Journal of Agriculture and Agricultural Technology 8(1): 57-61, 2017

NUTRITIONAL STATUS OF PRE-SCHOOL AGED CHILDREN IN SELECTED PRIVATE PRIMARY SCHOOLS IN CHANCHAGA LOCAL GOVERNMENT AREA, NIGER STATE

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ABSTRACT
Prevalence of malnutrition is a serious health problem among children. This study assessed the prevalence of malnutrition among pre-school children in selected private primary schools in Chanchaga Local Government Area Niger state. This study was conducted to ascertain the prevalence of obesity and overweight in 131 pre-school children (1-4 years) using the World Health Organization (WHO) BMI – for – age (z – scores) table. Information on age and gender of the respondents were collected from the school register. Data on height, weight and BMI was obtained using standard techniques. Simple random sampling and systematic random sampling techniques were used to select the schools and the respondents within the selected schools. Data were analyzed using descriptive statistics; While Pearson product moment correlation/ chi-square were used to establish relationship between variables. The prevalence of obesity and overweight was 30.5% and 8.4%, respectively. Males had higher prevalence of overweight (5.3%) compared to females (3.1%), while female had higher prevalence of obesity (16.8%) compared to males (13.7%) respectively. The respondents had higher prevalence of malnutrition of (54.2%) of which male (26.7%) and females (27.5%) which implies that females had higher prevalence of malnutrition than males. There was significant relationship between their BMI and the intake of some of the nutrients. The intake of root & tubers, plant proteins, animal proteins, fat and oil shows significant relationship at p- value ($p<0.05$) while intake of dairy products, snacks and fruits are not significant at p- value ($p>0.05$). The study confirmed the prevalence of malnutrition, obesity and overweight amongst the subjects. Prevention of malnutrition, obesity and overweight requires partnership that involves Government, International agencies, Medical Personnel, Parents, Industries, Consumers and Media in promoting healthy diets and appropriate levels of physical activities.

***Key Words**: Prevalence, BMI, Obesity, Overweight and Malnutrition*

INTRODUCTION
Childhood overweight and obesity is increasingly becoming a global public health concern. In view of this, adequate nutrition which is an important requirement for children, because nutrition transition is believed to be the driving force behind the global obesity epidemic. (Popkin, 2003; FAO, 2004, 2006). Obesity has traditionally being associated with developed countries, but increasingly affecting many low and middle income countries (LMICS), who are least prepared in coping with the consequences (WHO,2010). It is estimated that the number of obese/overweight children aged less than five years of age globally is 42million in 2010, while close to 35million (over 80%) of these live in the developing countries (WHO, 2010).

Children in lower and middle-income countries, especially those growing up in urban environments and following a western lifestyle, are facing a significant and rapidly growing epidemic of childhood obesity (Wang and Lobstein, 2004). The estimated prevalence of childhood overweight and obesity in Africa in 2010 was 8.5% and is expected to reach 12.7% in 2020 (Mercedes *et al.,* 2010). The broad objective was to assess the prevalence of obesity and overweight among pre-school aged children in selected private primary schools in Chanchaga Local Government Area, Niger State, while the specific objectives were to assess the anthropometric indices and dietary intake of respondents.

METHODOLOGY
Study Subjects and Location: Respondents were from eight selected private primary schools in Chanchaga Local Government, Niger State respectively.

Study Design: The study was descriptive and cross sectional covering selected private primary schools in Chanchaga Local Government Niger State.

Sample Size: Three criteria were needed to determine the appropriate sample size. The level of precision, the level of confidence or risk, and the degree of variability in the attributes measured (Glenn, 1992).

$$n = \frac{N}{1 + N(e)^2}$$

n = sample size
N = Total population (210)
e = level of precision at 5%

$$n = \frac{210}{1 + 210(0.05)^2}$$

n = 137

Therefore, the total sample size was 137, however 10% of the total sample size obtained was added to take care of non-response and non-retrieved, but a total of 131participated.

The sample size was proportional to the population density (Gay and Diehl, 1992) of the respondents. Systematic random sampling technique was used to select the respondents

Table 1: Sample size by proportionate allocation

Name of schools	Total population	Sample size
Brighter International	25	18
Himma International	25	18
Redeemer	35	26
Galaxy International	20	14
New Hilton	34	24
Ideal Royal	28	20
Bright Star Academy	20	14
Supreme International	23	16
Total	**210**	**150**

Sampling technique: Simple random sampling and systematic sampling techniques were used to select the schools and respondents within the selected schools.

Methods of data collection: A well-structured questionnaire was administered with the personal data, dietary habit and food intake pattern and anthropometric measurements.

Equipment used for data collection: Anthropometric heightometer was used to measure heights of the subjects in (m^2) and weighing scale was used to measured weight in (kg) and the BMI was calculated to the nearest kg/m^2.

Statistical analysis: Data was analyzed using SPSS, version 20.0. Data generated were analyzed using descriptive statistics (frequency and percentage), while Pearson product moment correlation/ chi-square was used to establish relationship between variables.

RESULTS AND DISCUSSIONS

Table 2 shows gender distribution of the respondents, (58.8%) were males while (41.2%) were females.

Table 2: Gender Distribution of the Respondents

Variables (Sex)	Frequency	Percent (%)
Male	77	58.8
Female	54	41.2
Total	**131**	**100.0**

Table 3 shows age distribution of respondents, (61.1%) were between 1-2 years, while (38.9%) were between 2-3 years and 0% (no respondents were between the age of 3-4 years.

Table 3: Age Distribution of the Respondents (Years)

Variable	Frequency	Percentage (%)
1 – 2	80	61.1
2 – 3	51	38.9
3 – 4	0	0
Total	**131**	**100.0**

Nutrient Intake of the Respondents (Food Frequency): Table 4 shows the food frequency intake of the respondents. More than average (58.0%) of the respondents consumes dairy products on daily basis, 45.8% and 45.8% of the respondents consume cereal products, roots and tubers frequently respectively. More than a quarter (38.2%) and 34.4% of the respondents consumed fats and oil, vegetables and animal proteins respectively, 29.8% and 22.8% of the respondents consumed fruits and snacks respectively while intake of plant proteins is considerably low at (7.6%)

Table 5 shows the relationship between BMI and Nutrient intake of the respondents, which indicates strong association between cereal intake, root and tubers, plant proteins, animal proteins, vegetables and fat and oil which are significant at p- value ($p<0.05$).

Table 6 shows no significant association between BMI and intake of dairy products, snacks and fruits at p- value ($p>0.05$).

Table 4 Nutrient intake of the Respondents (Food Frequency)

Food groups	Everyday	More than once a day	Once a week	Once a month	Rarely	Never
	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)
Cereal products (rice, custard, pap, oat)	60 (45.8)	39 (29.8)	25 (19.1)	_	5 (3.3)	2 (1.5)
Roots and Tubers (yam, cassava, gari, potatoes)	60 (45.8)	14 (10.7)	35 (26.7)	_	15 (11.5)	7 (5.3)
Plant proteins (beans, groundnut, soya beans)	10 (7.6)	5 (3.8)	80 (61.1)	_	15 (11.5)	21 (16.0)
Animal proteins (meat, fish, egg)	50 (38.2)	20 (15.3)	15 (11.5)	_	23 (17.5)	23 (17.5)
Dairy products (milk and milk products)	76 (58.0)	15 (11.4)	5 (3.8)	_	15 (11.5)	20 (15.3)
Snacks (cake, buns, chin-chin, puff-puff)	30 (22.9)	20 (15.3)	14 (10.7)	25 (19.1)	26 (19.8)	16 (12.2)
Vegetables (spinach, pumpkin leaf, waterleaf)	45 (34.4)	30 (22.9)	15 (11.4)	14 (10.7)	17 (13.0)	10 (7.6)
Fruits (orange, pineapple, banana, water melon)	39 (29.8)	37 (28.2)	25 (19.1)	10 (7.6)	20 (15.3)	_
Fat & Oil (palm oil, butter, groundnut oil)	50 (38.2)	35 (26.7)	25 (19.1)	7 (5.3)	14 (10.7)	_

Table 5: Relationship between BMI and Nutrient Intake of the respondents

	Severe Malnutrition	Mild Malnutrition	Normal weight	Over weight	Obesity	p- value
Food Groups	**F (%)**	**F (%)**	**F (%)**	**F (%)**	**F (%)**	
Cereal products (rice, custard, pap, oath)	60 (45.8)	39 (29.8)	25 (19.1)	5 (3.8)	2 (1.5)	0.000*
Root & Tubers (yam, cassava, gari, potatoes)	60 (45.8)	14 (10.7)	35 (26.7)	15 (11.5)	7 (5.3)	0.011*
Plant proteins (beans, groundnut, soybeans)	10 (7.6)	5 (3.8)	80 (61.1)	15 (11.5)	21 (16.0)	0.001*
Animal proteins (meat, fish, egg)	50 (38.2)	20 (15.3)	15 (11.5)	23 (17.5)	23 (17.5)	0.039*
Vegetables (spinach, pumpkin leaf, water leaf)	45 (34.4)	30 (22.9)	14 (10.7)	17 (12.9)	25 (19.1)	0.006*

Significant at $p<0.05$

Table 6: Relationship between BMI and intake of some foods

	Severe malnutrition	Mild malnutrition	Normal weight	Overweight	obese	p-value
Food Groups	**F (%)**	**F (%)**	**F (%)**	**F (%)**	**F (%)**	
Dairy products (milk and milk products)	15(11.5)	15(11.5)	5 (3.8)	20 (15.2)	76 (58.0)	0.151
Snacks (cake, buns, chin-chin, puff-puff)	14(10.7)	23(17.5)	30 (22.9)	28 (21.4)	36 (27.5)	0.211
Fruits (orange, pineapple, banana, water melon)	39(29.8)	37(28.2)	25 (19.1)	10 (7.6)	20 (15.3)	0.144

Not significant at $p>0.05$

Table 7 shows nutritional status of the respondents using their BMI with reference to the World Health Organization (WHO) BMI-for-age (z-scores) table. It shows that 54.2% of the respondents have severe malnutrition, 1.5% have mild malnutrition, 5.3% have normal weight, 8.4% were overweight and 30.5% were obese.

Table 7: BMI Classification of the Respondents

Characteristics (WHO Standard)	Frequency	Percent (%)
Severe malnutrition (below 15th percentile)	71	54.2
Mild malnutrition (15th- 84th percentile)	2	1.5
Normal weight (84th percentile)	7	5.4
Over weight (85th percentile)	11	8.4
Obese (95th percentile)	40	30.5
Total	**131**	**100.0**

Table 8 show that males had higher prevalence of overweight (5.4%) compared to females (3.1%). Females had higher prevalence of obesity (16.8%) compared to males (13.7%)

Table 8: Percentage of Male to Female BMI

Characteristics	F	(%)	F	(%)
	Male		Female	
Obesity	18	3.7	22	16.8
Overweight	7	5.4	4	3.1
Severe malnutrition	35	26.7	36	27.5
Mild malnutrition	2	1.5	0	0
Normal weight	2	1.5	5	3.8
Total	**64**	**48.8**	**67**	**51.2**

DISCUSSION

The age distribution of respondents between the age of 2-3years from the studied areas were 59% boys and 41% girls. However, from the data analyzed, it was observed that weight increases progressively with age likewise their body mass index, which was as a result of their dietary pattern and nutritional intake. There is also a relationship between BMI and Nutrient intake of the respondents.

In this study, the proportion of children who are obese is higher 30.5% as compared to overweight 8.5%. It was observed that higher percentage of the population 54.2% is at severe malnutrition, this was in agreement with (Mercedes and Blossner, 2000) where a national survey conducted showed that 6.7% of preschool children sampled were overweight. The prevalence of childhood overweight and obesity has increased worldwide in recent decades but, the concept "bigger is better" was widely acceptable decades ago this days the perception has drastically changed on the basis of evidence that obesity in childhood is associated with a wide range of serious health complications and an increased risk of premature illness and death later in life (Epstein *et al.*, 2002).

The result analyzed in accordance with that of Keupper – Nybelen *et al.* (2005) shows that these prevalence rates of overweight are lower than rates of malnutrition obtained on children < 5 years from Western countries (USA 35%, overweight, Germany 14.8% overweight, Greek 31.9% overweight, Denmark 10.4% overweight).

Comparing the result of the survey and the result of Harsha *et al.* (2008), using BMI criteria, it was found that (4.47%) children were Overweight (BMI of 85th percentile for the age and sex), (1.41%) children were obese (BMI of 95th percentage for the age and sex) and higher prevalence of severe malnutrition. The present analyses describe levels and trends of overweight and obesity in preschool children using the WHO standards, Obesity and Overweight rates in children has become a matter of growing concern as there is considerable variation in the prevalence of overweight, obesity and wasting between countries. Prevalence of obesity and overweight is of concern because overweight and obese children are likely to stay obese into adulthood and more likely to develop chronic diseases at older age (Ogden *et al.*, 2004). Obesity and overweight is primarily related to dietary intake and physical inactivity of an individual as can be seen from this present study where the BMI of the respondents is significantly associated with some of their nutrients intake. Diet plays a significant role both in development and control of overweight and obesity. For years, doubt has persisted that/ about the contribution of excessive food intake to overweight. Intake of excess dietary fat has been implicated as a major cause of obesity of decades (Lajous *et al.*, 2009).

CONCLUSION

It was observed that there was high prevalence of malnutrition compared to obesity and overweight as shown by the research work. It also revealed that BMI has a significant relationship with the intake of some nutrients of the respondents.

RECOMMENDATIONS

Based on the findings of the research, it is important to recognize that the prevention of obesity and overweight requires a partnership. Governments, International agencies, consumers, Industry, Trade

and the media all play important roles in promoting healthy diets and appropriate levels of physical activity. During infancy and early childhood, preventive measures should focus on the promotion and protection of breastfeeding. Schools should play an important role in teaching healthy eating habits and appropriate exercise regimen. There is a great need for nutrition education on dietary needs, good complimentary feeding practices of pre-school age children for parents and caregivers.

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