



## Health status of children aged under two years cared for in day-care centres and the home environment in Ibadan, Nigeria

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### Abstract

#### KEY WORDS:

Day-care

Home environment

Health status  
Immunisation status

Morbidity pattern

Under two-year old  
child.

**Background:** As a result of the increasing numbers of Nigerian women in the labour force and also the gradual disintegration of the extended family system, a demand for alternative means of caring for children is being created. Day-care as an alternative source of childcare has now become a necessity rather than an option.

**Objectives:** To assess and compare the health status of two groups of children under two years old cared for in two different rearing environments, home environment and day-care centres.

**Methods:** A descriptive comparative study design was used. Two groups of children from comparable low socio-economic backgrounds were recruited into the study. Using simple random sampling, 91 under two-year old children attending day-care centres in a middle-high density area of Ibadan and 91 under two-year old children cared for in the home environment in a settlement in the junior staff quarters of the University of Ibadan were enrolled in the study. Anthropometric data, immunisation status and morbidity patterns for various childhood illnesses were obtained for children in both groups in the study.

**Results:** Statistically insignificant higher percentages of children cared for in the day-care centres were underweight and wasted, while significantly more children cared for at home were stunted {Relative risk RR=1.46, (95% Confidence Limit CL = 1.10-1.93), p=0.018}. Except for measles immunisation coverage which was lower in the day-care group, there was comparability in the immunisation status of children in both groups. Day-care attendance was found to be a significant risk factor associated with the occurrence of diarrhoea (RR=1.74, (95% CL =1.34-2.26), p=0.0016) and upper respiratory tract infections (RR=2.31, (95% CL = 1.62-3.30), p=0.000004) in these children. Measles occurred only in children attending day-care centres and there was an outbreak during the study period.

**Conclusions:** Given the higher risk of infections among children cared for in day-care centres, strategies should be put in place to train the child minders and ensure regular supervision of the

### Introduction

Escalating cost of living is compelling mothers to take up jobs outside their homes to supplement family income.<sup>1,2</sup> In Africa, 80% of women are actively engaged in economic activities outside their homes.<sup>2,3</sup> In Nigeria, demographic, social and economic factors such as population growth and shifts, changes in composition of the labor force due to improved opportunities in female education and westernization, the shift from agriculture to industrial employment, migration from rural to urban areas and changes in patterns of family life have all affected the way people live.<sup>4</sup> These changes, while increasing the female labor force, have also been associated with a gradual disintegration of the extended family system and thus a decrease in the traditional sources of child-care.<sup>5</sup> Consequently, there is a greater demand for alternative

means of caring for children. Day-care as an alternative source of childcare has become a necessity rather than an option.

While child day-care setting is supported to provide opportunities for ensuring healthy children, enhanced development, good nutrition, vaccination coverage and health promotion activities<sup>6,7</sup> research findings however show that pre-school children who spend more time in structured day-care settings, have higher risk for infection than their counterparts who do not.<sup>8,9,10</sup>

A forum organized for proprietors of day-care centres in Nigeria, while reviewing their performance, expressed fears about the rise in the number of these centres without

much attention being paid to quality.<sup>4,11</sup> Information on how well they are meeting the needs of these children is grossly inadequate. The present study was carried out to compare the health status of children under- two years old cared for in day-care centres and in home environment. This information is urgently needed to fill the gap in knowledge of the medicals status of children in day-care centres, on this important and widely utilized alternative source of childcare in Nigeria and help inform policy formulation.

## Materials and methods

### Study area

The study was carried out in Ibadan, Nigeria. With a present population well over 4 million,<sup>12</sup> the city of Ibadan can be divided into three zones, a traditional inner core, a transitional area and a sub-urban periphery.<sup>13</sup> Traditional inner core area is characterized by people of low socio-economic status whose occupations are mainly petty trading and subsistence farming. The transitional zone, an interface between the inner core and periphery consists of both indigenous and non-indigenous people who are mostly Yoruba in ethnic origin. They are civil servants or are engaged in trading and classified as being of middle socio-economic status. The low-density periphery consists of people from diverse ethnic origins but mostly Yoruba. People in this area are professionals, businessmen, highly qualified academicians, top civil servants, and classified as having high socio-economic status.<sup>13</sup>

### Study design

The study was descriptive, prospective and comparative in design. It considered two groups of children from comparable low-middle socio-economic backgrounds. One group consisted of children who had been attending day-care centres in Agbowo, a transitional high-density area of Ibadan. Only those who were known to have been in day-care for at least three months were included in the study. They were compared with children selected from Agbowo community and Abadina, a University settlement for the junior and intermediate level employees of the University of Ibadan located across the road from Agbowo. These children were those cared for by their mothers since birth and subsequently reared within their home environment.

Using simple random sampling, half of a total of 16 day-care centres in Agbowo community were selected and all the 91 children under two years of age in the sampled day-care centres were enrolled in the study. Because of the relatively small number of children aged less than two years cared for at home in Abadina, all the 38 children found within the 0-2 years age group there were included in the study. Fifty-three under two-year old children cared for in their home environment in Agbowo community were also recruited into the study.

Relevant data were collected from parents of children in both groups, from the proprietors and the attendants of the day-care centres utilizing a pre-tested and structured questionnaire. Information sought included age and sex of

school institution, characteristics of attendants, child's immunisation status, anthropometric measurements, and child-staff ratio.

The weight and length of the children in both groups were determined at the beginning of the study and were subsequently monitored every two months over a 6-month period. Each child was weighed without clothes on using the Salter weighing scale. Using the National Centre for Health Statistics (NCHS) median values as standard, all children with weight-for-age, length-for-age, weight-for-length that fell below 2 standard deviations ( $<2SD$ ) or below 3 standard deviations ( $<3SD$ ) of median value at the end of the study were classified as moderately or severely underweight, stunted and wasted, respectively.<sup>14</sup> All illnesses that occurred during the study period were recorded. This was done by means of distributing calendars to both the parents of children in the home environments and the attendants in the day-care for recording of occurrence of any illness during the study period and these were checked and collated fortnightly. Informed consent was obtained from parents and child minders.

Data were entered and analysed using EPI INFO 6 Statistical software computer programme. The results were subjected to appropriate statistical analysis.

## Results

The age-sex distribution of the children in both study groups is shown in Table 1. There were 46 males and 45 females attending day-care centres while 58 males and 33 females were cared for at home. Overall, 182 children were examined, 91 attending day-care centres and 91 cared for at home. Their ages ranged from 0-23 months.

### Anthropometric data

More children attending day-care centres compared with those cared for at home were wasted 11(12.1%) versus 5 (5.5%) though this difference was not statistically significant {Relative risk (RR) =1.43, {95% Confidence Interval (CI) =0.99-2.06},  $p=0.19$ }. In contrast, more children cared for at home 38 (42.1%) compared with 22 (24.2%) attending day-care centres were stunted {RR=1.46, ( 95 CI =1.10-1.93),  $p=0.018$ }. Stunting was more commonly observed among males than females in both locations though this difference was not statistically significant ( $p>0.05$ ). Furthermore, 14.3 and 2.2% of children attending day-care centres were moderately and severely underweight while 13.2 and 5.3% children cared for at home were in the same categories respectively. The difference was not statistically significant ( $X^2=0.05$ ,  $p=0.82$ ; Fishers Exact  $p=0.44$  respectively).

### Immunisation status

A similar percentages of children attending day-care centres (87.9%) and those cared for at home (86.8%) were up-to-date on immunisation ( $p>0.05$ ). Of the 80 children between the ages of 9 and 24 months, 69 (86.3%) attending day-care and 48 out of 50 (96.0%) of the children cared for at home had received one dose of measles

immunisation; however, the difference was not statistically significant ( $p > 0.05$ ).

### Morbidity pattern

Figure 1 shows the percentage of children in each location suffering from various illnesses or abnormality during the period of study. Of the children in the day-care study group, 26.6% presented with at least one episode of fever during the study period, while 20.1% of children in the home environment had same symptom ( $p > 0.05$ ). Significantly more children in day-care had upper respiratory tract infection (URTI) compared with those cared for in the home environment during the same period of study 66(72%) vs. 31(34.1%) {RR=2.31, (1.62-3.30),  $p=0.000004$ }. Similarly, a higher proportion of day-care attendees had diarrhoea 24(26.4%) compared with 7 (7.7%) of children cared for at home {RR= 1.74, (1.34-2.26),  $p=0.0016$ }. There was a measles outbreak during the study period and 7 (6.5%) of children in the day-care centres had measles while none of the children in the home environment had measles. Skin infection was found in 6.0 and 5.0% of the day-care study group and home study group, respectively ( $p > 0.05$ ). Prevalence of umbilical hernia was high as this abnormality was present in 21 and 18% of children in day-care and home environment respectively.

**TABLE 1. Age-sex distribution of children in the study**

Age in Months	Day Care center			Home		
	Male (%)	female(%)	total(%)	Male(%)	female(%)	total(%)
0-6	2 (4.4)	3 (6.7)	5 (5.5)	24 (41.4)	9 (27.2)	33 (36.3)
	13 (28.3)	7 (15.6)	20 (22.0)	7 (12.1)		
7-12	15 (32.6)	22 (48.9)	37 (40.7)	7 (12.1)	12 (36.4)	19 (20.9)
13-18	16 (34.8)	13 (28.9)	29 (31.9)	20 (34.4)	0 (0.0)	7 (7.7)
19-24					12 (36.4)	32 (35.1)
total	46 (50.5)	45 (49.5)	91 (100.0)	58 (63.7)	33 (36.3)	91 (100.0)

### Characteristics of care-givers at day-care centres

There were a total of twelve caregivers and all were female. A little over half (58.3%) were young, aged 20-25yrs, single and without any children. One third (33.3%) were either illiterate or had primary education, 50% had part-secondary education while only 16.7% had full secondary education. The average staff-child ratio was 1:8 and most of the day-care centres were overcrowded, often with as many as six to eight children placed side by side on a mattress in a standard room with one or two adult care giver.

### Duration of stay in day-care centres

The average duration of stay per day in the day-care centres was 6-8 hours for 71.4% of the children. Nine (9.9%) children stayed for less than 6 hours while 17(18.7%) children stayed in the day-care centres for between 9 and 11 hours daily.

## Discussion

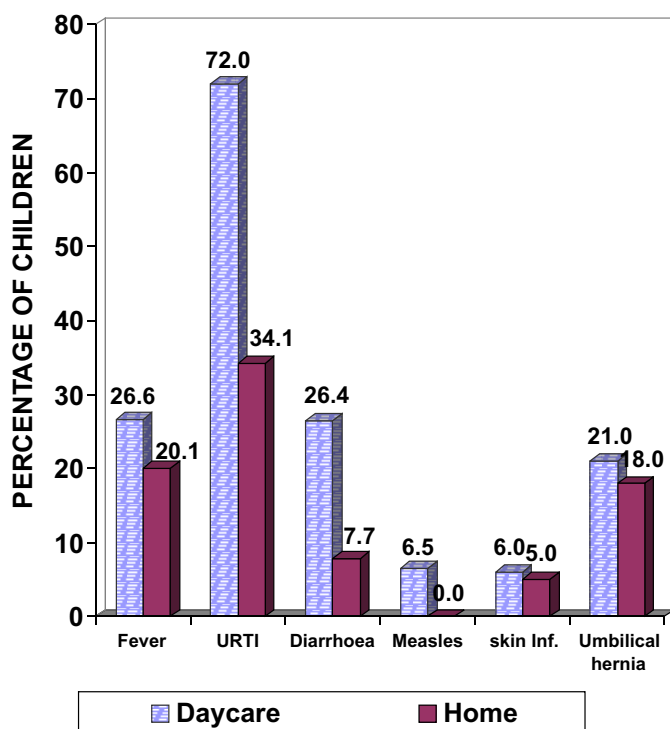
The study shows that the children attending day-care centres were more likely to be moderately underweight and wasted lending support to what had previously been observed in this environment.<sup>4</sup> This could probably be due to the fact that children attending day-care centres experience more episodes of diarrhoea and URTI which are known risk factors for malnutrition, and have lesser opportunity for being adequately breastfed than their counterparts being cared for in the home environment. The percentage of children who were wasted was much lower than the national and regional rates.<sup>15, 16</sup> Stunting was more commonly observed among children cared for at home. Reasons for this are not immediately clear. However, as day-care centres are not cheap, there may be self-selection with respect to those who utilize them, with the poorer, less educated mothers remaining at home with their children. More studies are, however, needed to explain why children cared for at home have higher rates of chronic malnutrition.

The immunisation coverage of children in both groups was quite high compared with the national and regional rates.<sup>16</sup> The immunisation coverage rates documented in this study were also much higher than that reported in much earlier studies.<sup>4, 15</sup> This may be due to increased awareness by the parents and guardians of these children. Government efforts in recent years to health educate the populace through the media and most especially during the National immunisation days may be contributory.

Measles occurred only in the children attending day-care centres. This is probably due to the increased risk of exposure afforded by the day-care setting. It is noteworthy that the immunisation coverage of children in both groups was high, with the exception of measles immunisation in the children attending day-care centres. This could also have contributed to the higher incidence of measles in this group. The finding of the lower percentage coverage of measles vaccination as compared to other vaccines in the National Programme Immunisation (NPI) is similar to that reported by the national reports on the NPI. The implication is that there should be more emphasis and thrust by promoting measles vaccination. One of the concerns about the use of day-care is the contribution of group settings to childhood morbidity. Measles infection is one of the top five causes of death in children under 5 in Nigeria.<sup>16</sup> Fortunately the outbreak experienced at the day-care centres was not associated with any deaths. This would have, however, made it more obvious that day-care establishments are potentially hazardous to young children when they are not properly immunized. Most of the day-care centres in this study were overcrowded and vaccine preventable diseases tend to occur when there is overcrowding and vaccinations are not optimal.<sup>17</sup> In addition, several studies have found overcrowding rather than malnutrition to be the determinant of measles morbidity and mortality.<sup>18, 19</sup> It is recommended that measles be targeted for higher coverage and children without up-to-date vaccination status should not be allowed to attend day-care centres. Overcrowding should indeed be discouraged as much as possible in day-care centres.

indeed be discouraged as much as possible in day-care centres.

The average length of stay in the day-care centre per day per child is 6-8 hrs with some staying as long as 9-11 hours. This finding is similar to the report of Oyemade and Oyewole in their series, where they found that about one quarter of children placed in child-care centres were below the age of two years and were known to spend from 6-11 hours every day there.<sup>5</sup> This is not good, especially, as it reduces considerably the mother-child contact hours per day and consequently may affect the adequacy of breastfeeding. The staff-child ratio in almost all the centres was found to be very poor similar to findings of the same researchers, indicating that there has not been much improvement in this respect over the last two decades.<sup>5</sup> Frankel found that beginning from the first year of life, children seem capable of forming multiple bonds while retaining the central importance of the mother-child bond.<sup>20</sup> This brings to fore the importance of having the right type of caregivers in the day-care centres. A little over half of the attendants were not only single, but also inexperienced and below twenty-five years old, while the others were either married or widowed and over forty years old. None were between 26-40 years of age. If at such tender ages the Nigerian child must of necessity stay away from their parents for more than two-thirds of the hours they are awake in a day, then it becomes imperative that this alternative source of child care meets the child's needs because of the far-reaching effects on the physical, mental and psychological well being.



This study has shown that children placed in groups of other children experience more illnesses such as fevers, diarrhea, and respiratory tract infections than their peers who remain at home; findings that are corroborated by other researchers.<sup>8-10,21-26</sup> Disease transmission can be minimized by infection control behaviours. Placing children in day-care should not compromise their health

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