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THESIS SUBMITED TO THE SCHOOL OF FOOD TECHNOLOGY, NUTRITION AND BIO-ENGINEERING, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF A BACHELOR OF SCIENCE DEGREE IN HUMAN NUTRITION OF MAKERERE UNIVERSITY, KAMPALA

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DECLARATION

I Luwalo Nelson Mandela (13/U/7650/PS) do declare that his thesis is my original work and has not been presented for the award of a bachelor's degree in any other University or Institution of higher learning.

Signature .... Date 26TH |11|2018

Supervisors

This thesis has been submitted for review with my approval as

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DEDICATION

I dedicate this thesis to my parents, Mr. and Mrs. Oloya, All the teachers who taught me all the way from primary to secondary levels, all lecturers of Makerere University especially those attached to Human Nutrition Deprtment for making me who I am today. Thank you for your unending support. May the almighty bless you all.

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ABSTRACT

A case study was conducted among the adolescent refugees from South Sudan in Adjumani district to investigate their nutritional status and dietary practices

A cross sectional survey was conducted utilizing both qualitative and quantitative data collection methods through sampling of adolescents from three refugee settlements (Ayilo, Maaji and Mungula). Pretested questionnaires were used to collect data from 50 respondents from each settlement. SPSS was used to clean and analyse the data. Frequencies and chi-square were the methods used to present the data.

From the study, most of the respondents (74%) had a normal nutritional status using BMI for age Z score >-2<+2 and also a high number of respondents (84%) had normal MUAC readings (>18.5 cm for adolescents from 11 years to 14 years, >21.0 for adolescents aged 15-17 years and >22 for adolescents aged 18-19). Respondents (46%) failed to meet their daily recommended fruit and vegetable servings. This was attributed to the high cost of fruits and vegetables.

Occupation impacted on respondents' dietary diversity which could be attributed to the fact that most of them were students. This can be attributed to the nutritional education they underwent.

The study shows the poor health and nutritional status among the adolescents. Periodical concerted efforts towards their nutrition along with focused health education will improve the health and nutritional status of these adolescents.

NUTRITIONAL STATUS AND DIETARY PRACTICES OF ADOLESCENT REFUGEES IN ADJUMANI DISTRICT

CHAPTER ONE

1.0: Introduction

A refugee is "a person who is outside his/her country of nationality or habitual residence and has a well-founded fear of persecution because of his/her race, religion, nationality, membership in a particular social group or political opinion; and is unable or unwilling to avail himself/herself of the protection of that country, or to return there, for fear of persecution" (Kia-keating et al., 2004). Adolescents are a group of people between 10 and 19 years of age (WHO, 2011).

Adjumani is one of the districts in Uganda hosting 18% of the total Refugee population; the refugees are mainly from the Republic of South Sudan. It has 11 refugee settlements with a total population of 224,343 of refugees compared to the population of nationals which is 168,917(Early & Ser., 2015). Refugees in adjumani are of diverse ethnic background which includes Dinkas, Kuku, Nuer, Kakwa, Madi and Siluk and they all have similar ethnicity with locals such as Acholi, Madi, Kuku, and Lugbara (Min, Biyaya, & Richard, 2012).

Adjumani as one of the West Nile regions that has suffered a number of hazards which has generally affected the livelihoods of the communities in the region leading to reduced income levels, and reduced food production making them more vulnerable to food insecurity. The overwhelming influx of refugees from South Sudan and Democratic Republic of Congo(DRC) has disrupted the livelihoods of the hosting communities as social services become inadequate to cater for the large number of displaced people being settled (Martin Owor et *al.,* 2017).

Political violence in civil war and ethnic conflicts has generated millions of refugees across the African continent with unbelievable pictures of suffering and unnecessary death. War usually disrupts or frequently destroys social life, human livelihood. Disrupted agriculture and food supplies produce famine and chronic malnutrition resulting in increased individual susceptibility to disease. Refugee crisis has meant large scale dis-placement of disparate groups who are then compelled to live in close proximity to each other where Food and shelter are usually very limited (Kalipeni & Oppong, 1998), The South Sudanese instability has become the largest and most complex emergency in Africa. Recent and continuing violence has generated new displacement. The majority of South Sudanese refugees have

sought safety in Uganda. By the end of March 2017, the country was hosting 852,300 South Sudanese refugees and is struggling to cope with the ever-increasing needs. Host communities and humanitarian agencies are struggling to feed and shelter the refugee arrivals and provide basic services (Appeal, 2017).

According to UNHCR and the Office of the Prime Minister (OPM), South Sudanese refugees arriving in Uganda report general insecurity, limited access to food and basic services, violence, rape and abuse of women and girls, arbitrary detention, indiscriminate killing and destruction of property by armed forces as reasons for fleeing their homes. South Sudanese refugees indicate that due to insecurity they are unable to use the main roads to the border but they are rather forced to walk through the bush for several days, with few belongings and limited access to food, water and other needs (UNICEF, 2017).

South Sudanese have suffered traumatic experiences resulting from forced migration and young people, in particular, seem to have been more susceptible to these harrowing experiences than adults who have developed some coping strategies or resilience. Although South Sudanese youth are trying to adjust to their new environment and culture, they are also expected by their parents to follow their traditions and customs. Acculturation is a leading source of stress for new settlers as they struggle to adjust to their new country (Adusei-asante, Doh, & Klutsey, 2017).

Among this continually growing population, young refugees are an extremely vulnerable group. Overall figures are approximate due to the difficulties in obtaining statistical data on populations in flux; however, the reported numbers of refugee youth are particularly concerning. Data on the actual numbers of displaced youth is inaccurate because of transiency, lost or destroyed records, and incomplete information. While many organizations do not collect specific data on youth, a third (33%) of the population of displaced individuals is thought to be between the ages of 10 and 24; over half (51%) are under 18 years. A disturbing number of refugee youth are orphans or travelling alone, thus, they are very vulnerable to exploitation (Marshall, 2016).

Poor nutrition among adolescents resulting in short stature and low lean body mass is associated with many concurrent and future adverse health outcomes including poor reproductive output among women (Medhi, Hazarika, & Mahanta, 2007).

1.1: Problem statement

Malnutrition is in all age groups. The under-five age group is systematically targeted for nutritional interventions in the majority of complex emergencies. Older children and adults however, are often not targeted systematically or are excluded completely (Stang & Story, 2005) and yet biological, psychosocial and cognitive changes that begin during puberty and continue throughout adolescence directly affect nutritional status and nutrient needs. Adolescents experience dramatic physical growth and development during puberty because of the many biological changes which occur including sexual maturation, increases in height and weight, completion of skeletal growth accompanied by a marked increase in skeletal mass, and changes in body composition (Stang & Story, 2005), which in turn appreciably increases their requirements for energy, protein, and many vitamins and minerals (Massey-stokes, 2016).

Current dietary behaviours and practices observed in adolescents may have detrimental consequences on their health. The adverse health consequences that may result from excessive intake of soda and sweetened beverages; fast-food consumption; inadequate intakes of fresh fruits, vegetables, fiber rich foods, and dairy and other calcium-rich foods; reduced levels of physical activity; and increasing obesity rates indicate a need to revisit the diet and lifestyle characteristics of this age group (Rampersaud, Pereira *et al.,* 2005).

1.2: Objectives

1.2.1: Aim

- To determine the adequacy of the diets of adolescent refugees in Adjumani

1.2.1: Specific objectives

   i.   To determine the nutritional status of adolescents among South Sudan refugees in Adjumani district.
  ii.   To determine the dietary practices of adolescents among South Sudan refugees in Adjumani district.
 iii.   To determine the extent to which adolescent refugees meet their dietary needs for carbohydrate, proteins, fat and vitamins.

1.3: Research questions

1. What is the nutritional status of adolescent refugees in Adjumani district?
2. What are the dietary practices of adolescent refugees in Adjumani district?
3. Are adolescents meeting the requirements for a minimum diet?

1.4: Significance of the study

This study will provide baseline information on the nutritional status and dietary practices of adolescent refugees on which further research can be carried out. Addressing the identified causative factors and implementations of recommendations from this survey can lead to the improvement of the nutritional status of the adolescent refugees. The study findings can be used to inform policies and interventions by the public and private sectors, and non-government organizations aimed at improving the nutritional status of adolescents and the refugee communities as a whole.

CHAPTER TWO

2.0: LITERATURE REVIEW

Biological, psychosocial and cognitive changes that begin during puberty and continue throughout adolescence directly affect nutritional status and nutrient needs, Adolescents experience dramatic physical growth and development during puberty, which in turn appreciably increases their requirements for energy, protein, and many vitamins and minerals and the adolescents also experience significant changes in their ability to assess and comprehend complex situations and information and in their desire to become independent, unique individuals (Mates, 2015). Growth during adolescence is faster than at any other time in a person's life except the first year. Good nutrition during adolescence is critical to cover the deficits suffered during childhood and should include nutrients required to meet the demands of physical and cognitive growth and development, provide adequate stores of energy for illnesses and pregnancy, and prevent adult onset of nutrition-related diseases (Rukhsana, 2006).

2.1: Importance of Sound nutritional status

Nutrition is an important determinant of human mental performance. Especially during aging, dietary compounds prevent or delay age-related cognitive impairment, which is known to result from changes in the diet, whether they are short term (breakfast in the morning), middle term (iron to ensure oxygenation) or long term (fatty acids changing brain structure and functions) (Bourre, 2006).

Low birth weight (LBW) can be due to a short gestation (prematurity), an intra-uterine growth retardation, or a combination of both. The causes of term low birth weight are multifactorial and include race/ethnicity, maternal height and weight, general morbidity, and health behaviors such as gestational weight gain and caloric intake, cigarette smoking and alcohol consumption (Hyman & Dussault, 2000). Poor nutrition among adolescents resulting in short stature and low lean body mass is associated with many concurrent and future adverse health outcomes (Dambhare *et al.,* 2010).

Improvement in nutritional status before and during pregnancy can improve pregnancy outcomes, including maternal death, fetal death and preterm delivery, experienced by pregnant adolescent. In populations with a higher proportion of adolescents or adults, the general rations provided may provide insufficient energy. In addition to energy needs, the requirement for many micronutrients, including vitamin A, thiamine, riboflavin, niacin, folic

acid, vitamin B12, vitamin C and iodine, reaches levels required by non-pregnant adults. Moreover, rapid growth produces a higher requirement among adolescents 10–14y of age for calcium than any other population age group except pregnant women (B. A. Woodruff & Duffield, 2002).

Poor nutrition of a woman is a known cause of Low Birth Weight specifically; short maternal stature, low pre-pregnancy Body Mass Index (BMI), and low weight gain are among the most important determinants of LBW. When adolescent growth and pregnancy coincide, the mother and fetus compete for nutrients. If the woman has a child at an early age this further reduces her opportunity to reach an optimal body size with adequate nutrient stores before pregnancy, and thereby giving birth to LBW infants (Win *et al.*, 2013).

Growth of pelvic bones continues in adolescence for several years after menarche, it is reasonable to think that young age might be implicated, at least among those who are not physiologically mature. Short stature is associated in women with small pelvises and a higher risk of obstructed labor. It is a major cause of maternal deaths in developing countries, for instance. Height is a better predictor of risk of obstructed labour than age. It can also be added that maturity may be delayed in malnourished adolescent girls, which further increases the risk (WHO, 2005).

Adolescents have rapid growth in stature, muscle mass, and fat mass during the peak of the adolescent growth spurt, the requirements for some nutrients is as high or higher in adolescents than in other age groups. Between 10 and 19 years of age, the requirement for many micronutrients, including vitamin A, thiamine, riboflavin, niacin, folic acid, vitamin B12, vitamin C, and iodine, reaches levels required by non-pregnant. In many cultures, a large proportion of girls have their first pregnancy during adolescence therefore improvement in nutritional status at this stage can improve pregnancy outcomes, including maternal death, fetal death, and preterm delivery, experienced by pregnant adolescents (Woodruff & Duffield, 2000).

 Anemia and iron deficiency result in severe health problems in adolescent refugee populations and account for a substantial proportion of deaths among young children and women of childbearing age. As a result, outbreaks of various micronutrient deficiency conditions occur in many displaced populations who are dependent on food supplied by humanitarian agencies (Woodruff et al., 2006).

Insufficient daily consumptions of food have been found to affect health status and poor health and nutritional status may hinder a child's ability to learn. Nutritional deficiencies in childhood and adolescence can affect later behavioural development and the acquisition of social skills. There is evidence that early childhood malnutrition, stunting, underweight, and anaemia are negatively associated with cognitive development, appropriate behaviour and academic attainment in later childhood (Abudayya *et al.,* 2011).

Adequate vitamin D levels protect against musculoskeletal disorders, infectious and autoimmune diseases, cardiovascular diseases, types 1 and 2 diabetes mellitus, several types of cancer, neurocognitive dysfunction and mental illness, as well as infertility and adverse pregnancy outcomes in adolescents (Hegemon *et al.,* 2013). Food insecurity work summarized above, indicates that food insufficiency is associated with higher prevalence of fair/poor health, and iron deficiency, and with greater likelihood of experiencing stomachaches, headaches, and colds in children (Frank, 2008).

Vitamin A, and more particularly its precursor, betacarotene, contribute to the stabilisation of biological membranes. Vitamin A and the carotenoids (among them betacarotene, provitamin A) participate with other micronutrients (notably vitamins E, C, and selenium) in the protection of tissues, in particular nervous tissues, from aggression by free radicals or active forms of oxygen (Bourre, 2006).

It was also reported that poor dietary habits negatively influence self-esteem and academic Achievement (Kristjánsson *et al.,* 2010). Diet can also affect cognitive ability and behaviour in children and adolescents. Nutrient composition and meal pattern can exert immediate or long-term, beneficial or adverse effects. Beneficial effects mainly result from the correction of poor nutritional status. For example, thiamine treatment reverses aggressiveness in thiamine-deficient adolescents (Benton, 2011).

It's estimated that 75% to 90% of the cardiovascular disease epidemic is related to dyslipidemia, hypertension, diabetes mellitus, tobacco use, physical inactivity, and obesity; the principal causes of these risk factors are adverse behaviours, including poor nutrition (Gidding et al., 2013).

Dietary fibre is vital because of its effect on possible diet related diseases. The insoluble dietary fibre has long been known to relieve constipation and is believed to be beneficial in reducing the incidences of colon cancer. Soluble dietary fibre may dissolve in the body fluids.

It helps in reduction of cardiovascular diseases and diabetes (Oniang, Mutuku, & Malaba, 2003)

2.2: Dietary habits of Adolescents

Food preferences are the product of interplay between genetic and environmental factors that result in substantial individual differences (Scaglioni *et al.,* 2011). Concern was expressed over the eating habits of refugee children and teenagers in that many enjoyed food that was high in calories and low in nutritional value, such as ''fast food.'' (Yerpude et al., 2013). Acculturation has been implicated in immigrant adoption of 'bad' habits, such as smoking, high fat diets and substance abuse (Hyman & Dussault, 2000). Angular stomatitis is common among adolescent refugees due to the poor eating habits and lack of food diversity (Blanck *et al.,* 2002).

Alcohol consumption - amount and patterns has been largely ignored in the small literature on adolescent food habits yet it is by far the most important factor in mortality of anything providing nutrients that they ingest. No-one is going to die if their calcium intake is low but alcohol abuse is one of the major health problems of adolescents, along with violent death and injury, drug abuse, unwanted pregnancies and sexually transmitted diseases (Vrcibradic & Almeida, 2006).

2.3: Factors affecting dietary habits

It has long been recognized that food availability and cultural factors are dominant in food selection. Cultural influences lead to differences in the habitual consumption of certain foods and in traditions of preparation, and in certain cases can lead to restrictions such as exclusion of meat and milk from the diet (Lau *et al.,* 1984).

 Food is a focus of social interaction, and the consumption of ''prestige'' foods may become an index of social status (Sanjur, 1982).

The system of provision, including food production and manufacture, marketing, delivery and sale, has been shown to have a major impact on what people eat (Fine & Leopold, 1993).

At the individual level, taste or sensory appeal, likes and dislikes, and sheer habit are all relevant (Krondl & Lau, 1982). Taste may be particularly important in selection of high fat diets, since fats are responsible for the texture and aroma of many foods (Drenowski, 1992). On the other hand, 'healthy'' diets may be consumed for non-health reasons such as concern

about appearance (Cockerham, Kunz & Lueschen, 1988). Weight control is a major determinant of food choice for individuals concerned about their body weight.

CHAPTER THREE

Methodology

Study area

The study was conducted in Adjumani District located in Northern Uganda. Adjumani has 11 refugee settlements with a total population of 224,343 of refugees compared to the population of nationals which is 168,917. Agriculture is the main economic activity of Adjumani district. Refugees in the district benefit from the support of United Nations' agencies and other donors, as well as from the generosity of host countries that offer them asylum.

The district has been selected purposively because of the reportedly high number of refugees with high numbers of teenagers. Four health centres were used for the research from within the refugee settlements.

Study design

The study was a cross-sectional survey utilizing both qualitative and quantitative data collection methods. Face to face individual interviews was conducted by the interviewers using pretested survey tools.

Sample size determination and selection

A total of 150 adolescents from 3 refugee settlements (Ayilo, Maaji and Mungula) were used to obtain information in this study. Chosen respondents met the following criteria:

- Adolescents aged (10-19 years)
- The adolescent were refugees
- Only 1400 adolescents were considered for sampling.
- Refugees of Adjumani were legible for this study.

The sample size was obtained according to the criteria below (Bartlett *et al,* 2001):

$$\text{NO} = \frac{t \times t}{d \times d} \times s \times s$$

Where t = value for selected alpha level of .025 in each tail = 1.96 (the alpha level of .05 indicates the level of risk the researcher is willing to take that true margin of error may exceed the acceptable margin of error.)

Where s = estimate of standard deviation in the population = 1.4. (Estimate of variance deviation for 7-point scale calculated by using 7 [inclusive range of scale] divided by 6 [number of standard deviations that include almost all (approximately 98%) of the possible values in the range].

Where d = acceptable margin of error for mean being estimated = .21. (Number of points on primary scale * acceptable margin of error; points on primary scale = 7; acceptable margin of error = .03 [error researcher is willing to except]).

Using the calculated values in the table, the sample size for a population of 1400 with a s=1.4 and d the margin error of 0.21

$$NO = \frac{1.96 \times 1.96}{0.21 \times 0.21} \times 1.4 \times 1.4$$

$$NO = 170$$

Therefore, for a population of 1400, the required sample size is 170. However, since this sample size exceeds 5% of the population, Cochran's (1977) correction formula will be used to calculate the final sample size. These calculations are as follows:

$$N = \frac{NO}{1 + \frac{NO}{study \cdot population}}$$

$$N = \frac{170}{1 + \frac{170}{1400}}$$

$$N = 151$$

Where study population size = 1400.

Where NO = required return sample size according to Cochran's formula= 170.

Where N = required return sample size because sample is > 5% of population

Therefore, the sample size will be 150.

This sample size is adequate to reach saturation of information on the nutritional status, dietary practices of teenaged refugees.

Sampling procedure for obtaining respondents

All the adolescents from the 3 settlements were given a chance to pick numbers ranging from 1-10. Simple Random sampling was done where by everyone who picked number 5 on the list was selected to form the final sample of 150 respondents. Every respondent was given equal chances of being selected.

Administration of the survey tools

A pretested questionnaire was used to collect data from the participants to obtain their dietary practices and diet adequacy whereas nutritional status was determined using

Anthropometric measurements (*Height*: Height was measured using a vertical measuring rod with headpiece without wearing footwear. The adolescents were asked to stand on flat surface, heels together and head positioned so that the line of vision is perpendicular to the body. The arms hanged freely by the side, and the head, back, buttocks, and heels were in contact with the vertical measuring rods. The individuals were asked to inhale deeply and maintain a fully upright position. The movable headpiece was brought onto the topmost point on the head with sufficient pressure to compress the hair. Height was recorded to the nearest 0.1 cm.

Weight: Weight was recorded using a digital SECA balance. The accuracy of weighing machine was checked in every session against known weight. The

Adolescents were asked to stand still in centre of the scale without support, with the body weight evenly distributed between both the feet. Weights were taken with standard minimal clothing required to maintain privacy. They were also asked to remove the shoes, sock etc. Weight was recorded to the nearest 0.1kgs). Nutritional status was assessed using WHO recommended anthropometric indicators.

The weight and height were then used to calculate BMI for age in order to determine the nutritional status.

 Mobilization and appointment for the interview was done from the communities where by the researcher who introduced himself to the subjects and sought for their consent two days prior to the interview. All the data was collected by the researcher.

Data analysis/ Statistical Analysis

The data collected was entered and analysed using SPSS version 20. Microsoft excel to charts and graphs. Chi-square was used for determining the interaction between the nutritional status and dietary practices of the participant.

CHAPTER FOUR

4.1: Results and Discussion

4.1 Demographic characteristics of the participants

The demographic characteristics of the participants are summarized in (Table 1)

Table 1: Socio demographic characteristics of the study population

Characteristic	Category	% population
Age	below 18 years	88.7
	above 18 years	11.3
Education level	Primary	62.7
	Secondary	31.3
	Tertiary	6.0
Caretakers' occupation	Peasant	47.3
	Business woman/men	42.7
	Employed	10.0
Participants' occupation	Farmer	6.0
	Housewife/husband	26.7
	Student	46.3
	Businesswoman/man	21.0

According to the demographic characteristics of the respondents, majority (46%) of the respondents were students and this implies that they are always being taught about good dietary practices

4.2: Nutritional status of the participants

Table 2: Showing the distribution of MUAC among the respondents

Majority of the respondents had a normal nutrition status.

|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MAM	24	16.0	16.0	16.0
	Normal	126	84.0	84.0	100.0
	Total	150	100.0	100.0	

Majority (84.0%) of the respondents had an acceptable MUAC (≥ 21 cm) reading. This was presumably due to the fact that they may have followed the nutrition education that was offered to them during the general food distributions and during the community dialogues every month by the various NGOs implementing nutrition. MUAC is a good indicator of the protein reserves of a body, and a thinner arm reflects wasted lean mass, i.e. malnutrition. Also since the respondents were refugees, they could be having enough food from the general ration to feed on hence a good MUAC reading (Sebire et al., 2001)

Table 3: showing the distribution of BMI for Age values of the respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<-2(MAM)	3	2.0	2.0	2.0
	>-2<+2(Normal)	114	76.0	76.0	78.0
	>+2<-3(Overweight)	32	21.3	21.3	99.3
	>+3(Obese)	1	.7	.7	100.0
	Total	150	100.0	100.0	

Figure 2: showing the distribution of BMI for Age of the respondents

Most of the respondents had a normal BMI for their age.

BMIforAge

0.67%
2.00%
21.33%
76.00%

Legend:
- <-2(Under nourished)
- >-2<+2(Normal)
- >+2<-3(Overweight)
- >+3(Obese)
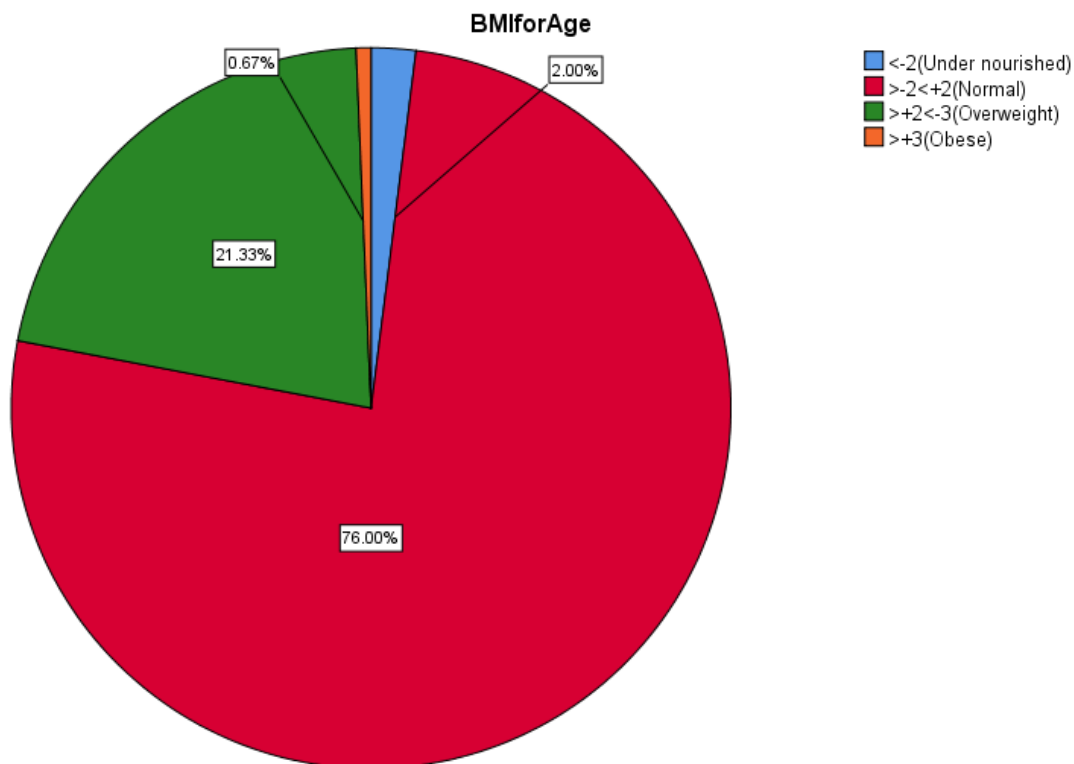
Many of the respondents (76%) had a weight for height (Figure 1) with a mean BMI for age Z score >-2. The high percentage of the normal weight individuals among the respondents may be attributed to the fact that these respondents are taking the nutrition and health messages given to them from within the community and in schools seriously and it is always in the local languages that they can is easily understood by them.

Age, education level, participants and caretakers' occupation did not show any significant association with MUAC (P = 0.88) and BMI (P = 0.858). Given the above two indicators/ measurements are the most commonly used indicators of nutrition status, it can be suggested that that the individual's nutritional status does not depend on the work he/she does or on the level of education. The same was observed by Afework *et al.,* (2013) who indicated that nutritional status of study participants according to MUAC classifications had no significant association with maternal educational status, occupation and age, The probable reason for this

could be the interventions on maternal health, nutrition and other women empowering programs by the government as well as other non-governmental organizations (Macro 2006).

4.3: DIETARY PRACTICES

**Table 2: Consumption of daily servings of different food groups in 24 hours**

Food group	Proportion of respondents that had the recommended daily servings		
	Less	Adequate	Excess
Cereals and grains	13.3	66.0	20.7
Fruits	85.3	14.7	0.0
Vegetables	100.0	0.0	0.0
Meat, poultry, fish	73.3	26.7	0.0
Milk and milk products	78.0	14.7	7.3
Legumes, nuts	57.3	30.0	12.7

From the above table, it can be generalized that grains and cereals followed by legumes and nuts were consumed most compared to other food groups. This may presumably be due to the fact that cereals like sorghum, maize, rice and legumes like beans and soya are the most popularly consumed foods in the community since they are part of the food basket being given to the refugees by World Food Program (Kairye, 2011). However, meats, milk and poultry were least consumed; probably because of scarcity and cost of these foods as reported by most respondents. The other reason may be because this region is a poverty struck hence people sells their entire animal like goats and chicken being given to them by other Livelihood organizations to get money for buying other basic needs. This makes the individuals miss out on the high biological value proteins hence poor nutritional outcomes

Consumption of foods from different food groups

Figure 3: Showing frequency of the consumption of different food groups

In this study, 89% respondents ate grains and cereals on daily basis, 9% consumed meat, fish and poultry monthly and 38% consumed legumes daily.
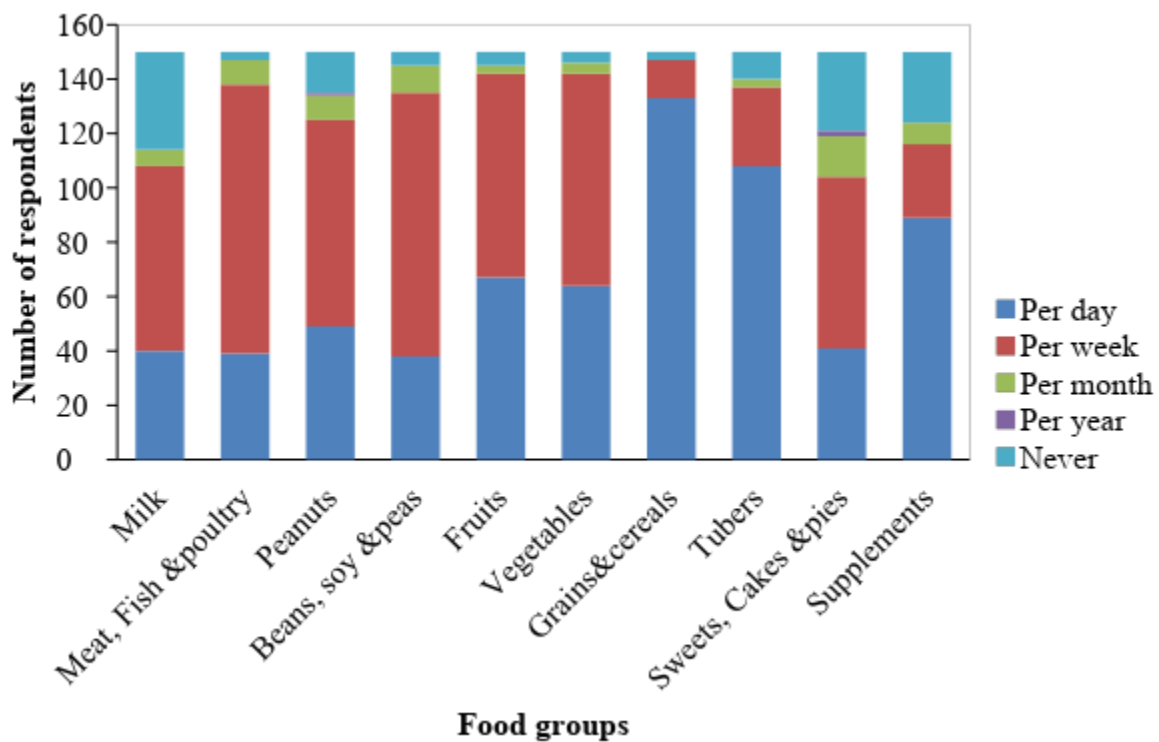
Frequency of consumption of different food groups

Some studies indicate that most adolescents have personal preferences for fast foods which are cheaper as compared to healthy foods like fruits and vegetables which are generally more expensive (Shepherd *et al*., 2006). The snacking behavior may presumably be due to the (1) increased sell of these fast foods in the camp and by the roadside (2) reduced prices of these snacks hence affordable and (3) travelling back to Juba and to other places most of the times hence snacking along the way to those places. Changes in overall weight and dieting attitudes and diet-related practices, such as increased snacking have been observed in most of the adolescents (George *et al*., 2005). Educational interventions, such as culturally-sensitive and language-appropriate classes and workshops that can help to educate refugees on nutritious food items, food preparation, and how nutrition affects health, Practical approaches to assist in the development of better dietary habits and may help to improve the health outcomes and quality of life of refugee populations (Rondinelli et al., 2011)

It could also be due to poverty and lack of land for practicing back yard farming as most respondents claimed they cannot afford fruits and vegetables despite of the nutritional knowledge that they have as stated by (George *et al*., 2005)

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1: Conclusion

The study shows the poor nutritional status among the adolescents. Periodical concerted efforts towards their nutrition along with focused health education will improve the nutritional status of these adolescents from South Sudan.

5.2: Recommendations

Educational interventions, such as culturally-sensitive and language-appropriate classes and workshops that can help to educate refugees on nutritious food items, food preparation, and how nutrition affects health, may all be practical approaches to assist in the development of better dietary habits and may help to improve the health outcomes and quality of life of refugee populations.

Provision of seeds and seedlings for fruits and vegetables to the refugees by the NGOs such as LWF, Action Against Hunger and PLAN International so that they can improve on their intake of fruits and vegetables.

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