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FOREWORD

I warmly welcome all and sundry to the volume 3 issue 1 of Federal Polytechnic – Journal of Pure and Applied Sciences (FEPI-JOPAS) which is a peer reviewed multi-disciplinary accredited Journal of international repute. FEPI-JOPAS publishes full length research work, short communications, critical reviews and other review articles. In this issue, readers will find a diverse group of manuscripts of top-rated relevance in pure and applied science, engineering and built environment. Many of the features that you will see in the Journal are result of highly valuable articles from the authors as well as the collective excellent work of our managing editor, publishing editors, our valuable reviewers and editorial board members.

In this particular issue, you will find that Joseph and Adebanji provided innovative technology on light traffic control system. Ogunkoya and Sholotan engaged standard method for microbiological assessment of shawarma from Igbesa metropolis for possible microbial contamination. Ilelaboye and Kumoye unveiled the effect of inclusion of different nitrogen source on growth performance of mushroom. Ogunyinka et al utilized Fletcher Reeves conjugate gradient method as a robust prediction model for candidates' admission to higher institutions. Omotola and Fatunmbi examined the impact of thermal radiation with convective heating on magnetohydrodynamic (MHD), incompressible and viscous motion of non-Newtonian Casson fluid. Aako and Are meticulously investigated factors affecting mode of delivery using binary dummy dependent models. Abiaziem and Ojelade successfully synthesized biologically active silver nanoparticles using *Terminalia catappa* bark as the eco-friendly source.

In addition, Olowosebioba et al. assessed the rectifying effects of various diodes in power supply units using multisim circuit design software programme. Olujimi et al. successfully accomplished the use of fingerprint based biometric attendance system for eliminating examination malpractices with enhanced notification. Alaba reported the nutritional status assessment of school age children (6-12 years) in private primary school in Ilaro. Muhammed-lawal et. al. assessed the execution and effect of corporate social responsibilities and return to marketing. Awolola and Sanni's research was about achieving quality of engineering education and training in Nigeria using Federal Polytechnic, Ilaro as the case study. Oladejo and Ebisin expatiated on virtual laboratory as an alternative laboratory for science teaching and learning.

Finally, Aneke and Folalu investigated the prospect and problems of the hotels in Ilaro, Ogun State.

I would like to thank and extend my gratitude to my co-editors, editorial board members, reviewers, members of FEPI-JOPAS, especially the Managing Editor, as well as the contributing authors for creating this volume 3 issue 1. The authors are solely responsible for the information, date and authenticity of data provided in their articles submitted for publication in the Federal Polytechnic Ilaro – Journal of Pure and Applied Sciences (FEPI-JOPAS). I am looking forward to receiving your manuscripts for the subsequent publications.

You can visit our website (https://www.fepi-jopas.federalpolyilaro.edu.ng) for more information, or contact us via e-mail us at fepi.jopas@federalpolyilaro.edu.ng.

Thank you and best regards.

E-Signed
Prof. Olayinka O. AJANI

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Assessment of Nutritional Status of School Age Children (5-12 Years) in Selected Private Primary Schools in Ilaro Metropolis Ogun State. Nigeria.

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Abstract

Under nutrition among school age children is a serious public health problem which affects their overall growth and development. Continuous evaluation of the problem will help in reducing it prevalence. This study assessed the nutritional status of school age children (5-12years) in selected private primary schools in Ilaro, Ogun state, Nigeria. A multistage random sampling technique was used in selecting two hundred and fifty (250) respondents using a regular interval from the school register**.** Questionnaire was used to collect data on socio demographic characteristics, anthropometry (Height and Weight) measurement of the respondents were taken using a standard procedure and values obtained was compared with the reference standard and their anthropometric indies were computed using WHO Anthro-plus software. Data obtained on socio demographic characteristics were subjected to descriptive statistics using SPSS v 20.0.Result reveals that majority of the school aged children are male (51.6%), aged between 10-12 years (56.8%) , majority of the school aged children are from Christian background (78%) and Yoruba (86.7%). Under the class variable, half of the pupils (50.4%) were in primary four and from a monogamous home, 44,8% earns between ₦20-₦50 as pocket money. The mean height of the male (2.91) respondent was higher than that of female (1.95) respondent while the mean weight of female (31.22) respondent was higher than that of male (30.51) respondents but the difference was not significance ($P < 0.05$). The nutritional status assessment shows that half of the respondents have normal nutritional status while high prevalence of underweight, stunting and overweight was observed in the rest of the respondents. Conclusively, half of the school age children in private primary school in the Ilaro are suffering from malnutrition.

Keywords: BMI, Nutritional status, Private primary schools, School age children

INTRODUCTION

School age children (SAC) are children between the ages of 5 and 12years, it can be further classified into two groups; primary school-age (9 to 12 years) and secondary school-age (12 to 18years). Thus, school age is a dynamic period of growth and development which is characterized by changes in physical, mental, emotional and social wellbeing (Singh, V., &West, KP. 2004).Good nutrition is crucial in achieving normal growth and development and for maintaining good health throughout life. National Population Commission (NPC) and ICF (2013) When our diet provides the nutrients in incorrect amount either very lesser or in excess of what is needed, it results in an imbalance of nutrient in the body. This condition is responsible for various diseases, slow or no growth of the body and it can lead to death. Young children usually suffer from health problems arising due to inadequate nutrition.

Nutrition is a salient means through which the indicators for good health can be achieved. This is because proper nutrition promotes a good nutritional status thus satisfies the requirement for good physical health. According to Schlenker, E., and Roth, S. L. (2008), for one to have a very good or optimum nutritional status, one must be both food and nutrition secured, however, most people are on borderline nutrition because security is difficult to achieve. Individual's nutritional status depends on the interaction between food that is eaten, the overall state of health and the physical environment.

Gordom, M., and Margret, K., (2002) defines nutritional status as the nutritional health of a person as determined by anthropometric measurements (height, weight, circumferences and so on), biochemical measurement of nutrients or their by- product in blood and urine, a clinical (physical) examination and a dietary analysis.

"Malnutrition is the syndrome of inadequate intake of protein, energy, and micronutrients, which result in poor growth and body size (Schroeder, 2013). There are two forms of malnutrition, under and over nutrition. Under Nutrition: - Is an under-nourishing process in which the normal needs of energy and one/more nutrients are continually not met or lost at a greater rate

than acquired. It is a cumulative process thus making its measurement difficult. In public health, child under-nutrition is usually assessed by anthropometric measurements and it encompasses stunting, underweight and wasting.

Stunting - Failure to reach linear growth potential and is measured as height-for-age at least two standard deviations (SD) below the median of a reference population. It is a good indicator of long-term under nutrition among young children. (WHO, 2006). Wasting is measured as weight-for-height at least 2SD below the median of a reference population. It describes a recent or current severe process leading to significant weight loss; usually a consequence of acute starvation or severe disease. It is commonly used as an indicator of under nutrition among children in emergency situations such as famine, war displacements and natural disasters.

Underweight is measured as weight-for-age at least 2SD below the median of a reference population. It may indicate wasting or stunting, but does not differentiate between them. It is the most commonly assessed of under nutrition in developing countries (WHO, 2006). Obesity is a form of over nutrition; it refers to amassing of excess fat tissue relative to lean body mass. Since measurement of body fatness is difficult and complex, anthropometry is readily used as a proxy for measurement of body fat (WHO, 2006).

Sampling Techniques

A multistage random sampling technique was used in selecting the sample. Ilaro community was purposively selected for the study. The community was divided into three political wards and each ward has an average number of six (6) private primary Schools, two schools was randomly selected without replacement and the respondent were selected systematically from the selected schools using a regular interval from the school register.

SAMPLE SIZE

Gibson 2007 formula was used to calculate the sample size:

$$\text{Size } N = \frac{Z^2 (pq)}{d^2}$$

z= the standard normal variable for 95% confidence level (CI) = 1.96

P= prevalent of attribute (prevalent of under nutrition in Ogun state 17.4% Seribanjo I.O etal., 2011)

Q = 1 – p

D= precisions = 0.05

$$N = \frac{1.96 \times 1.96 \times 0.174 \times 0.826}{0.05 \times 0.05}$$

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Major causes of malnutrition include poverty and hike in food prices, poor dietary practices and lack of agricultural productivity, with many individual cases being a mixture of several factors. This present study assesses the nutritional status of the pupils in private primary school in Ilaro town.

MATERIALS AND METHODS

This study was carried out in six (6) private primary schools in Ilaro town, Ogun state. The materials used for data collection were semi structured and interviewer administered questionnaires, bathroom scale and height-o -meter.

Anthropometric Examination

The following measurements were performed: body weight, height and mid upper arm circumference. Body weight was measured using bathroom scales, with the person wearing light clothes and no shoes. A good quality bathroom scale was used to measure weight, in kilograms. The scale was calibrated before taken the measurement and checked for accuracy, the weights were read at correct eye level. A calibrated wooden carpenter made height o-meter was used with the children standing straight. Eyes looking forward and knees press straight. Using the values obtained in the respondents' height and weight measurement as well as their ages in months, the anthropometric indices was computed using WHO Anthroplus computer software.

Therefore, the total sample size was 221 rounded up to 250 respondents

Data Analysis

Data obtained on socio-economic characteristics were analyzed using statistical package for social science version (spss. v.20.0). Anthropometry measurement was analyzed using World Health Organization (WHO) Anthro-plus software; data obtained was categorized using WHO reference standard.

Ethical Clearance

Permission and consent to use the children for the survey was sought for from the school authority and parent during Parent Teacher Association (PTA) meeting of the schools.

Limitation

This Study was limited to selected government approved private primary schools in the three wards in Ilaro.

RESULT and DISCUSSION

TABLE 1: Socio-Demographic Characteristics of the Respondents

Variables	Categorization	Frequency	Percentage
Sex	Male	129	51.6
	Female	121	48.4
Age (years)	7 – 9	108	43.2
	10 – 12	142	56.8
Class	Primary 4	126	50.4
	Primary 5	46	18.4
	Primary 6	78	31.2
Family structure	Monogamy	193	77.2
	Polygamy	57	22.8
Tribe	Yoruba	214	86
	Ibo	32	13
	Hausa	4	2
Religion	Christianity	194	78
	Islam	56	22
Feeding allowance	₦20 - ₦50	112	44.8
	₦50 - ₦100	70	28.0
	₦100 - ₦150	52	20.8
	No response	16	6.4

Table1 shows that (51.6%) of the respondents were males while (48.4%) were females, with most (56.8%) aged between 10 to 12 years while (43.2%) of the pupils were between the ages of 7to 9 years. Under the class variable, half of the pupils (50.4%) were in Primary four while others are in primary five (18.4%) and primary six (31.%) respectfully. More than half (77.2%) came from monogamous home. The respondents' pocket money was between the ranges of ₦20 - ₦150, with most of the pupils (44.8%) taking between ₦20 - ₦50 as pocket money. between ₦20 - ₦50 as pocket money.

Table 2: Mean and standard deviation of Anthropometry Measurement of the Respondent by gender

ANTHROPOMETRY MEASUREMENT	**GENDER**		**F**	**P-VALUE**
	Male	Female		
Height	2.91±13.17	1.95±6.88	0.510	0.48
Weight	30.51±7.56	31.22±8.01	0.52	0.47
MUAC	24.45±26.67	20.81±5.72	2.15	0.14

Statistically significant at (P < 0.05)

TABLE 3: Nutritional Status of Respondent Weight for Age Z scoreRE

STATUS	Frequency of Male	Percentage of Male	Frequency of female	Percentage of Female
Normal (-1SD≤ Z ≤ +1SD)	75	30	64	25.6
Mild low weight for age (-2SD≤ Z <-1SD)	33	13.2	42	16.8
Moderate low weight for age (-3SD≤ Z ≤ -2SD)	4	1.6	1	0.4
Severe low weight for age (Z< -3SD)	3	1.2	0	0.0
Over weight Z (>3 SD)	14	5.6	14	5.6

TABLE 4: Nutritional Status of Respondent Height for Age Z Score

STATUS	Frequency of Male	Percentage of Male	Frequency of Female	Percentage of Female
Normal (-1SD≤ Z ≤ +1SD)	66	26.4	57	22.8
Mild low Height for age (-2SD≤ Z <-1SD)	44	17.6	41	16.4
Moderate low Height for age (-3SD≤ Z ≤ -2SD)	6	2.4	3	1.2
Severe low Height for age (Z< -3SD)	1	0.4	0	0.0
High Height (Z >3 SD)	12	4.8	20	8.0

TABLE 5: Nutritional Status of Respondent BMI For Age Z Score

STATUS	Frequency of Male	Percentage of Male	Frequency of Female	Percentage of Female
Normal (-1SD≤ Z ≤ +1SD)	66	26.4	74	29.6
Mild low BMI for age (-2SD≤ Z <-	41	16.4	31	12.4

1SD)				
Moderate low BMI for age (-3SD≤ Z ≤ -2SD)	4	1.6	3	1.2
Severe low BMI for age (Z< -3SD)	1	0.4	1	0.4
Over Weight (Z > 3SD)	17	6.8	12	4.8

Table 3 above shows the nutritional status of the respondents. As evident from the table, (30%) male and (25.6%) female have normal weight for age which is (-1SD≤ Z ≤ +1SD) , (13.2%) male and (16.8%) have mildly low weight for age which is (-2SD≤ Z <-1SD), moreover, (1.6%) male and (0.4%) females are moderately underweight for age (-3SD≤ Z ≤ -2SD), furthermore, 1.2% male are severely underweight (Z<-3SD), while (5.6%) male and female are overweight (Z > 3SD) respectively.

Table 4 above shows the Height for Age Z-score of the respondents. It reveals that (26.4%) male and (22.8%) female have normal height for age which is (-1SD≤ Z ≤ +1SD) , (17.6. %) male and (16.4%) female have mild low height for age which is (-2SD≤ Z <-1SD), 2.4% male and 1.2% female have moderately low height for ages (-3SD≤ Z ≤ -2SD) , 0.4%male has severe low height for age(Z<-3SD), while 4.8% male and 8.0% females of the respondent have high height for age (Z>3SD).

Table 5 above shows the Body mass index for Age Z-score of the respondents. It reveals that (26.4%) male and (29.6%) female have normal BMI for age which is (-1SD≤ Z ≤ +1SD) ,(16.4%) male and (12.4%) female have mild low BMI for age (-2SD≤ Z <-1SD), (1.6%) male and (1.2%) female have moderate low BMI for age (-3SD≤ Z ≤ -2SD), furthermore, (0.4%) male and female respectively have severely low BMI for age(Z<-3SD). However, (6.8%) males and (4.8%) females are overweight (Z>3SD).

DISCUSSION

The age range (10-12 years) for majority (56.7%) of the school age children in this study contrasts with an earlier study by Ajuzie, Sanusi, & Makinde (2018). . In that study, 90% of the primary school children were in the age range of 10-12 years. However, the study reported similar result of 2% for Hausa under tribe and varying results for religion, sex and class of school age children respectively. The variation in age range may be due to factors such as differences in the scope, sample size and sampled respondents between the studies. The observed family structure in the present study is also similar with the previous study by Ajuzie, et al., (2018). As more than half of the respondents (77%) came from monogamous family having both parents. The respondents' pocket money was between the ranges of ₦20 - ₦150, with most of the pupils (44.8%) taking between ₦20 - ₦50 as pocket money. This is consistent with the report of Dowler(2001)which states that healthy diet is affected by basic factors such as socioeconomic status. This implies that the school age children cannot purchase a healthy mid day meal with the meager amount they are taking as pocket money.

The Nutritional Status of the school age children reveals that only a quarter of the respondents (30% male and 25.5% female have good nutritional status by having ideal weight for their ages, ideal height for ages (26.4% male and 22.8% females) and ideal BMI for ages (26.4% male and 29.6% female), respectively. This is in agreement with the findings of (Schlenker, *et al.,* 2008 and Gordon, *et al* 2002). The rest of the respondent are undernourished WHO, (2006) wasted, stunted and underweight respectively This study gives credence to an earlier report by Taiwo, *et al.,* (2012). In that study, average school age child in Ibadan, Nigeria is under nourished. According to Schroeder, (2013) and WHO, (2006) wasting is an indicator of present under nutrition, underweight, an indicator of present and past under nutrition, while stunting is failure to reach linear growth potential, which is an indicator of past and long term malnutrition. BMI and height for age are most important measures of growth, development and reflect health condition of individual NPC and ICF (2013). The finding of this present study reveals that the nutritional status of school age children in Ilaro, Ogun state is far below the reference standard of World Health Organization (WHO). This may be due in part to rise in food prices due to recession, poor feeding practices, short fall in intake of nutrient dense foods and low socio economic class of respondents parents. Hence their children are not likely to have access to nutritious foods

CONCLUSION

High prevalence of underweight, stunting and overweight was observed in half of the respondent in the present study. There is need to increase nutritional awareness among parents especially mothers in order to promote good nutritional status in their children. Also, immediate steps should be taken to meet the nutritional needs of children, this can be achieved through school authorities mandating food vendor to provide healthy snacks and nutritious meal in the school premises so that children who eats away from home can have access to good nutrition within the school premises. Lastly, Government should help improve the living standard of citizen by paying minimum wages across board and lift ban on border closures so that the low socio economic class can have food on their table.

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