Nutritional status of day and boarding students attending school for special needs in North-central Nigeria

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Abstract

Background: Less information is available on the nutritional status of disabled children in developing countries where the situation is further complicated by widespread malnutrition among the general population. The study assessed and compared the nutritional status between day and boarding students of the school for special needs Ilorin Kwara State.

Methods: The study was a descriptive cross-sectional study using quantitative method of data collection from 300 respondents. Nutritional status was assessed using anthropometric measures and Data was analysed using SPSS software version 21.0. Level of significance was pre-determined at p-value < 0.05 at a confidence level of 95%.

Results: More than half of the respondents 173 (58%) had normal weight while 127 (42%) were underweight. Female respondents had higher BMI than male respondents. There was a significant relationship between BMI of respondents with age among the boarding students. Many of the boarding students 105 (44.7%) were underweight compared with the day students. The BMI and sex of respondents in both day and boarding schools had no significant relationship.

Conclusion: Nutritional status had significant relationship with age, gender, meal frequency and mother's level of education. Day students had better nutritional status compared with the boarding students. Government, parents and caretakers should give more attention on nutritional need of this category of the population.

Key words: Nutrition, status, school, students, needs

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État nutritionnel des élèves de jour et des pensionnaires fréquentant une école pour besoins spéciaux dans le centre-nord du Nigéria

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Resume

Objectif: On dispose de moins d'informations sur l'état nutritionnel des enfants handicapés dans les pays en développement, où la situation est encore compliquée par la malnutrition généralisée de la population en général. L'étude a évalué et comparé l'état nutritionnel entre les élèves de jour et les pensionnaires de l'école spécialisée dans l'État d'Ilorin Kwara.

Méthodes: L'étude était une étude transversale descriptive utilisant une méthode quantitative de collecte de données auprès de 300 répondants. L'état nutritionnel a été évalué à l'aide de mesures anthropométriques et les données ont été analysées à l'aide du logiciel SPSS version 21.0. Le niveau de signification a été prédéterminé à une valeur $p < 0,05$ avec un niveau de confiance de 95%.

Résultats: Plus de la moitié des répondants 173 (58%) avaient un poids normal, tandis que 127 (42%) avaient un poids insuffisant. Les femmes interrogées avaient un IMC supérieur à celui des hommes. Il existait une relation significative entre l'IMC des répondants et l'âge parmi les pensionnaires. Beaucoup d'étudiants en internat 105 (44,7%) avaient un poids insuffisant par rapport aux étudiants en classe de jour. L'IMC et le sexe des répondants des écoles de jour et des pensionnats n'avaient pas de relation significative.

Conclusion: l'état nutritionnel avait une relation significative avec l'âge, le sexe, la fréquence des repas et le niveau d'éducation de la mère. Les élèves de jour avaient un meilleur état nutritionnel par rapport aux pensionnaires. Le gouvernement, les parents et les gardiens devraient accorder plus d'attention aux besoins nutritionnels de cette catégorie de la population.

Mots clés: Nutrition, statut, école, élèves, besoins

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INTRODUCTION

The school health importance has been recognized across countries since the start of 20th century. In several developed countries, school health programs have evolved during the post-2nd World War period and addressed nutritional and physical-fitness aspects. This was in response to poor nutritional status among lower middle class and working-class children. School health's services have tended to focus on nutritional support and clinical assessment (1). Schools provide a setting for learning skills, and for increase of intelligence that can be used by students to achieve their aims in life therefore are sacred (2). Children need good wellbeing to learn efficiently." Health is a key issue in school entry, as well as continued contribution and achievement in school.

Malnutrition remains a serious public health problem in current age (3). Regardless of the economic growth perceived in developing countries, malnutrition and particularly under-nutrition is still highly widespread (4). Malnutrition refers to deficiencies, excesses or imbalances in a person's intake of energy and/or nutrients. Malnutrition is tantamount with growth failure in children. Malnourished children are smaller and lighter in weight than they ought to be for their age (5). With the high frequency of poverty and HIV/ AIDS, there is also high prevalence of malnutrition (6). Malnutrition needs to be seen as a sign of inadequate provision of some of the most elementary of all human rights. Also, it is a reflection of inadequate investment and growth in a range of issues that are associated to human capital development and has a substantial impact on the future economic growth of a country (7). Some studies are now emphasising the worries of micronutrient deficiencies in particular among schoolchildren (7,8). The school age is an active period of development and growth. Physical, mental, social growth of child takes place during this period (9). Both the growth and cognitive development may be impaired by deprived health and malnutrition of primary school children. School children are intensely affected by anaemia (8), vitamin A deficiency (10) and opportunistic infections (11) with adverse effect on their nutritional status 11,12 as well as on their mental development and performance in school (9,13,14). There is rising evidence of considerable burden of illness and death due to communicable diseases and malnutrition in school children in emerging countries. Respiratory problems, refractive errors, nutritional disorders, anaemia, parasitic infestations, diarrheal disease, pediculosis, caries teeth, skin diseases, and ear and throat problems, tic disorders and sleeping disorders were noticed by studies carried out on school children in different countries (15-23) . In developing countries Stunting and wasting are widespread among school age children (23-25). High levels of stunting between children propose that there will also be a lasting deficit in mental and physical development that leaves children incapable to take maximum benefit of learning opportunities in schools.

Malnutrition and disability are equally major world-wide health problems. It was estimated that there are one billion people globally living with a disability of whom about 93 million are children aged under 14 years (5). Globally, almost one billion people are undernourished. Malnutrition remains a main cause of child death, with the latest evaluations suggesting that under-nutrition causes 3.1 million child deaths yearly; 45% of all child deaths. Overweight and obesity being key factors underlying the growing epidemic of non-infectious disease: Over-nutrition is also a problem.

According to World Health Organization (WHO) standards, 52% of school going children in below developed countries are measured normal, where 48% of them are underweight and 10% of them are severely underweight (26,27). More than 200 million school children are underdeveloped and if at this rate no action is taken, about 1 billion stunted school age children will be growing up by 2020 with compromised mental and physical development .[38] Nigeria is also faced with high poverty and child under-nutrition rates (28). More than 54% of preschool-age children, corresponding to more than 9.5 million children, are underdeveloped, 56% are malnourished and more than 17% are wasted (29). Same condition will be virtually found when these children start to go school.

In Nigeria today, most school students are malnourished due to socio economic conditions of the parent/guardian. The scenario becomes worrisome in boarding schools where students are grossly underfed with some important nutritional requirements almost lacking in their intake (30). Nutritional status contributes significantly to the attendance, concentration and academic achievements of

students. Parents refer their children to boarding schools where the schools are with the high expectation of balanced nutrition, moral discipline and qualitative education based on the extremely higher fees paid in comparison to the fees of day students who return to their parents on daily basis. Disabled people are 9often assumed to have poorer nutrition than their non-disabled counterparts and, indeed, surveys in developed countries have shown that disabled children and adolescents are vulnerable to poor nutritional care (31). In contrast, far less information is available on the nutritional status of disabled children in developing countries where the situation is further complicated by widespread malnutrition among the general population.

In sight of this, it is important to determine the nutritional status of the differently-able students. Therefore the aim of this study was to assess and compare the nutritional status between day and boarding students of the school for special needs Ilorin, Kwara State.

MATERIALS AND METHODS

Description of study area: The study was conducted in Kwara State Ilorin East L.G.A. One of the sixteen Local Government Areas of Kwara State. It is located on latitude $8^0$30' and $9^0$00' and longitude $4^0$30' and $5^0$00' East. It shares boundaries with Ilorin South L.G.A to the south, Ilorin West L.G.A to the west, Moro L.G.A to the north and Ifelodun L.G.A to the east. The local government headquarter is Oke-oyi. The School for the special needs is the only school of its kind in state providing education for the children with hearing, sight and cognitive impairments. The total number of pupils as at the time of the study is four hundred and thirty (430) with majority in the boarding school.

Study Design: The study was a descriptive cross-sectional study using quantitative method of data collection.

Study Population: The study population comprised of day and boarding students of the school for special needs Ilorin, Kwara State.

Inclusion and exclusion criteria

Inclusion criteria: All consenting primary and secondary school students who were currently in the day and boarding facility were included in the study.

Exclusion Criteria: The study excluded all the mentally impaired students. Those with evidence of mal absorption were excluded from the study. Those with latest history of diarrhoea disease or weight loss.

Sample Size Determination: The sample size was calculated using Fisher's formula and the total number of 300 students were studied.

Sampling technique: All consenting students of the day and boarding school were included in the study.

Data Collection Instrument: A semi – structured interviewer administered questionnaire was used to obtain information from the participants. In addition, weighing scale was used to measure the weight, stadiometer was used to measure the height. A dietary recall was used to determine the dietary pattern.

Data Collection: Four trained research assistants participated in the data gathering after a detailed explanation as to the aim of the study was given to all the qualified respondents. Informed consent was sought and gotten from each of the participants with anonymity and confidentiality of the information obtained was assured and preserved. Weights of respondents were measured using weighing scale and heights were measured. The weight measuring scale was standardized daily before using.

Data Analysis: Statistical software package (SPSS) version 21.0 was used for data analysis. Chi square statistical test was used to determine association between the nutritional status and dietary pattern of respondents. A 95% confidence level was used and (P <0.05) was considered statistically significant. The BMI of respondents was classified as follows;

Classification of BMI (kg/m^2) values by WHO

BMI	**NUTRITIONAL STATUS**
Below 18.5	underweight
18.5-24.9	normal
25.0-29.9	pre-obese
30.0-39.9	obese
Above 40	very obese

Ethical Consideration: Ethical approval was gotten from the Ethical Review Committee of Faculty of Clinical Sciences through Department of Epidemiology and Community Health. An advocacy visit was paid to the school where the principal granted the Permission to conduct the study and confidentiality of the information was also ensured.

Limitations: There was communication barrier which was solved by getting an interpreter.

RESULTS

Three hundred (300) questionnaires were duly completed and analysed. The respondents were from the school for special needs Ilorin, Kwara State. The mean age (± standard deviation) of respondents was 15.7 (± 3.839). The age ranged from 10 to 29. Most of the respondents 132 (44.0%) were between 10 to 14 years, 112 (37.3%) were between 15 to 29 years, 52 (17.3%) were between 20 to 24 years and 4(1.3%) were 25 to 29 years. The sex distribution revealed more males than females. There were 174 (58%) males with majority 235 (78.3%) found in the boarding school.

Majority of the respondents were Yoruba 236 (78.7%), 33 (11%) were Hausas and 30 (10%) were Igbos while the remaining 1 (0.3%) belong to other ethnic group such as Nupe. Islam was the religion practiced by majority 203 (67.7%) of the respondents while the remaining 97 (32.3%) were Christians. Most of the respondents 89(29.7%) were the first child of their family (Table 1).

More than half of the respondents 173 (58%) had normal weight while 127 (42%) were underweight which is considered as being malnourished (Fig. 1). Female respondents had higher BMI than male respondents (Table 2). Table 3 showed that there was a significant relationship between factors affecting nutritional status of respondents such as age, gender, meal frequency and BMI of respondents ($P>0.05$). Others such as type of family, food liked best, mothers educational level showed no significant relationship with the BMI of respondents.

There was a significant relationship between BMI of respondents with age among the boarding students. Many of the students in the boarding school 105 (44.7%) were underweight when compared with the day students (Table 4).

There is no significant relationship between the BMI and sex of respondents in equally day and boarding schools. Although not statistically significant however, majority 86.4% of males in the day school were underweight likened to the males 62.9% in the boarding school. The mean BMI according to sex in the day school for male and female were 18.71 (± 3.103) & 20.53 ± 2.734 correspondingly while the mean BMI for both male and female in the boarding school were 18.26 (± 2.901) & 19.26 (± 3.204) respectively (Table 5).

DISCUSSION

According to the results of the study, the mean age (± standard deviation) of the participants was 15.74 (± 3.839) years with majority in the age bracket of 10 to 14 years of age and more as boarding students than day students. This is in contrast to the study in Accra Ghana, where non-boarding students were more than boarding students (33). There males were more than the females.

The religion of majority of the respondents was Islam because it was Muslim dominated community while the remaining were Christians. The cosmopolitan composition of Ilorin is supported by the findings of mixed ethnic group within the study area, though the inhabitants are predominantly Yoruba's possibly owing to the fact that this study was carried out in Yoruba dominated area.

There was higher literacy rate of the mothers of the respondents as most of them had tertiary education than fathers which is in contrast to the findings of Mwaniki and colleagues done in Kenya (34). From the studies majority of the respondents had normal weight, while others were underweight (a form of malnutrition) with no respondents been overweight and obese.

There was no high prevalence of overweight in this study unlike in Lagos state, Nigeria where a relatively high level of overweight was observed among students of similar status with our study population (35). Another interesting point to note is that underweight status increased significantly among the respondents between the ages of 10 and 14 compared to those between the ages of 15 and 19. Most people between the ages of 15 -19 had normal weight when likened to the respondents between the ages of 10 to 14 years.

Students in the boarding school between the ages of 10 to 14 were more underweight when likened to the participants between the ages of 15 to 19. This trend observed in current study may be owing to the fact that the dietary practices of younger children are more reliant on on parental control and parents are more expected to encourage younger children to eat more so as to gain weight and height which the children in the boarding school do not get from their parents because they spend more time in school than home. Some parents do abandon their children in the school during holidays when they are supposed to be at home to get nutritional support. This act of neglect is probably due to their disability in those children, and this could explain the higher prevalence of under nutrition observed

among the ages of 10 to 14 compared to 15 to 19 years who are less dependent on their parents.

Age of respondents has no significant relationship with BMI in this study and this is also similar to the study done in Oyo and Abeokuta. However, the prevalence of underweight among the respondents, was similar to a study among adolescents in India which found that 28–40% of their study subjects were undernourished (36). Although, the Indian study stated that girls were more underweight than boys , while this study found that boys were more underweight compared to girls which is in agreement with a previous study conducted by Shahabuddin et al., who reported that boys were more affected in this regard than girls (37) .

This study found that age, gender and meal frequency had significant relationship with the nutritional status of the participants. The mother level of education also has significant relationship with the nutritional status of the respondents which is similar to the study conducted by Ijarotimi (32) and also similar to the findings of others where there was a strong linkage between maternal education and nutritional status of children in Kenya (38,39). It is known that, childcare is largely the responsibility of the mothers. Factors such as low literacy/educational level will affect the nutrition of the family; this perhaps explained the finding of this study. The study also showed that more than half of the boarding students had normal weight with large proportions of participants with normal weight among females compared with males. Underweight was slightly more predominant among males than females. BMI have no significant relationship with the sex of respondents.

The overall nutritional status showed that majority 66.2% & 53.3% of both day and boarding students respectively were of normal weight. This is similar to the study in Accra where most of the students had normal weight. The study shows that among the day and boarding students, the female respondents had higher BMI than the male respondents. The day students had better nutritional status than the boarding students. This is so, for the day students are under the care of family and had their needs (including nutrition) better attended to than the boarding students.

CONCLUSION

This study revealed that majority of the respondents in the school for special needs Ilorin, Kwara State falls between the normal nutritional status and the overall mean body mass index for females was higher than that of male. Underweight status increased significantly among the respondents between the ages of 10 to 14 compare to those between the ages of 15 to 19. Nutritional status had significant relationship with age, gender, meal frequency and mother's level of education. The study also shows that the day students had better nutritional status compared with the boarding students.

The government should ensure that; government boarding schools have adequate resources to adequately take care of the students in the boarding schools, pre-breakfast meal and pre-dinner should also be encouraged by the school and parents. Caretakers should ensure younger children in the boarding school between the ages of 10 to 14 eat more in order to add weight and height.

More work should be carried out to establish dietary pattern and food combinations, which are most effective in preventing diseases.

Conflict of interest: None to disclose.

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Table 1: Socio demographic characteristics of respondents (n=300)

Variable	Frequency	Percentage
Age Group		
10 – 14	132	44.0
15 – 19	112	37.3
20 – 24	52	17.3
25 – 29	4	1.3
Mean ± SD	15.74± 3.83	
Mode of study		
Day	65	21.7
Boarding	235	78.3
Gender		
Male	174	58.0
Female	126	42.0
Religion		
Islam	203	67.7
Christianity	97	32.3
Tribe		
Yoruba	236	78.7
Hausa	33	11.0
Igbo	30	10.0
Other	1	0.3
Position in family		
1	89	29.7
2	80	26.7
3	84	28.0
4	46	15.3
5	1	0.3

Table 2: Mean values of BMI of respondents according to sex (n=300)

BMI	Male	Female
Mean ± SD	18.39 ± 2.95	19.47 ± 3.16
Range (Min – Max)	10.18 – 24.24	12.63 – 24.69

Table 3: Factors affecting Nutritional status of respondents by BMI (n=300)

Variable	BMI			χ^2	p value
	< 18.5	18.5 – 24.9	Total		
Age Group					
10 – 14	73 (55.3)	59 (44.7)	132(100.0)	17.978	< 0.001*
15 – 19	37 (33.0)	75 (67.0)	112(100.0)		
20 – 24	17 (32.7)	35 (67.3)	52 (100.0)		
25 – 29	0 (0)	4 (100.0)	4 (100.0)		
Gender					
Male	85 (66.9)	89 (51.4)	174 (58.0)	7.208	0.007*
Female	42 (33.1)	84 (48.5)	126 (42.0)		
Meal frequency					
Twice	21 (87.5)	3 (12.5)	24 (100.0)	21.865	< 0.001*
Thrice	9 (36.0)	16 (64.0)	25 (100.0)		
> 3	97 (38.6)	154 (61.4)	251(100.0)		
Father's Education					
No formal	36 (43.9)	46 (56.1)	82 (100.0)	2.289	0.515
Primary	23 (48.9)	24 (51.1)	47 (100.0)		
Secondary	19 (34.5)	36 (65.5)	55 (100.0)		
Tertiary	49 (42.2)	67 (57.8)	116(100.0)		
Mother's Education					
No formal	23 (34.8)	43 (65.2)	66 (100.0)	6.948	0.074
Primary	24 (51.1)	23 (48.9)	47 (100.0)		
Secondary	19 (32.2)	40 (67.8)	59 (100.0)		
Tertiary	61 (47.7)	67 (52.3)	128(100.0)		
Type of family					
Monogamy	79 (44.4)	99 (55.6)	178(100.0)	0.753	0.386
Polygamy	48 (39.3)	74 (60.7)	122(100.0)		
Food liked best					
Carbohydrate	117 (44.0)	149 (56.0)	266(100.0)	1.752^{Y}	0.417
Protein	10 (30.3)	23 (69.7)	33 (100.0)		
Fruit	0 (0.0)	1 (100.0)	1 (100.0)		

χ^2: Chi-square test; *: *p* value< 0.05 (statistically significant)

Table 4: BMI of respondents according to age (day and boarding)

Age group	Day n (%)		Boarding n (%)	
	Underweight	**Normal weight**	**Underweight**	**Normal weight**
10 – 14	9 (40.9)	13 (59.1)	64 (58.2)	46 (41.8)
15 – 19	8 (33.3)	16 (66.7)	29 (33.0)	59 (67.0)
20 – 29	5 (26.3)	14 (73.7)	12 (32.4)	25 (67.6)
Total	22 (33.8)	43 (66.2)	105 (44.7)	130 (55.3)
χ^2 (*p* value)	0.974 (0.614)		17.162 **(0.001*)**	

χ^2: Chi square test, *: *p* value < 0.05 (statistically significant)

Table 5: BMI of respondents according to sex (day and boarding)

Gender	Day n (%)		Boarding n (%)	
	Underweight	**Normal weight**	**Underweight**	**Normal weight**
Male	19 (86.4)	26 (60.5)	66 (62.9)	63 (48.5)
Female	3 (13.6)	17 (39.5)	39 (37.1)	67 (51.5)
Total	22 (100.0)	43 (100.0)	105 (100.0)	130 (100.0)
χ^2 (*p* value)	4.690 (0.096)		4.863 (0.088)	

χ^2: Chi square test, *: *p* value > 0.05 (statistically not significant)

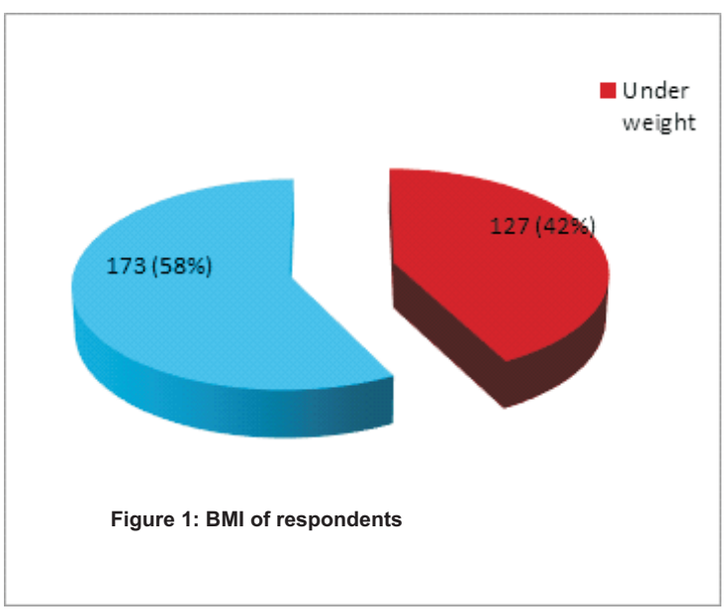

Figure 1: BMI of respondents