



NIGERIA JOURNAL OF HOME ECONOMICS (Nig-JHEC)

Vol. 7, No 2, June, 2019

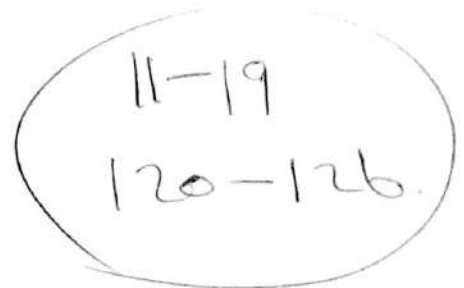
**A PUBLICATION OF
HOME ECONOMICS PROFESSIONAL ASSOCIATION OF NIGERIA (HEPAN)**

NIGERIA JOURNAL OF HOME ECONOMICS

(Nig-JHEC)

Vol. 7, No. 2, June, 2019.

ISSN: 978-37772-6-0



A Publication of
Home Economics Professional Association of Nigeria (HEPAN)

NIGERIA JOURNAL OF HOME ECONOMICS (Nig-JHEC)

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Published by:

Home Economics Professional Association of Nigeria (HEPAN)

Printed by:

NIEPA

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The above notes are subjects to review by the editorial board from time to time

Professor Lilian I. Salami
Editor in Chief

THE INFLUENCE OF DIETARY HABIT ON NUTRITIONAL STATUS OF PRESCHOOL CHILDREN IN ILORIN-EAST LGA OF KWARA STATE

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Abstract

The study investigates the influence of dietary habit on Nutritional Status of pre-schoolers in Ilorin-East LGA of Kwara State. Three research questions were raised and two hypotheses formulated and tested at 0.05 level of significance. The Survey research design was adopted for the study and the population comprised of all mothers and pre-schoolers from under five (5) clinics randomly selected from four wards in Ilorin East Local Government Area of Kwara state. A multistage sampling technique was used in selecting a total of 100 respondents. The instruments used were Questionnaire tagged 'Children's Eating Behaviour Questionnaire' (CEBQ), Food Frequency Questionnaire, and Anthropometric Measurement. The instrument had reliability index of 0.75. Findings reveals that 76 % children has very good food responsiveness ($\bar{x}=19.67$), 82% of the children enjoy food very well ($\bar{x}=16.46$), 69% has good Emotion over eating, ($\bar{x}=12.32$), while 61% are fair in Food fussiness ($\bar{x}=19.91$) enjoys a wide variety of foods. Findings revealed that malnutrition rates for wasting stunting and underweight were low as moderate and severe wasting, stunting and underweight rates were all below 20% while the children have normal weight for height, normal height for age and normal weight for age of 87%, 85% and 77% respectively. Findings also revealed that dietary habits had significant influence on the nutritional status of the preschool children. ($p<0.05$). Result also shows that there is significant influence of mothers' knowledge about nutrition on children's dietary habits. ($p<0.05$). The study concludes that dietary habit of preschool children influences their nutritional status. It was recommended that parents should consult a registered dietitian for nutrition counselling and make sure their children's meals at home are balanced.

Keywords: Dietary Habit, Nutritional Status, Preschool Children, Parents, Nutritional Knowledge.

Introduction

Dietary Habit represent a general profile of food and nutrient consumption, characterized on the basis of the usual eating habits. Dietary habit can further be defined as quantities, proportions, variety, or combination of different foods, drinks, and nutrients in diets, and the frequency with which they are habitually consumed. Dietary habit represent the ways individuals or groups of people select, prepare, consume and generally use food available to them. For proper growth and development, children's diets are important to ensure overall health and well-being. Dietary habit of children affects their risk for a number of health problems, including obesity, iron deficiency, and dental caries, Early nutritional deficits during the first 2 years of life causes stunting, wasting, and impairment in growth and health. Inadequate nutrition also lowers resistance to infectious disease, and may adversely affect the ability to function at peak mental and physical ability (World Health Organization (2003). Ikorok, Eka, Ogunjimi, & Udoh, (2012) confirmed that children with good dietary habits manifest socially, mentally, and physically alert personality.

Nutrition is the science of food, the nutrients and other substances therein, their action, interaction and balance in relation to health and disease, and the processes by which the organism ingests, absorbs, transports, utilizes and excretes food substances (Lagua and Claudio, 2004).

Nutritional status is the balance between the intake of nutrients and the expenditure of these in the processes of growth, reproduction, and health maintenance. Malnutrition is the condition that results from eating a diet in which certain nutrients are lacking (under nutrition), in excess (over nutrition), or in the wrong proportions (Eto, 2004). There are two major types of under nutrition: i. Protein-energy malnutrition (PEM) - resulting from deficiencies in any or all nutrients and ii. Micronutrient deficiency diseases-resulting from a deficiency of specific micronutrients. Children with moderate or severe malnutrition have an increased risk of mortality (Eto, 2014). Appropriate feeding practices during early childhood stimulate psycho-social development, lead to good nutritional status, physical growth, reduce susceptibility to common childhood infections and improve resistance to cope with them (St-Onge, Keller & Heymsfield, 2003).

Undernutrition is defined by an insufficient provision of energy and nutrients, such as protein with essential amino acids, vitamins, minerals, micronutrients and ability to meet the requirement of the body to ensure growth, maintenance and specific functions. Childhood undernutrition remains a public health problem in Nigeria, as the status did not improve substantially during the last two decades. The implications of this unrelenting situation for the well-being of children are unacceptable because undernutrition contributes to the high rates of morbidity, disability and mortality among children. In addition, undernutrition constrains people's ability to fulfil their potential, as it is also associated with impaired growth, mental development and school performance among children. One to five years of age is a period when eating patterns will influence health in later life-stages. (Maynard, Gunnell, Ness, Abraham, Bates, Blane (2006)

According to Ekpenyong (1998), nutritional behaviour refers to food consumption habit, choice or selection or the adopted pattern of eating by different groups of people in the community. In this study, therefore, dietary habits refer to choice or taste and actual food consumption practice of preschool children. Nutrition specifically identified the need to prevent and control the increasing public health problems of chronic diseases by promoting appropriate diets and healthy lifestyles using all the classes of Nutrient. (WHO, 2003). The classes of nutrient include Carbohydrates, Protein, Fats, Minerals, Vitamins and Water. Carbohydrates are a molecular class that includes sugars, starch and fibre. Sources include fruits, vegetables and grain products (such as whole grain breads and cereals, rice and pasta). Proteins are basic foundations or building block of many body structures that is, muscles, skin and hair. Protein sources, they include: meat, fish, tofu, soy-product, eggs, legumes and dairy products. Fats may be classified as saturated or unsaturated depending on the detailed structure of the fatty acids involved. Sources of fat include cooking oils, fat, butter, fatty meat and fish. (Nelson, and Cox, 2000).

Vitamins and minerals are recognized as essential nutrients necessary in the diet for good health. Minerals are segregated into two major groups; macro-minerals and micro-minerals.

Macro-minerals are essential in elative quantity usually referred to as "bulk nutrients". Examples of such nutrients include; calcium, chlorine, magnesium, phosphorus, sodium, sulphur. These elements are required in recommended dietary allowance (RDA) greater than 200mg/day. Trace minerals are elements needed in small amounts usually because they play a catalytic role in enzymes, and required in amounts less than (RDA) 200g per day (Lippard and Berg, 1994). They include; cobalt, chromium, iodine, iron, manganese, molybdenum, nickel, selenium, vanadium, zinc.

Vitamins are categorized into two groups according to their solubility. The four fat-soluble vitamins (soluble in nonpolar solvents) are vitamins A (retinal), D (calceferol), E (tocopherol), and K (phyloquinone). The water-soluble vitamins (soluble in polar solvents) are vitamin C (ascorbic acid) and the eight B-complex vitamins: vitamin B1 (thiamine), vitamin B2 (riboflavin), vitamin B3 (niacin), vitamin B5 (pantothenic acid), vitamin B6 (pyridoxine), vitamin B7 (biotin), vitamin B9 (folic acid), vitamin B12 (cobalamins). Deficiency in them could result in disease conditions such as goitre, scurvy, osteoporosis, impaired immune system, disorders of cell metabolism, certain forms of cancer, symptoms of premature aging, poor psychological health amongst others. Sources of minerals and vitamin include foods such as liver, fortified milk, sweet potatoes, spinach, fruits and vegetables. (Shils, 2005). Water provides the medium in which nutrients and waste products are transported throughout the body. Water allows for temperature regulation, the maintenance of blood pressure and blood volume. Water is ingested in drinking water, foods, beverages and fruits and vegetables. (Harvard School of Public Health, 2011)

Ekch (1996) and Ekpenyong (1998) suggested that preschool children neither possess adequate knowledge of nutritional values nor can practise good dietary habit without their parents. Thus, if the parents do not have nutrition knowledge the children with improper dietary habit may have retarded growth or become obese, manifest poor health development, poor eye sight, skin blemishes, and reduced appetite, among others and children with good dietary habits can manifest socially, mentally, and physically alert personality. Wardle, Guthrie, Sanderson, & Rapoport (2001) identified eight-factor structure

dietary habit in children which are Food responsiveness (FR), Enjoyment of food (EF), Emotional overeating (EOE), Desire to drink (DD) Satiety responsiveness (SR), Slowness in eating (SE), Emotional under eating (EUE) and Food fussiness (FF).

According to Roday (2009) Diet is kinds and amount of food and beverages consumed every day. It is a controlled routine of food and drink, as to gain or lose weight or otherwise influence health. Adequate diet is required of the pre-schoolers for their growth and proper development. Eating behaviour, or appetite, has been proposed as one mechanism through which genes influence obesity susceptibility. In particular, individuals who inherit a more avid appetite high responsiveness to external food cues and low sensitivity to internal satiety (fullness) processes may be more likely to take advantage of the multiple eating opportunities presented by the modern environment, and consequently gain more weight.

The findings of this study may be of benefit to the: pre-schoolers, mothers, caregivers, Home Economist, Health workers, Policy makers Community, and the society. The findings of this study may help the policy makers to develop practical nutrition programmes that may help mothers and caregivers improve dietary habit of their children. Considering the above aspects, the present study aimed to identify pre-schoolers' Dietary habit in Ilorin East LGA and how it affects their nutritional status.

Objectives of the study

The main objective of this study was to investigate the Influence of Dietary Habit on Nutritional Status of Pre-schoolers in Ilorin-East LGA of Kwara State.

Specifically, the objectives were to:

1. Determine the dietary habits of preschool children in Ilorin-East LGA of Kwara State.
2. Determine influence of parents' nutritional knowledge on the dietary habit of pre-school children in Ilorin-East LGA of Kwara State.
3. Determine the influence of dietary habit on the nutritional status of preschoolers through their anthropometric status.

Research Questions

The following questions provided guidance for the study.

1. What are the dietary habits of preschool children in Ilorin-East LGA of Kwara State?
2. Does parents' nutritional knowledge influence the dietary habit of pre-school children in Ilorin-East LGA of Kwara State?
3. How does dietary habit influence the nutritional status of preschoolers in Ilorin-East LGA of Kwara State?

Hypotheses

The following null hypotheses were formulated for the research questions.

H₀₁: Parents nutritional knowledge will not significantly influence the dietary habit of preschool children (1-5 Years Olds) in Ilorin-East LGA of Kwara State.

H₀₂: Dietary Habit will not significantly influence the nutritional status of pre-schoolers (1-5 Years Olds) in Ilorin-East LGA of Kwara State.

Methods

The design used for this study is survey research design. The study sought to establish what relationship existed between dietary habit and nutritional status of Pre-schooler children (1-5 years old) The population of the study comprised of all mothers and pre-schoolers from under five (5) clinics or centres from Ilorin East Local Government Area of Kwara state numbering one thousand and four. Simple Random Sampling Technique was used to select four (4) wards in Ilorin East Local Government Areas. (Ibagun, Gambari I, Gambari II, and Ojuekun/Sarunmi wards). One under five clinics or center was purposefully selected from each of the wards in the Local Government making four (4) clinics/centers. (Basic Health Center, Okelele, Center Igboro, Karuma, and Ajikobi). Twenty-Five (25) mothers and preschool children were randomly selected from each clinic to make a total of one hundred mothers of preschool children. Representing 15% of the population.

Questionnaire tagged Children's Eating Behaviour Questionnaire (CEBQ), food frequency questionnaire (FFQ), and Body Mass Index (BMI) of a sample of preschool children

were the instrument used for data collection for this study. The questionnaire designed to measure the eating styles of children was adapted from Wardle, Guthrie, Sanderson, & Rapoport (2001) using eight-factor structure of Food Responsiveness (FR), Enjoyment of Food (EF), Emotional overeating (EOE), Desire to drink (DD) Satiety responsiveness (SR), Slowness in Eating (SE), Emotional Under Eating (EUE) and Food Fussiness (FF). The Food Frequency Questionnaire (FFQ) provided information on the regular eating pattern of the children from their mothers. Information on the specific foods consumed and their frequency of consumption was obtained from the Food Frequency Questionnaire (FFQ). From the pilot study conducted for the instrument, reliability index of 0.75 was obtained. Height and weight of all preschool children was measured to calculate Z-scores for height-for-age (stunting), weight-for-height (wasting), weight-for-age (underweight) and BMI-for-age using a vertical measuring tape in cm and weighing scale for weight. Measurements were made without shoes/footwear. It was recorded to the nearest 0.1 kg. Weight and height of the children were taken

and compared with WHO Child Growth Standards (WHO, 2010). A cut-off of less than minus two standard deviations ($-2SD$) was used to define stunting (length/height-for-age Z-score), wasting (weight-for-length/height Z-score), and underweight (weight-for-age and BMI-for-age Z-scores) and a cut-off of above $+2$ Z-score was used to define overweight (weight-for-length/height and BMI-for-age Z-scores). Data collected was analysed with descriptive statistics such as, frequencies, percentages, mean, ($\bar{X}$) standard deviation (SD) and inferential statistics.

The Null Hypotheses formulated in the study were tested with Pearson Product Moment Correlation Statistics (PPMC) and Analysis of Variance (ANOVA). All null hypotheses were tested at 0.05 level of significance at which the null hypotheses were either be rejected or accepted.

Results and Discussion

The mean age of the mothers is 38.47 years with majority (42.0%) being between 36-40 years of age, most (57.0%) of the preschool children are male while 43.0% are female with an average age of 3.67 years.

Research Question One:What are the dietary habit of preschool children (1 -5 Years Olds) in the study area?

Table 1: Percentages, mean and standard deviation of children's' eating habits.

Dietary Habit	Fair (%)	Good (%)	Very Good (%)	Mean	Standard Deviation	Ranking	Remark
Food Responsiveness	-----	24(24)	76 (76)	19.67	4.348	2 nd	Very Good
Enjoyment of food	1(1)	18(18)	82(82)	16.46	4.290	3 rd	Very Good
Emotion over eating	10(10)	69(69)	21(21)	12.32	4.576	7 th	Good
Desire to drink	4(4)	60(60)	36(36)	9.7	3.588	8 th	Fair
Satiety Responsiveness	20(20)	55(55)	25(25)	15.45	6.689	4 th	Good
Slowness in eating	36(36)	38(38)	26(26)	12.53	4.446	6 th	Good
Emotion under eating	9(9)	53(53)	38(38)	12.97	3.699	5 th	Good
Food fussiness	-----	61(61)	39(39)	19.91	7.318	1 st	Very Good

Table 1 showed that 76% of the children has a very good food responsiveness ($\bar{x}=19.67$), the attitude of 82% of the children to enjoyment of food is also very good ($\bar{x}=16.46$), 69% has good Emotion over eating that is eat more when emotional ($\bar{x}=12.32$), while 60% has good desire to drink this is rated as fair considering the mean

($\bar{x}=9.7$), 55% has good satiety responsiveness that is child finishes his/her meal very quickly ($\bar{x}=12.53$), 53% ($\bar{x}=15.4$), 38% are slow in eating ($\bar{x}=12.97$), and 61% eat without Food fussiness ($\bar{x}=19.91$) that is enjoys a wide variety of foods

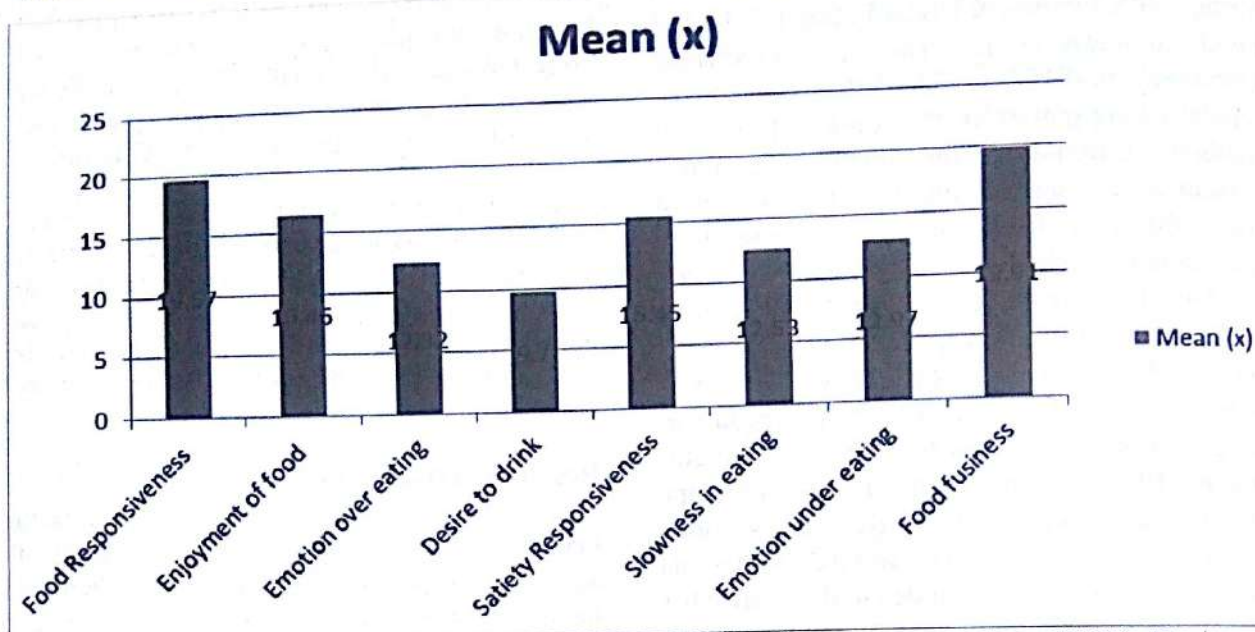


Figure 2: Summary of the mean scores of children's eating habits.

Fig 2 revealed the mean scores of children's eating habits based on eight-factor structure of Food responsiveness (FR), Enjoyment of food

(EF), Emotional overeating (EOE), Desire to drink (DD) Satiety responsiveness (SR), Slowness in eating (SE), Emotional under eating (EUE) and Food fussiness (FF) The full explanation is in table 1.

Research Question 2: Does parents' nutritional knowledge influence the dietary habit of preschool children in Ilorin East LGA of Kwara State

Table 2: Distribution of responses based on Nutritional Knowledge of parents of Preschool children

N	Statement	SA	A	D	SD	$\bar{x}$	Standard Deviation	Remark
1	The six types of nutrients needed by the body are protein, carbohydrate, fat and oil, minerals and vitamins.	48	30	18	4	3.22	0.883	Agreed
2	Sources of protein include meat, beans, fish, eggs, snails, milk, and soya beans.	50	25	17	8	3.17	0.99	Agreed
3	Protein is the necessary substance for body growth in children	30	40	21	9	2.91	0.93	Agreed
4	Rice, cassava, yam, maize, cocoa yam, millet, and wheat are energy giving food items	47	40	13	0	3.34	0.70	Agreed
5	Energy giving foods help in performing activities requiring weight	62	20	16	2	3.42	0.83	Agreed
6	Protective foods are fruits, sea foods, calcium, iron, salts and vegetables	49	35	11	5	3.28	0.85	Agreed
7	Good nutrition involves eating a variety of food in the right proportion.	72	15	5	8	3.51	0.92	Agreed
8	Water helps in easy food digestion	60	20	17	3	3.35	0.90	Agreed

SD=Strongly Agreed, A=Agreed, D=Disagreed, SD=Strongly Disagreed

Table 2 reveals the nutritional knowledge of mothers of preschool children with mean result based on the Four-Likert scale rating scale of 2.5 and above. A mean rating of less than 2.5 is

considered disagreed while a mean rating above 2.5 is considered as agreed. The result showing a mean range of ($\bar{x}$ =3.59-2.91 indicated that the parents are well knowledgeable in nutrition.

Research Question 3: How does Dietary Habit influence the Nutritional Status of Preschoolers in Ilorin-East LGA of Kwara State?

Table 3: Influence of Dietary Habit on the Nutritional Status of Preschoolers in Ilorin-East LGA.

	Weight for Length/Height			Length/height for Age			Weight for Age		
Gender	Wasting			Stunting			BMI for Age		
	Normal	Moderate	Severe	N	M	S	Normal	Under weight	Over weight
		<-2 SD	<-3 SD		<-2 SD	<-3 SD		<-2 SD	>+2 SD
Male 57	49	04	04	46	09	02	45	11	01
Female 43	38	03	02	39	03	01	33	08	03
Total 100	87	07	06	85	12	03	77	19	04

N=Normal, M= Moderate, S=Severe.

Hypotheses Testing

Hypothesis One: Parents nutritional knowledge will not significantly influence the dietary habit of pre-schoolers (1-5 Years Olds) in the study area.

Table 4: Analysis of variance on Influence of mothers' nutritional knowledge on dietary habit of pre-school children

Source	Sum of square	Df	Mean square	F cal	p-value	Decision
Between Groups	0.4009	7	0.0572	0.0912	0.033	Significant
Within Groups	57.7113	92	0.6273			
Total	58.1122	99				

Significant at $p < 0.05$

The result of the ANOVA test in Table 4 shows that there is significant influence of mother's knowledge on children's dietary habits. Thus hypothesis 2 is rejected based on the Fcal of

0.0912 and p-value of 0.033 ($p < 0.05$) obtained. Hence the more knowledgeable the mothers are the better the influence they will have on their children's dietary habit.

Hypothesis Two: Dietary habit will not significantly influence the nutritional status of pre-schoolers (1-5 Years Olds) in Ilorin east LGA.

Table 5: Pearson Product Moment Correlation on influence of dietary habits on nutritional status of pre-schoolers.

Variables	r-values	P-value	Decision
Food Responsiveness	0.173*	0.021	Significant
Enjoyment of food	0.130	0.237	Not Significant
Emotion over eating	-0.045	0.684	Not Significant
Desire to drink	0.090	0.149	Not Significant
Satiety Responsiveness	0.018	0.754	Not Significant
Slowness in eating	0.029	0.112	Not Significant
Emotion under eating	0.053	0.801	Not Significant
Food fussiness	0.238*	0.018	Significant

*Correlation is significant at the 0.05 level (2 -tailed)

The result on table 5 shows that there is a significant influence of dietary habits such as food responsiveness ($p < 0.05$) and food fussiness ($p < 0.05$) on the nutritional status (BMI) of the preschool children while enjoyment of food ($p > 0.05$), Emotion over eating ($p > 0.05$), Desire to drink ($p > 0.05$), Satiety Responsiveness ($p > 0.05$), Slowness in eating ($p > 0.05$) and Emotion under eating ($p > 0.05$) are not significant. This implies that children that eats well and show positive attitude to food have the tendency to grow well with good body weight and height.

Discussion of the findings

The main objective of this study was to investigate the influence of dietary habit on nutritional status of Preschool children (1-5 years old). The result of the mean rating in research question one revealed dietary habit of the preschool children which indicated that the children have a good food responsiveness. This implied that the most (76 %) children are interested in and loves food, enjoys eating and is always asking for food. the result also shows that children expressed a strong emotional over eating. This means 69% of the children eats more when annoyed, anxious, worried. This is in dissonance with the finding of Wardle, Guthrie, Sanderson, and Rapoport (2001) who reported that children eat less when emotionally unbalanced. Eto (2014) also agreed to this finding in her study that discovered that consumption frequencies of the various food groups by the children varied. Results also show that the mothers of the preschool children have a good nutritional knowledge and behaviour. The study of Eto (2014) who discovered in her study that majority of the mothers (58.9%) knew what a balanced meal was, and reported that 71.2% of the mothers fed their children for growth and development is in consonant with these findings. which was assessed using WHO (2010) standards. It was revealed that the malnutrition rates for wasting stunting and underweight were low. Moderate and severe wasting, stunting and underweight rates were all below 20% while the children have normal weight for height, normal height for age and normal weight for age of 87%, 85% and 77% respectively. This implies that the children eat well and show positive attitude to food and grow well with good body weight and height. This agree with United Nations Children's Fund (UNICEF) (2016) who discovered in their study on assessment of nutritional status of children under five years of age that the prevalence of malnutrition rates (underweight and wasting) of children included in the study were in

the low category of severity.

The findings of hypothesis one confirmed the relevance of mothers' knowledge and behaviour on children dietary habits as it indicated a significant influence of mothers' knowledge on children's dietary habits. ($p < 0.05$). The findings agreed with Amanuel, Gerez, Hailemariam & Kalayou (2013) who discovered in their study that mothers had a moderate and slight knowledge on infant and young child feeding.

The findings of hypothesis two shows a significant influence of dietary habits such as food responsiveness ($p < 0.05$) and food fussiness ($p < 0.05$) on the nutritional status (BMI) of the preschool children. This implies that children that eats well and show positive attitude to food have the tendency to grow well. This is supported by a similar finding made by Harnack, Stang & Story (1999), who asserted that food responsiveness is an indicator of health index that translates into proper growth in children. The findings also agreed with Eto (2014) who discovered a relationship between feeding practices of the *kayaye* and the nutritional status of their children,

Conclusion

The study concludes that dietary habit of preschool children's influences their nutritional status. The study also concludes that mothers' nutritional knowledge influences the dietary habit of their children. Good education and nutrition awareness are therefore important for care giver and parents to ensure the children eat healthy food and grow well.

Recommendations

Based on the findings of this study the following recommendations were made:

1. If unsure about how to select and prepare a variety of foods for children, mothers should consult a registered dietitian for nutrition counselling to ensure their children eat healthy foods to obtain essential nutrients for proper growth and body functioning.
2. Parents should make sure their children's meals at home are balanced and pack their lunch to include a variety of foods if taken to day care.
3. Women should be encouraged to go to school. Since they are home keepers, education will enlighten them and broaden their knowledge in nutrition.

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