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PREVALENCE OF OVERWEIGHT/OBESITY AMONGST PRESCHOOL AGED CHILDREN IN AWKA SOUTH LGA, ANAMBRA STATE, NIGERIA.

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ABSTRACT:

The Study was conducted in Awka-South Local Government Area of Anambra State, Nigeria to determine the current prevalence of overweight/obesity amongst preschool aged children using anthropometry. A cross sectional survey research design was used for the study to collect sampled data of 449 children (240 boys and 209 girls) between 0 and 5 years of age. Anthropometric survey data of weight and height were collected using standardized methods. The weight was measured using a calibrated digital bathroom weighing scale while the height was measured using standiometer. Socioeconomic and health related data such as class, age, sex and clinical signs of the children were also collected. From the anthropometric measurements, nutritional indicator (Body-mass-index-for-age) was generated by analysis of the data using WHO Anthro Survey Analyser (Version 3.2.2). The study revealed that 1.6% of the children were overweight. There was no case of obesity amongst the children aged 0-5 years assessed. Overweight children were observed among 12-23 months, 24-35 months, 36-47 months and 48-60 months with prevalence rates of 3.2%, 1.2%, 1.4% and 1.2% respectively. Overweight was more prevalent amongst the boys than girls (1.7% against 1.4%). There seemed to be decreased in the rate of overweight as age increased. It was concluded that the result of this study revealed significant level of overweight (overnutrition) amongst preschool aged children under 5 years in Awka South LGA, Anambra State, Nigeria though the prevalence rate was not high. It was recommended that more interventions should be undertaken by governments and nutrition stakeholders, aimed at reducing childhood overweight/obesity and eradicating the complications associated with overweight and obesity.

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Overweight, obesity, anthropometry, prevalence and malnutrition.

1. INTRODUCTION

Nutrition of preschool children is very essential because the foundation for lifelong health, strength and intellectual capacity is laid during this period. Nutrition is the totality of the processes involved in the ingestion and utilization of food substances by which growth, repair and maintenance of the body are achieved (Kristina, 2022). All deviations from adequate nutrition is called malnutrition (Akubugwo *et al.,* 2014).

Malnutrition could be defined as deficiencies or excesses in nutrient intake, imbalance of essential nutrients or impaired nutrient utilization (World Health Organization, 2022). It still remains a big challenge in developing countries (De Onis *et al.,* 2012). A malnourished child is one who has failed to attain the expected values for any of the nutritional indicators (e.g. weight-for-height, weight-for-age, height-for-age and body-mass-index-for-age) as compared with a healthy child of the same sex and age in the reference population (Akubugwo *et al.,* 2014).

Overnutrition which is one of the types of malnutrition, occurs as a result of excessive intake of nutrients in foods such as protein, carbohydrate or fat over a given period of time leading to malnutrition. Overnutrition usually results in overweight or obesity (Streit, 2018). World Health Organization (WHO) defines overweight as body mass index (BMI) for age z-score between +1 and +2 standard deviation (SD), and obesity as BMI for age z-score greater than (>)+2SD (De Onis *et al.,* 2007). Obesity is linked to chronic diseases, like heart disease, diabetes and certain cancers, knowing this anthropometric measurement can save lives (Tatomir *et al.,* 2022). Childhood obesity can largely affect children physically, socially and emotionally. It is also associated with a lower quality of life which the child experienced (Sahoo *et al.,* 2015).

Lifestyle and diets of children from urban areas make them vulnerable to be overweight compared to children living in deprived rural environments (Rini *et al.,* 2018). Another challenging issues that has to do with overnutrition is poor school performance (Heshmat *et al.,* 2014). A study in Africa and other developing countries has revealed an emerging trend of malnutrition with overweight and obesity increasing at a frightening rate in comparison to undernutrition (wasting, underweight and stunting) (Ajayi *et al.,* 2015). This shift is as a result of increased consumption of high-calorie foods and less tedious jobs resulting in many individuals having a positive energy balance and thus becoming overweight or obese (Lozano *et al.,* 2018). Generally, overnutrition may be habits (over eating), health conditions, taking too many unprescribed dietary supplements, lack of physical activity (sedatary lifestyle), psychological

factors (stress), medication, genetic factors and environmental factors (unsafe foods, e.g. heavy metals in food).

This study was done with the objective to determine the prevalence of overweight/obesity amongst preschool aged children 0-5 years in Awka-South LGA, Anambra State, Nigeria using WHO (2006) standard and z-score. This work is important for evaluation of performance of impacts of set nutritional intervention goals.

2. METHODS AND MATERIALS

2.1 Study Design

The study was a descriptive cross sectional study, involving preschool aged children (0-5 years) in public primary schools in Awka-South LGA, Anambra State, Nigeria.

2.2 Study Area

The study area is Awka South Local Government Area (LGA) of Anambra State, Nigeria which counts as one of the 21 existing LGAs of the State. Awka South is located at latitude's $6^{o}20^{1}$N and $6^{o}33^{1}$N and longitude $7^{o}00^{1}$E and $7^{o}15^{1}$E and is situated in the South-East geopolitical zone of Nigeria (Okafor *et al.,* 2023). Awka South LGA is made up of nine towns, namely, Amawbia, Awka, Ezinato, Isiagu, Mbaukwu, Nibo, Nise, Okpuno and Umuawulu. Awka South LGA has a population of 189,654 (one hundred and eighty-nine thousand, six hundred and fifty four) according to the 2006 national population census figures (NPC, 2006). There are 45 registered public primary schools in Awka South LGA, Anambra State.

2.3 Selection of Samples

The study population included preschool aged children 0-5 years in Awka South LGA. Data collection was carried out at the primary school level. 15 primary schools were randomly selected out of 45 primary schools with at least one primary school per a town in nine towns that make up Awka South LGA. 30 preschool children were selected from each of the 15 randomly selected primary schools in Awka South LGA. The total number of samples was 450 children. Preschool children 0 to 5 years old and free from skeletal deformities, medical disorder such as kidney diseases, diabetes mellitus, asthma were considered for this study. Children above 5 years old and those whose age could not be ascertained were excluded from this study.

2.4 Data Collection

A structured questionnaire was designed which includes socioeconomic and health related questions (such as class, age, sex, occupation of parents and clinical signs) and anthropometric measurements of weight and height.

2.5 Anthropometric Measurements

Anthropometric measurements of weight and height of all selected preschool children were taken. Their weights were measured using a calibrated standardized digital bathroom weighing scale with the accuracy of the scale to the nearest 0.1kg. The children were asked to stand straight in the middle of the scale's platform without shoes, without touching anything and the eyes were looking at the horizontal line. The weight was recorded twice and the average value used in the analysis. The scale was set to zero point before each use.

Their heights were also measured with standiometer placed on a flat surface. The children were asked to stand straight and look straight in a horizontal plane with feet together, without shoes. The top of the standiometer (movable head piece) was lowered to the top of the head. Their heights were recorded to the nearest 0.5cm. Two measurements were taken and the average value was obtained (WHO Physical Status, 1995).

2.6 Statistical Analysis

The anthropometric data were analysed using WHO Anthro Survey Analyser (Version 3.2.2) to obtain WHO (2006) normalized reference table of body-mass-index-for-age and mean z-scores (WHO Anthro Survey Analyser, 2019). These tables were used to determine the prevalence of overweight/obesity based on the cut-offs for overweight and obesity. Mean z-scores and standard deviations of the parameters were used to summarize the data for each age group.

3. RESULTS

Table 1: Prevalence of Overweight/Obesity (BMI-for-age) between both sexes within the age groups in a sample of 449 preschool aged children from Awka-South LGA.

Age Groups (Months)	Sex	Number	% Z<+2 SD	% Z<+3 SD	Mean Z-score	SD
0-5	Boys	0	-	-	-	-
	Girls	0	-	-	-	-
	Combined	0	-	-	-	-
6-11	Boys	0	-	-	-	-
	Girls	0	-	-	-	-
	Combined	0	-	-	-	-

12-23	Boys	32	3.1	0	-1.01	1.09
	Girls	31	3.2	0	-0.75	0.84
	Combined	63	3.2	0	-0.88	0.98
24-35	Boys	44	0	0	-0.96	0.74
	Girls	39	2.6	0	-0.78	1.23
	Combined	83	1.2	0	-0.87	1.00
36-47	Boys	78	1.3	0	-0.63	1.04
	Girls	63	1.6	0	-0.86	0.95
	Combined	141	1.4	0	-0.73	1.00
48-60	Boys	86	2.3	0	-0.68	1.08
	Girls	76	0	0	-0.63	0.96
	Combined	162	1.2	0	-0.66	1.02
0-60 (Total)	Boys	240	1.7	0	-0.76	1.02
	Girls	209	1.4	0	-0.74	0.99
	Combined	449	1.6	0	-0.75	1.00

From the above result (table 1), No case of obesity was observed amongst the children aged 0-5 years assessed. Overweight children were noticed among 12-23 months, 24-35 months, 36-47 months and 48-60 months old with prevalence rates of 3.2%, 1.2%, 1.4% and 1.2% respectively. There seemed to be decreased in the rate of overweight as age increased. Overweight was higher amongst boys (1.7%) than girls (1.4%). Total prevalence rate of overweight in the entire population was 1.6%.

Table 2: Prevalence of Overweight/Obesity (BMI-for-age) amongst 240 preschool aged male children 0-5 years from Awka-South LGA.

Age Groups (Months)	Number	% Z<-3 SD	% Z<-2 SD	% Z<+1 SD	% Z<+2 SD	% Z<+3 SD	Mean Z-score	SD
(0-5)	0	-	-	-	-	-	-	-
(6-11)	0	-	-	-	-	-	-	-
(12-23)	32	0	18.8	3.1	3.1	0	-1.01	1.09
(24-35)	44	0	4.5	2.3	0	0	-0.96	0.74
(36-47)	78	0	10.4	2.6	1.3	0	-0.63	1.04
(48-60)	86	3.5	9.3	5.8	2.3	0	-0.68	1.08
Total (0-60)	240	1.3	10	3.8	1.7	0	-0.76	1.02

From the above result (table 2), there was no case of obesity i.e. no male children was obese. But there was incidence of overweight. Overweight was more prevalent among male children 12-23 months with prevalence rate of 3.1%. The total prevalence rate of overweight for male children was 1.7%.

Table 3: Prevalence of Overweight/Obesity (BMI-for-age) amongst 209 preschool aged female children 0-5 years from Awka-South LGA.

Age Groups (Months)	Number	% Z<-3 SD	% Z<-2 SD	% Z<+1 SD	% Z<+2 SD	% Z<+3 SD	Mean Z-score	SD
(0-5)	0	-	-	-	-	-	-	-
(6-11)	0	-	-	-	-	-	-	-
(12-23)	31	0	3.2	3.2	3.2	0	-0.75	0.84
(24-35)	39	0	20.5	5.1	2.6	0	-0.78	1.23
(36-47)	63	0	11.5	1.6	1.6	0	-0.86	0.95
(48-60)	76	1.3	6.6	5.3	0	0	-0.63	0.96
Total (0-60)	209	0.5	10	3.8	1.4	0	-0.74	0.99

From the above (table 3), female children 0-5 years were not obese. Female children 4-5 years (48-60 months) were not overweight, the rest were overweight with prevalence rates of (3.2%, 2.6% and 1.6%). Overweight was more prevalent among preschool female children 12-23 months of age (3.2%). The total prevalence rate for female population was 1.4%.

Table 4: Comparison of the Prevalence of Overweight/Obesity (BMI-for-age) between preschool aged children (0-5 years) in Urban and Rural communities in Awka-South LGA.

Cluster	Number	% Z<-3 SD	% Z<-2 SD	% Z<+1 SD	% Z<+2 SD	% Z<+3 SD	Mean Z-score	SD
Urban	239	0.4	10.9	4.2	0.8	0	-0.82	0.94
Rural	209	1.4	9.1	2.9	1.9	0	-0.69	1.06
Total	448	0.9	10.1	3.6	1.3	0	-0.76	1

The result above indicated more prevalence of overweight amongst children in rural communities (1.9%) compared with children in urban communities (0.8%) in Awka South LGA.

Figure 1 depicts the comparison of the prevalence of Overweight/Obesity (BMI-for-age) between preschool aged children (0-5 years) in Urban and Rural communities in Awka-South LGA.

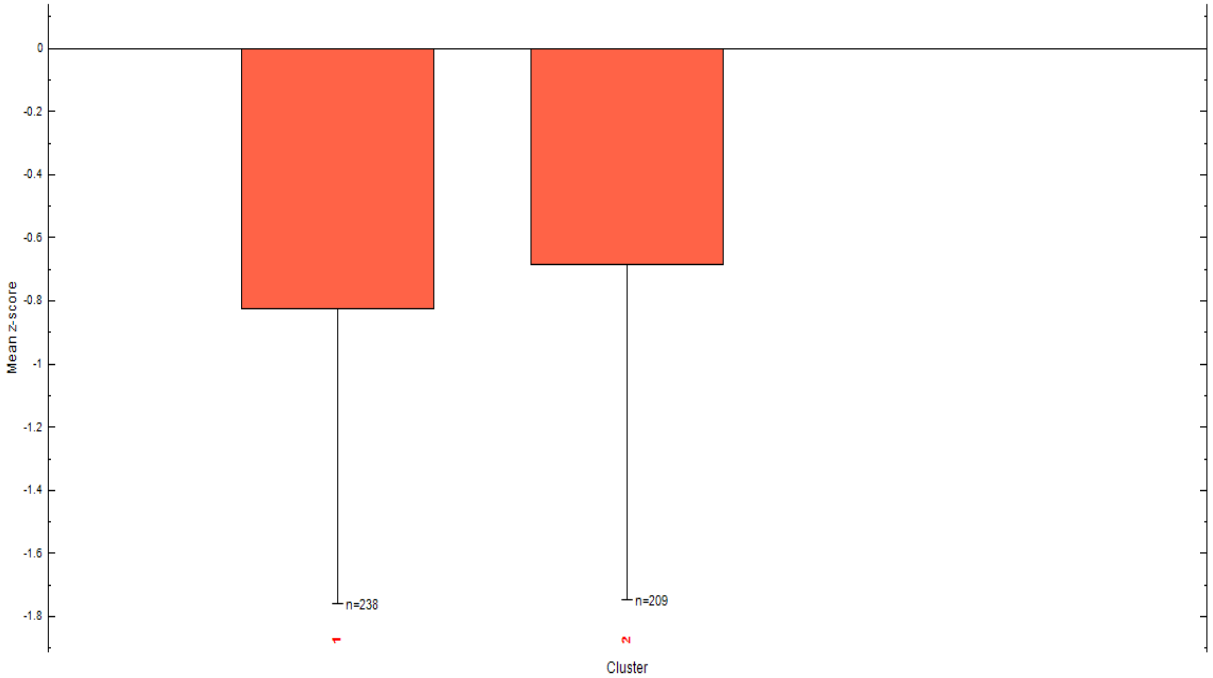

Figure 1: A graph of mean Z-score (BAZ) for preschool aged children (0-5 years) in Urban and Rural areas of Awka-South LGA.

The mean Z-score (BAZ) values in table 4 and figure 1 were -0.82 for urban areas and -0.69 for rural areas with total mean z-score (BAZ) as -0.76. The value for the rural area was greater than that of the total cluster which indicated that overweight was more prevalent in the rural areas of Awka-South LGA than in the urban areas.

4. DISCUSSION

In this study, a total of 1.6% out of the 449 preschool aged children 0-5 years included in the study were found to be overweight. There was no case of obesity in the population studied. Overweight children were observed among 12-23 months, 24-35 months, 36-47 months and 48-60 months old with prevalence rates of 3.2%, 1.2%, 1.4% and 1.2% respectively.

From the result in table 1, there seemed to be decreased in the rate of overweight as age increased. Overweight was more prevalent amongst boys (1.7%) than girls (1.4%). The reason for this is that following birth, girls generally have greater fat mass and less fat-free mass, which is in turn associated with less energy intake and lower calorie needs for girls than boys. Sex

steroid hormones are associated with differences in body composition in children and youth (Shah *el al.,* 2020).

Table 4 and figure 1, compares the prevalence of overweight across clusters (urban and rural areas) with mean z-scores of -0.82 for urban and -0.69 for rural areas of Awka South LGA. The implication of this is that overweight was more prevalent in the rural areas than in the urban areas because rural areas had greater mean z-score value than the total mean z-score. Many factors may be responsible for the more overweight children in rural areas (1.9%) than in urban areas (0.8%) in Awka-South LGA, which include higher calorie consumption, availability and affordability of healthy food options from major occupation of rural dwellers (farming), lack of nutrition education and services, limited access to overweight/obesity prevention programs and weight management services, influence of poverty, scarcity of parks, recreational areas, sidewalks, bike trails and exercise facilities that promote physical activity (National Advisory Committee on Rural Health and Human Services, NACRHHS Report, 2011).

However the result of this study (1.6%) is encouraging when compared with the result of previous study by Ajayi *et al.,* (2015) on prevalence of overweight/obesity among primary school pupils in Ikeja LGA of Lagos State which was 17.4%

5. CONCLUSION

The results of this study revealed significant level of overweight amongst preschool aged children under 5 years in Awka South LGA, Anambra State, Nigeria though the prevalence rate was not high. More interventions in form of daily school meal, nutritional education, campaigns on importance of healthy eating and compulsory physical activity in all schools should be undertaken by governments and stakeholders aimed at reducing childhood overweight/obesity and removing the complications associated with overweight and obesity in the population.

6. CONTRIBUTION TO KNOWLEDGE

This research has provided the current prevalence rates of overweight/obesity in Awka South LGA, Anambra State. It has also provided base line data to monitor overweight and obesity in order to prevent their consequences or complications of chronic diseases in the population.

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