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Nutritional status of day care attendees in Port Harcourt metropolis

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Abstract: *Objective:* To determine the nutritional status of children aged 0-35 months attending day care centres in Port Harcourt metropolis.
Methodology: A cross-sectional descriptive survey approved by the University of Port Harcourt Research Ethics Committee, the parents, Authorities of Day care centres and National Association of Proprietors of Private Schools, was carried out between November 2011 and July 2012 in 200 day care centres in Port Harcourt metropolis. The centres were selected using stratified multistage random sampling technique. At each day care 10 children (5 males and 5 females) selected randomly from those who met the inclusion criteria were recruited. With parental cooperation, each child's socio-demographic data, nutritional history and anthropometric measurements were obtained. Data were analysed using SPSS version 20. Statistical significance was set at $p<0.05$.
Results: Complete data for analysis were available for 1541 children aged 5-34months (mean 23.78 ± 7.04 months, median 25 months and modal 24 months) with 110(7.2%) children aged less than 12 months and 283(18%) less than 18 months. They consisted of 766 (49.7%) males and 775 (50.3%) females. Most children had normal nutritional status using the various indices but 46 (3%) children were underweight, 85 (5.5%) stunted, 109 (7.1%) wasted and 328 (21.3%) overweight. The mean Mid Upper Arm Circumference (MUAC) was 15.95 ± 1.698 cm with29 (2%) children having MUAC below 115mm.
Conclusion: Majority of the day care attendees were well nourished. However, the high prevalence of overweight malnutrition is of serious concern in view of its associated long term morbidity and the need for effective interventions to reduce this risk.

Key Words: day care centres, under-fives, malnutrition, overweight, children.

Introduction

Malnutrition, as defined by the World Health Organization (WHO), is a cellular imbalance between the supply of nutrients and energy and the body's demand for them to ensure growth, maintenance and specific functions. In childhood, malnutrition is an underlying factor in more than half of under-five deaths worldwide and is the most important risk factor for illness and death in children worldwide[1].

A child's nutritional status is an indicator of his/her general wellbeing and health. Influenced by food intake and the quantity and quality of foods ingested and the child's physical health, it affects all aspects of the child's health i.e. growth and development, physical activity and response to serious illness. The spectrum of nutritional status spans from severe malnutrition to normal nutritional status to obesity. Anthropometry[2], the commonest method of nutritional status assessment in under-fives, involves the measurement of the length/height, weight and mid (upper) arm circumference of a child. These are compared with accepted national and international standards of their expression to determine a child's status. The z-score charts which were developed by the WHO using children from different countries are the most widely used in the assessment of a child's nutritional status[2,3].

Although there is a dearth of literature on the nutritional status of day care attendees in Nigeria, some available reports have linked day care attendance with poor nutritional status such as underweight malnutrition or obesity (over-nourished)[4-9]. An Ibadan-basedstudy[6] showed that day care attendees were more likely to be moderately underweight and wasted than those cared for at home because they were breastfed less while in day care centres. On the other hand, in Irewole[7], Osun State, female

day care attendees were shown to be more wasted, stunted or underweight than the males. In view of increasing urbanisation, promotion of early child learning and patronage of day care centres and the impact of malnutrition on under-five morbidity and mortality in Nigeria, it is important to determine the nutritional status of day care attendees and its determinants so as to guide policy makers in adopting practices that will promote optimal growth and development of under-fives. This study was therefore conducted to determine the nutritional status of children attending day care centres in Port Harcourt metropolis so as to provide information that will inform policies on child health, development and education in the State.

Materials and Methods

This cross-sectional descriptive survey was carried out in Port Harcourt, the capital of Rivers State located in the South-South geopolitical zone of Nigeria, from November 2011 to July 2012. By legislation, Day Care Centres in Rivers State are expected to be registered with the Department of Child Care in the State Ministry of Social Rehabilitation as well as with the National Association of Proprietors of Private Schools (NAPPS). However less than 10% of the 500 centres registered with NAPPS were registered by the State government. These centres were spread across the metropolis and clustered in the 20 zones- 10 zones in each of the 2 Local Government Areas (LGA) that made up Port Harcourt metropolis-Obio/Akpor and Port Harcourt LGAs. Sadly the Rivers State Government did not run any day care centre.

With the assistance of the NAPPS, 200 schools were selected using a stratified multistage random sampling technique, based on the location of the school. In each LGA, 5 out of 10 zones were selected and 20 schools from each of the 5 selected zones. At each school 10 children -5 from each gender- aged between 0-35 months who had been attending the day care centre for at least 3 months were recruited with the consent of their parents. Socio-demographic data and anthropometric measures – weight, length/height, mid upper arm circumference- were obtained from the children using a pre-tested questionnaire approved for the study by the Research Ethics Committee of the University of Port Harcourt Teaching Hospital and the West African College of Physicians. Additionally, NAPPS Port Harcourt Chapter, Proprietors of each day care centre and Parents of children recruited approved the study. Standards methods and equipment were used for anthropometric measurements. The anthropometric indicators used were the weight-for-age z-score, the length/height-for-age z-score and the weight-for-length/height z-score. The WHO's z-scores for various nutritional indices were calculated and the WHO definitions of various forms of malnutrition were adopted for this study. Data were obtained by one of the researchers with the assistance of trained field workers. Data handling, analyses and write up were done by the authors. The raw data were vetted and entered into a Microsoft Excel spreadsheet and analysed using SPSS 20. A p value < 0.05 was considered statistically significant.

Results

The 1541children with complete data comprised of 766 (49.7%) males and 775 (50.3%) females. They were aged 5 to 34 months (mean 23.78 ± 7.04 months, median - 25 months and mode- 24 months with 110(7.2%) children aged less than 12 months and 283(18%) less than 18 months (Fig. 1).The weights of the children ranged from 5.90 – 21kg (mean 13.69 ± 2.82 kg; median-14kg). Although 27 (58.7%) of the 46(3%) underweight children were aged 24-35 months, underweight malnutrition was not statistically significantly associated with the ages of the children (p = 0.226) (Table 1).

Fig 1: Age Distribution of the 1541 day care attendees studied

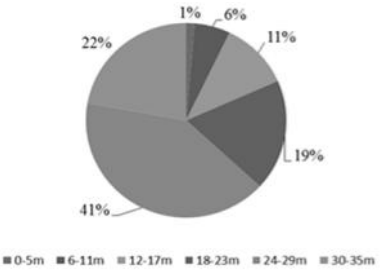

Table 1: Age distribution of the mean weight and weight forage z scores of the day care attendees

		WAZ scores		
		Underweight < -2 SD	Normal weight ≥ -2 SD	Total
Age range (months)	Mean weight (kg)± SD	N (%)	N (%)	N (%)
0-5	7.25 ± 0.80	0 (0.0)	21 (1.4)	21 (1.4)
6-11	10.27 ± 2.90	4 (0.3)	85 (5.5)	89 (5.8)
12-17	11.74 ± 2.40	7 (0.5)	166 (10.8)	173 (11.2)
18-23	13.42 ± 2.31	8 (0.5)	277 (18.0)	285 (18.5)
24-29	14.43 ± 2.29	12 (0.8)	619 (40.2)	631 (40.9)
30-35	14.85 ± 2.58	15 (1.0)	327 (21.2)	342 (22.2)
Total (%)	13.69 ± 2.82	46 (3.0)	1495 (97.0)	1541 (100)

The children's supine lengths/heights ranged from 56.90 – 112.0 cm (mean 89.54 ± 8.60 cm, median 90.80 cm). Of the 85 (5.5%) stunted children, 45 (52.9%) were aged 24-35 months with a modal age of 24-29 months. The differences in the age distribution of stunting was statistically significant (p = 0.005) (Table 2).

Table 2: Age distribution of the mean length/height and height-for-age z scores of the day care attendees

		HAZ score		
	Mean length/ height (cm) ± SD	Normal	Stunted	Total
Age range (months)		(≥ -2 S.D) N (%)	(<-2 S.D) N (%)	N (%)
0-5	65.25 ± 4.21	21 (1.4)	0 (0.0)	21 (1.4)
6-11	76.13± 10.92	77 (5.0)	12(0.8)	89 (5.8)
12-17	82.26 ± 6.37	158 (10.3)	15 (1.0)	173 (11.2)
18-23	88.03± 6.47	272 (17.7)	13 (0.8)	285 (18.5)
24-29	92.10 ± 5.78	604 (39.2)	27 (1.8)	631 (40.9)
30-35	94.75 ± 5.76	324 (21.0)	18 (1.2)	342 (22.2)
Total (%)	89.54 ± 8.60	1456 (94.5)	85 (5.5)	1541 (100)

$\chi^2 = 17.762$, df = 5, p = 0.005

Three hundred and twenty eight (21.3%)children were overweight and 109 (7.1%) were wasted with children in the age group 24-29 months being more affected by these forms of malnutrition. The weight-for-height/ length z scores (Table 3) were statistically significantly different between the age groups (p = 0.049).

Table 3: Age distribution of weight-for-height/length z- scores of the day care attendees

	WHZ (SD)			
	Wasting	Normal	Overweight	Total
Age group (months)	< -2 N (%)	-2 to ≤+2 N (%)	>+2 N (%)	N (%)
0-5	1(0.1)	13 (0.8)	7 (0.5)	21 (1.4)
6-11	6 (0.4)	63 (4.1)	20 (1.3)	89 (5.8)
12-17	21 (1.4)	113 (7.3)	39 (2.5)	173 (11.2)
18-23	18 (1.2)	198 (12.8)	69 (4.5)	285 (18.5)
24-29	32 (2.1)	470 (30.5)	129 (8.4)	631 (40.9)
30-35	31 (2.0)	247 (16.0)	64 (4.2)	342 (22.2)
Total (%)	109(7.1)	1104 (71.6)	328 (21.3)	1541(100)

$\chi^2 = 18.377$, df = 10, p = 0.049

Discussion

The 97% children with normal weight-for-age z scores obtained in the present study was higher than the national average of 71%[10]. The prevalence of underweight malnutrition found in this study compared to that found at Ikire but was lower than was reported among day care attendees in Ibadan and preschool children in Ethiopia, Nigeria (Kano and Kaduna) and Western Kenya[7,11-13]. The similarities in prevalence rates in this study and that in Ikire may be due to the large sample sizes studied. However, the five- fold prevalence rate reported in Ibadan[6] compared to the current rate may be consequent on the inclusion of ill children in the Ibadan study contrary to the situation in this series.

The 5.5% prevalence of stunting rate in the present study is lower than the 37% national average in the Nigerian 2013 National Demographic and Health Survey (NDHS)[10]. It may be due to the fact that this study was done in an urban population. However, it compared favourably with those reported among day care attendees in Iran, Osun State and Egypt[7,8,14] which reported a stunting prevalence rate of less than 10%. These findings are significant given the high prevalence of stunting that had been previously reported in these areas[15]. Similarly, the lower (7.1%)wasting prevalence in this study compared to the 12.1% reported at Ibadan[6] may be attributable to the fact that the subjects in the Ibadan study were residents of a middle-high density area where persons in the lower social classes resided. This contrasts with the subjects of this study who belonged mostly to the high-middle social classes who would be able to pay the high fees for day care attendance. However, the current prevalence of wasting was similar to that reported amongst day care attendees in Iran[8]. As reported by Amosu *et al*[7], the prevalence of wasting in this study was higher among females.

The high prevalence of overweight malnutrition found in this study is of public health significance and further buttresses the fact that overweight malnutrition is becoming an increasing problem in developing nations like Nigeria[16]. This can be deduced from the fact that previous Nigerian studies did not document overweight malnutrition in under-fives[6,7] until the recent NDHS 2013[10]did so. However, our prevalence rate was five times that reported in the NDHS 2013[10]and may be attributed to the higher socioeconomic class of the study subjects and poor awareness of parents[17]. Our prevalence rate was comparable to that reported in Brazil[18] where the overweight prevalence was below 10%.However, in the Amazon region of Brazil[19], children attending private day care centres were found to be more overweight and obese compared with those at public day care centres.

An Ibadan-basedstudy[6] which compared the nutritional status of day care attendees and those cared for at home showed that day care attendees were more likely to be moderately underweight and wasted. This was attributed to the day care attendees being breastfed less than the children who stayed at home. Another study in Irewole[7] Local Government Area of Osun State among children aged 2 years and younger attending day care centres showed no statistically significant gender differences in their nutritional status with the prevalence rates of underweight malnutrition, stunting and wasting being not more than 5% in both sexes but more females than males were wasted, stunted or underweight. These figures were lower than those reported among children in day care centres in Rasht, northern Iran[8] where 8.6% were stunted, 8% wasted and 7.1% underweight. On the contrary, among children at a day care centre in Sao Paulo[9] the initial prevalence rates for the different nutritional status were 10.1% for wasting, 29.8% underweight and 50% stunting.

Conclusion

Most day care attendees were either well-nourished or overweight. The high prevalence of overweight malnutrition is of national health significance and requires an evaluation of the feeding practices and exercise regimens in the day care centres in order to adopt measures to reduce the associated burden of non- communicable diseases due to this form of malnutrition. It also calls for awareness programmes and policies on food processing and vending in schools and elsewhere.

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