber?

	yes	no	Not sure
Cornflakes			
Bananas			
Eggs			
Red Meat			
Nuts			
Fish			
Chicken			

20. Do you think these fatty foods are high in saturated fat?

	yes	no	Not sure
Whole milk			
Olive oil			
Red meat			
margarine			
Chocolate			

21 Some foods contain a lot of fat but no cholesterol.
(a) yes
(b) no
(c) not sure

22 Do you think experts call these a healthy alternative to red meat?

Yes No Not sure

Liver
beans
Nut
Low fat cheese.

23 .A glass of fresh fruit juice counts as alternative of fruit
yes no nut sure

24 .There is more protein in a glass of whole milk than in a glass of skimmed milk .

Yes no nut sure

25 . Margarine contains less fat than butter

Yes no not sure

26. Which of these breads contain the most vitamins and minerals? (tick one)

Barley bread Wholegrain bread not sure

28 . Which do you think is higher in nutritional value .

Margarine olive oil not sure

29. There is more calcium in a glass of whole milk than a glass of skimmed milk .

yes no not sure

30 . Harder fats contain more: (tick one)
(a) Saturates
(b) Un saturates
(d) Not sure

31. Which one of the following has the high energy ? (tick one).
(a) protein
(b) Starchy foods
(c) Fiber
(d) Fat
(e) Not sure

32. Fats are mainly found in: (tick one)
(a) Vegetable oils
(b) Dairy products
(c) Both (a) and (b)
(d) Not sure

33.Which would be the best choice for a low fat, high fiber snack? (tick one)

(a) yoghurt
(b) Bisect
(b) Toast
(c) Beans
(d) cheese

34 . If a person wanted to reduce the amount of sugar in their diet, which would be the best choice

(a) honey on toast
(c) Digestive biscuit
(d) Chocolate

35 . If a person wanted to reduce the amount of salt in their diet, which would be the best choice

Fried eggs
Fried vegetable
Fruit
Canned vegetable

36 . Which items would be the best choice as a lower fat option.

Fish
Beef
Chicken
Lamb

37 Do you think these help to reduce the chances of getting certain kinds of cancer?

	Yes	No	Not sure
Eating more fiber			
Eating less fruit			
More vegetables			
Eating less preservatives/additive			

38 Do you think these help prevent heart disease?

	Yes	No	Not sure
Eating more fiber			
Eating less saturated fat			
Eating less salt			
Eating more fruit and vegetables			
Eating less preservatives/additives			

39 . Which one of these is more likely to raise people's blood cholesterol level? (tick one)

Vitamin
Sweet
Animal fat
Not sure

40 Have you heard of antioxidant vitamins

Yes no not sure

41 How much amount of water drinking per day

1. Drink 2-4 glasses of water per day
2. Drink 5-7 glasses
3. 8 and more
4. Drink one glass of water or less

42. which the meal type are that skipped per day

1. Skip dinner
2. Skip breakfast
3. Skip lunch
4. Do not skip meals.

43.Slecte food type that consumed at high frequencies on daily basis .

1. Tea	2. Coffee	3. Fruit	4.Vegetable	5. Yoghurt	6.cheese	7.milk	8. beef
9. lamb	10. Egg	11. Bread	12. Chicken	13. lentil	14. Bean	15. Rice	16. Fish

44 . Are the teacher required nutrition education to achieve health eating .

Yes no not sure

Appendix II

24 hour diet record (modified)

On special diet: yes no not sure

Please record all food intake over the past 24 hours .

Meal time	**Details of food intake**
Breakfast	
Lunch	
Dinner	

الخلاصة

المقدمة الامراض المرتبطة بالغذاء تقتل الملايين من الأمريكيين كل عام والسبب الرئيسي هو ان العديد من الناس لا يدركون الدور الرئيسي الذي يلعبه الغذاء في الصحة .هناك العديد من الدراسات تهدف لتحليل الوعي التغذوي للناس اعتمادا على طرح اسئلة متعلقة بالوعي التغذوي. **الهدف** تقيم الوعي التغذوي والسلوكي والادراكي للمعلمات في مدينة بنغازي. **الطريقة** دراسة مقطعية تستهدف المعلمات في مدينة بنغازي خلال الفترة ما بين فبراير ال مارس (2014) عدد المشتركات 500 معلمه معدل الاستجابة 93% ، العمر ما بين 18 ال 60 سنة، 44% من المشتركات كن يحملن الشهادة الجامعية ، الوزن ، الطول ، معدل كتلة الجسم وحساب الاحتياج اليومي من السعرات الحرارية ونسبة الدهن والنشويات والبروتين المحتاجة خلال اليوم تم حسابها لكل مشركة .**الاستنتاج** المشتركات في الدراسة لديهن معلومات جيدة حول السكريات والدهون والاملاح والالياف الغذائية ولكن لديهن معلومات اقل حول الفيتامينات المضادة للأكسدة والبروتين والقيمة الغذائية الاكل .

الوعي التغذوي والسلوكي والتطبيقي لمعلمات الصف الابتدائي

في مدينة بنغازي .

قدمت من قبل :

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المشرف:

د. تونس ميدان

قدمت هذه الرسالة استكمالا لمتطلبات الحصول على درجة الماجستير في التغذية .

جامعة بنغازي

كلية الصحة العامة

اغسطس 2018