BREAKFAST PRACTICE AND ANTHROPOMETRIC CHARACTERISTICS OF SCHOOL AGE CHILDREN IN OYO METROPOLIS, OYO STATE, NIGERIA

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ABSTRACT

Background: Information on current gaps in the breakfast practice is important to design appropriate intervention message and strategies to promote appropriate breakfast practices among school age children.
Objective: This study was therefore designed to assess the breakfast practice and anthropometric characteristics of school age children in Oyo metropolis, Nigeria.
Methodology: This descriptive cross-sectional study involved 1038 public school pupils selected using a three-stage sampling technique across Oyo metropolis, southwest Nigeria.A semi-structured, interviewer-administered questionnaire was used to elicit information on the socio-demographic characteristics and breakfast consumption of the pupils. Height and weight were assessed and analysed using standard procedure. Data were analysed using descriptive statistics at $p<0.05$.
Results: Age was 11.18±4.7 years, 54.3% were females, 16.9% were underweight and 5.5% were overweight/obese.The rates of breakfast intake and skipping were 91.5% and 8.5%, respectively. About 95% of pupilsconsumed breakfast before the 9.00amand92.2% had satisfaction with breakfast intake. About 49% had experienced hunger pang in school, of which 72.8% usually occurred between the 11:00am and 1.00pm of the day. Most pupils (94.2%) had access to school living allowance, and most purchased item was drinks and beverages (52.0%). The predominant breakfast meals were rice(61.5%), beans (31.2%) and bread (9.5%).
Conclusion: Breakfast habit among school age children in Oyo metropolis was characterized by low but unacceptable level of meal skipping, low intake of fruits, seeds and nuts, and animal based foods including eggs and dairy products.

Keywords:
Breakfast Consumption, Anthropometric Characteristics, Public school pupils, Breakfast skipping

INTRODUCTION

Breakfast is the first meal and the brain's first shot of fuel for the day following about 12 hours fast, thus it is generally regarded as the most important daily meal. For school age children, breakfast is important to provide the energy and other nutrients required to support learning and physical activities, improve strength and endurance, promote better attitude towards school work and enhance school performance[1]. Studies across the globe have shown numerous benefits associated with breakfast intakes to include increased verbal and full intelligence quotient and general cognition[2], higher fruits, vegetables and dairy intake[3], healthier dietary habit and adequacy of total daily intake[4], lower body adiposity and reduced childhood obesity[3,5,6,7], reduced likelihood of unhealthy snacking[8], and reduced risk of type 2 diabetes mellitus[9]. Moreover, emerging evidence suggests the need to equally emphasise on quality of breakfast meals. Quality breakfast confers additional benefits such as enhanced overall dietary pattern[10], favourable type 2 diabetes risk profile[9], higher fibre intake and lower cholesterol concentration and increased vitamins and minerals intakes[11]. A breakfast is considered to be of good quality if it includes whole-grain products, fruit and (semi-) skimmed milk products or an alternative source of calcium[10].

Despite these short and long-term health promoting benefits, the practice of breakfast consumption among children has shown consistent decline overtime, particularly in urban areas in both developed and developing countries[1,12,13,14]. Also worrisome is the decline in regular breakfast consumption with increasing age of children[15]. This trend contributes to the high burden of child and adolescent malnutrition and consequently poor physical and mental growth, and increased susceptibility to infections[12]. In Nigeria, studies have shown that about one in five to one in two children missed breakfast[16,17]. This reflects that many school age children in Nigeria were disadvantaged and daily at risk of malnutrition, poor health and poor learning outcomes. In addition, the quality of breakfast is an important concept which remains largely unexplored in Nigeria context. In recent times, efforts to address malnutrition among school age children and promote public school enrolment have necessitated the introduction of home grown school feeding programme which provide one meal per day for some children in public schools, however, coverage remains poor.

Addressing breakfast habits at the early formative years is important since lifestyle and behavior habits entrenched during childhood are likely to remain throughout adulthood. It is therefore essential to gather information on the current breakfast practice among school age children, this would help to identify the current gaps in the current practice and inform the design of appropriate intervention message and strategies to promote appropriate breakfast practices. This study was therefore designed to assess the breakfast practice and anthropometric characteristics of school age children in Oyo metropolis, Nigeria.

METHODOLOGY

This descriptive cross-sectional study was conducted in the ancient and metamorphosed metropolitan town of Oyo located in Oyo State, southwestern region of Nigeria. One thousand and eighty pupils attending public primary schools were selected across four Local Government Areas (LGAs). The selection of the pupils was done through a three-stage sampling technique. In the first stage, the four LGAs (Oyo East, Oyo West, Atiba and Afijio LGAs) in Oyo and an adjoining towns of Ilora were purposely selected, and then six public primary schools were selected per LGA using simple random sampling approach. In the third stage, 15 pupils were selected through systematic sampling technique from class register of pupils in Primary 4, 5 and 6 in each of the participating schools. A total of 1038 pupils eventually completed the study.

A pre-tested, semi-structured, interviewer-administered questionnaire was used to elicit information on the socio-demographic characteristics and breakfast consumption of the pupils. Height and weight were assessed using stadiometer calibrated in centimeters (cm) and SECA digital weighing scale, respectively. World Health Organization Anthroplus

software was used to determine the anthropometric characteristics of the pupils through the estimation and categorization of the pupils' z-scores. Pupils with z-score below -2SD were categorized to be wasted, those between -2SD and +2SD had normal nutritional status while those with z-score more than +2SD were categorized to be overweight and obese. Data obtained were coded and analysis was done using IBM-SPSS version 20.0. Descriptive statistics were presented in frequency counts, percentages, mean and standard deviation while inferential statistics engaged the use of Chi-square test with a p-value of set at 0.05.

Ethical approval for the study was obtained from the University of Ibadan/University College Hospital Ethics Review Committee (NHREC/05/01/2008a:UI/EC/17/0346). Permission to conduct this study was obtained from the Local Education Authority as well as the Head Teachers of the selected primary schools. Informed consent was sought from each pupil as they were informed that refusal to participate in the study or withdrawal did not attract any penalty. Confidentiality and privacy of the respondents were ensured during the course of this study.

RESULT

Socio-demographic characteristics of the pupils

The socio-demographic characteristics of the pupils covered in this study is presented in Table 1. Age was 11.18±4.7 years, about 60.5%, 39.2% and 0.3% of the participants were within the age ranges of 8-11 years, 12-16 years and 17 years or above, respectively. There were more female pupils (54.3%) than male pupils (45.7%) in the study, and 95.8% were of Yoruba ethnicity. Also, majority of the pupils (75.9%) lived with both parents, 12.7% lived with their mothers, 8.6% with grandparents and 2.8% with father only. Distribution according to household size shows that 51.0% were from large households (≥7 people), 42.8% were from medium size households (4-6 people) and 23.8% came from small households.

Breakfast consumption practice among sampled pupils

The breakfast consumption practice among the pupils is presented in Table 2. Majority of the pupils (86.2%) eat three times daily, 9.1% ate more than three times and 4.7% eat two meals or fewer per day. About 85 percent usually consumed breakfast at home, out of which 89.7% consumed breakfast four or more times weekly. Also, 81.2% consumed breakfast before the 8.00am and 13.6% between 8.00am and 9.00am. About 68 percent of the pupils attended school with food pack, out of which 57.7% and 19.8% consumed the breakfast before the 9th hour and between 9thand 11th hour of the day, respectively. Most of the pupils (92.2%) had satisfaction with breakfast and 91.5% consumed breakfast on the day of the interview. About 58 percent of the pupils preferred to eat breakfast at home while 42.2% preferred to eat in school. Almost half of the pupils (49.1%) had experience of hunger pang in school, of which 72.8% usually occurred between the 11th and 13th hour of the day. Most of the pupils (94.2%) had access to school living allowance of an average of N60, including N50 and below (67.1%), N51-N100 (27.6%) and more than N100 (5.3%). About 52 percent of the pupils spent their school living allowance on drinks and beverages and only 0.1% spent it on fruits. In the households of the sampled pupils, mothers (85.0%) usually prepared the breakfast. Only 25.5% of the sampled pupils benefitted from the National Home Grown School Feeding Programme in the state.

Breakfast meals among the pupils

The breakfast meals among the pupils including the commonly consumed, preferred and meal on the interview day is presented in Figure 1. The most common breakfast meal was rice, leading as the most commonly consumed (74.3%), most consumed on the interview day (61.5%) and the most preferred (60.6%). Beans was commonly consumed by 41.6%, preferred by 34.4% and consumed on interview day by only 31.2%. Egg was the only prominent animal protein in the breakfast meals of these pupils, it was commonly consumed

by 7.2%, preferred by 14.2% and only 6.8% consumed egg on the interview day. Bread was commonly consumed by 10.7%, preferred by 13.4% and consumed on the interview day by only 9.5%. The anthropometric characteristics of the pupils is presented in Table 3. Prevalence of wasting was 16.9% while 5.5% were overweight/obese.

Table 1: Socio-demographic characteristics of sampled school age children in Oyo metropolis

Demographic variables	Frequency	Percentage
Age (years) (Mean – 11.18±4.7)		
8-11	628	60.5
12-16	407	39.2
≥17	3	0.3
Gender		
Male	474	45.7
Female	564	54.3
Ethnicity		
Yoruba	994	95.8
Igbo	32	3.1
Hausa	12	1.2
Religion		
Christian	608	58.6
Muslim	411	39.6
Traditional	19	1.8
Fathers occupation		
Artisan	206	19.8
Trader/Businessman	295	28.4
Farmer	241	23.2
Government/Private Employee	228	22.0
Health worker	20	1.9\
Cleric/Traditionalist	35	3.4
Others	13	1.3
Mothers occupation		
Artisan	178	17.1
Trader/Businesswoman	639	61.6
Farmer	80	7.7
Government/Private Employee	95	9.2
Health worker	36	3.5\
Others	10	1.0
Living arrangement		
Father	29	2.8
Mother	132	12.7
Father and Mother	788	75.9
Grandparent	89	8.6
Household size		
< 4 people (Small)	65	6.3
4-6 people (Medium)	444	42.8
≥7 people (Large)	529	51.0
No of children in the household		
Less than 4 children	247	23.8
4-6 children	614	59.2
≥7 children	177	17.1
Total	**1038**	**100.0**

Table 2: Breakfast consumption of primary school age children in Oyo metropolis

Breakfast Consumption	Frequency	Percentage
No of meals consumed per day		
≤ 2 times	49	4.7
Three times	895	86.2
More than three times	94	9.1
Usually consumed breakfast at home	883	85.1
Weekly consumption of Breakfast (n=883)		
≤ 2 times	37	4.2
Three times	54	6.1
Four or more times	792	89.7
Usual time of breakfast Consumption (n=883)		
Before 8:00am	717	81.2
8:00-8:59am	120	13.6
9:00am and after	46	5.2
Attended school with food pack	701	67.5
Usual time packed food was consumed (n=701)		
Earlier or at 8:59am	404	57.7
9:00-10:59am	139	19.8
11:00 and after	158	2.6
Had satisfaction with breakfast	957	92.2
Consumed breakfast on day of interview	950	91.5
Location Preference for Breakfast		
Home	600	57.8
School	438	42.2
Felt hunger pang in school	510	49.1
Usual time of feeling hunger pang (n=510)		
Before 11:00am	54	10.6
11:00-1:59pm	373	72.8
2:00pm and beyond	83	16.3
Had school living allowance	978	94.2
Amount of school living allowance (n=978)		
50 naira and below	656	67.1
51-100 naira	270	27.6
Above 100 naira	52	5.3
Mean (±SD)= 60.1±38.4		
Items purchased with school living allowance (n=978)		
Food	455	46.5
Snacks and Biscuits	508	51.9
Drinks and Beverages	14	1.4
Fruits	1	0.1
Person that usually prepared breakfast		
Father	24	2.3
Mother	882	85.0
Other family members	132	12.6
Participated in the HGSF programme	265	25.5

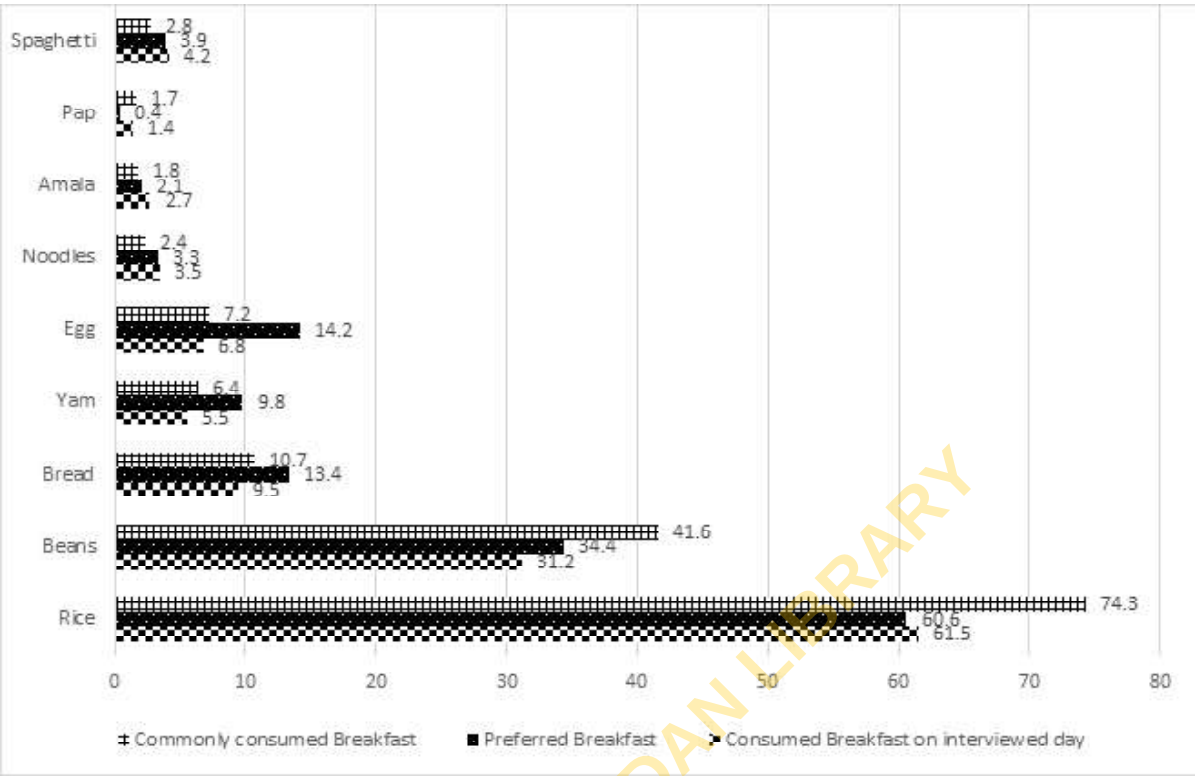

Figure 1: Breakfast meals among the school age children in Oyo metropolis

Table 3: Anthropometric characteristics of school age children in Oyo metropolis

BMI-for-age	Frequency	Percentage
Underweight (<5th percentile)	175	16.9
Normal (5th – 85th percentile)	806	77.6
Overweight (>85th percentile)	57	5.5
Total	**1038**	**100.0**

DISCUSSION

Breakfast intake and quality of food consumed is important to a child's nutritional status as it impacts the mental and physical development, and the overall health[18]. In this study, about 95% eat three or more times daily, however the proportion of breakfast intake and skipping is 91.5% and 8.5%, respectively. The percentage of pupils who skipped breakfast remains unacceptably high though this was much lower than reported by earlier studies in Nigeria and some other nations. Studies in Nigeria have reported that about 22.3-52.0% of school age children missed breakfast[16,17,19]. Studies from Ghana (14.5%)[1], South Africa (19%)[20], and Iran (18.9%)[3] have also reported similarly high proportion of breakfast skipping among school age children whereas only 3.5% missed breakfast in Portugal[21]. This trend shows that Africa particularly needs to pay more attention to promoting healthy dietary habit particularly regular breakfast intake among school age children. The low proportion of breakfast skippers in the present study compared to earlier

studies may be attributed to increasing enlightenment and public nutrition education in the study areas following close proximity to various institutions of higher learning with interest in nutrition and health. Nevertheless, there is a need to intensify efforts aimed at promoting appropriate breakfast habits and ensure no child is left behind.

One unique dimension of the present study is an attempt to explore the typical meals consumed at breakfast. Expectedly, rice constituted the most common breakfast meal, other notable breakfast meals include beans, bread and yam. A similar study in South east Nigeria found bread/cereal group as the major breakfast meal while almost 60% consumed beverages[16]. The similarity in the predominance of cereals as the breakfast meal in the two studies could be a reflection of dietary transition in southern Nigeria from a largely roots and tubers based food to cereals based food culture.A study in Netherlands indicated that a breakfast meal should consist of products from a 'disc of five' food groups including fruit/fruit juice group (low sugar); grains (whole meal bread or cereals); dairy products (low-fat); fats and oils and water, tea or coffee (without sugar)[22]. A good-quality breakfast including whole-grain products, fruit and (semi-) skimmed milk products or an alternative source of calcium had been shown to have a better overall dietary pattern[10]. Though the concept of a good quality breakfast is presently poorly defined in Nigeria context, the non-representation or poor representation of dairy foods, fruits, and nuts and seeds in the breakfast meals in this study is a reflection of the poor quality of breakfast meals among these pupils and a pointer to inadequate intake of micronutrients.

Interestingly, there is a synergy between the actual breakfast meal consumed and the preference of the sampled pupils. This suggests that the preference of the children either played a role in the breakfast preparation in the household or the children had grown to prefer the typical breakfast often provided. This observation may be partly explained by the expressed high level of satisfaction (92.2%) with the breakfast among the children. Egg was the only prominent animal protein in the breakfast meals of these children, and only 6.8% consumed it on the interview day. This reflects poor representation of high quality animal foods in the daily breakfast of larger percentage of the children and could suggest increased likelihood of inadequate protein intake, and vitamins and minerals deficiencies particularly vitamin B12. Generally, few foods are represented in the breakfast meals of the children and this suggest fewer choices despite the abundant food resources and rich food culture in Nigeria. It is also a pointer to poor adoption of diversified breakfast meals among the children despite various innovations in breakfast meals over the past few years.

Almost half of the respondents had experience of hunger pang in school largely between the 11th and 13th hour of the day. This could impact the learning process, reduce the attention span, short-term memory and auditory attention, and influence the overall academic performance of these children[1,2,23]. All the children in this study had access to school living allowance and this was mostly spent on snacks and biscuits while only 0.1% of the pupils purchased fruits. A similar finding has been reported among school age pupils in South east Nigeria where about 80 percent of school break time meal was pastry products[16]. The high consumption of energy dense and nutrient poor snacks may be due to several factors including the school food environment, poor nutrition knowledge and ineffective implementation of food related policies in school areas. It is therefore expedient to ensure that the break time meals in Nigerian schools is regulated to contribute to improving overall diet quality and micronutrients intakes among school age children. This is particularly important considering that about 20 percent of the school age children in this study are malnourished including the prevalence of underweight and overweight of 16.9% and 5.5%, respectively. Similarly high burden of underweight have been reported among school age children in south east Nigeria[16]. Underweight among school age children predisposes to low muscle mass, developmental delays, weakened or compromised immune system and higher susceptibility to infection,

fractures, frailty in later times, hair loss and hair thinning, general fatigue, and psychological issues and increased risks of morbidity and mortality[24,25,26,27].

CONCLUSION

Breakfast habit among school age children in Oyo metropolis is characterized by low but unacceptable level of meal skipping, low intake of fruits, seeds and nuts, and animal based foods including eggs and dairy products. Furthermore, energy dense and nutrient poor pastries constitute the major snacks during school break time. It is important to put in place efforts to promote better breakfast practices among school age children including public nutrition education of mothers, increasing access and affordability of ready to use breakfast foods in Oyo town. In addition, further research is recommended to explore the quality of breakfast meals among Nigerian school age pupils, define in clear terms what a good quality breakfast entails in Nigerian context and identify strategies to make breakfast contributes optimally to diet quality and adequacy of micronutrients intake.

REFERENCES

1. Intiful FD, Lartey A. Breakfast habits among school children in selected communities in the eastern region of Ghana. *Ghana Medical Journal*. 2014 Aug 25;48(2):71-77.
2. Liu J, Hwang WT, Dickerman B, Compher C. Regular breakfast consumption is associated with increased IQ in kindergarten children. *Early Human Development.* 2013 Apr 1;89(4):257-262.
3. Ahadi Z, Qorbani M, Kelishadi R, Ardalan G, Motlagh ME, Asayesh H, Zeynali M, Chinian M, Larijani B, Shafiee G, Heshmat R. Association between breakfast intake with anthropometric measurements, blood pressure and food consumption behaviors among Iranian children and adolescents: the CASPIAN-IV study. *Public Health.* 2015 Jun 1;129(6):740-747.
4. Nicklas TA, Bao W, Webber LS, Berenson GS. Breakfast consumption affects adequacy of total daily intake in children. *Journal of the American Dietetic Association*. 1993 Aug 1;93(8):886-91.
5. Arora M, Nazar GP, Gupta VK, Perry CL, Reddy KS, Stigler MH. Association of breakfast intake with obesity, dietary and physical activity behavior among urban school-aged adolescents in Delhi, India: results of a cross-sectional study. *BMC Public Health*. 2012 Dec;12(1):1-2.
6. Lateef OJ, Njogu E, Kiplamai F, Haruna US, Lawal RA. Determinants of overweight and obesity among adolescent students in public secondary schools in Kwara State, Nigeria. *Current Research in Nutrition and Food Science Journal.* 2016 Aug 27;4(2):96-106.
7. Kang YW, Park JH. Does skipping breakfast and being overweight influence academic achievement among Korean adolescents? *Osong Public Health and Research Perspectives*. 2016 Aug 1; 7(4): 220-227.
8. Van Lippevelde W, Te Velde SJ, Verloigne M, Van Stralen MM, De Bourdeaudhuij I, Manios Y, Bere E, Vik FN, Jan N, Alvira JM, Chinapaw MJ. Associations between family-related factors, breakfast consumption and BMI among 10-to 12-year-old European children: the cross-sectional ENERGY-study. *PLoS One.* 2013 Nov 25;8(11): e79550.
9. Donin AS, Nightingale CM, Owen CG, Rudnicka AR, Perkin MR, *et al.* (2014) Regular Breakfast Consumption and Type 2 Diabetes Risk Markers in 9- to 10-Year-Old Children in the Child Heart and Health Study in England (CHASE): A Cross-Sectional Analysis. *PLoS Med* 11(9): e1001703. doi:10.1371/journal.pmed.
10. Matthys C, De Henauw S, Bellemans M, De Maeyer M, De Backer G. Breakfast habits affect overall nutrient profiles in

adolescents. *Public Health Nutrition*. 2007 Apr;10(4):413-421.
11. Williams PG. The benefits of breakfast cereal consumption: a systematic review of the evidence base. *Advances in Nutrition*. 2014 Sep;5(5):636S-73S.
12. Marika S. Breakfast to learning. *Journal American Dietetic Association*. 2003; 51(2): 8-21.
13. Rampersaud GC, Pereira MA, Girard BL, Adams J, Metzl JD. Breakfast habits, nutritional status, body weight, and academic performance in children and adolescents. *Journal of the American Dietetic Association*. 2005 May 1; 105(5): 743-760.
14. Onyiriuka AN, Umoru DD, Ibeawuchi AN. Weight status and eating habits of adolescent Nigerian urban secondary school girls. *South African Journal of ChildHealth*. 2013 Sep 6;7(3):108-111.
15. Alexy U, Wicher M, Kersting M. Breakfast trends in children and adolescents: frequency and quality. *Public Health Nutrition*. 2010 Nov;13(11):1795-802.
16. Ogechi UP. Breakfast Eating Habits and Nutritional Status of Primary School Children in Orumba South Local Government Area of Anambra State, Nigeria. *Malaysian Journal of Nutrition*. 2015 Dec 1;21(3).
17. Adesola OA, Ayodeji RA, Akorede QJ, Oluranti O. Breakfast habit and nutritional status of undergraduates in Ekiti State, Nigeria. *Science Journal of Public Health*. 2014 Jun 5;2(4):252.
18. Dams J., Metzl JD. School meals and education. *International Journal of Food Science and Nutrition*, 2000 40: 6 – 14.
19. Nnebue CC, Ilika AL, Uwakwe KA, Duru CB, Onah SK, Abu HO, Oguejiofor EO, Gbarage MT, Idoro SA. Feeding practices and determinants of the nutritional status of pupils in a public primary school in Aladinma Owerri, Nigeria. *International Journal*. 2016;4(1):12-18.
20. Tee L, Botha C, Jerling J. The intake and quality of breakfast consumption in adolescents attending public secondary schools in the North West province, South Africa. *South African Journal of Clinical Nutrition*. 2015 Jan 1;28(2):81-88.
21. Rodrigues PR, Pereira RA, Santana AM, Gama A, Carvalhal IM, Nogueira H, Rosado-Marques V, Padez C. Irregular breakfast habits are associated with children's increased adiposity and children's and parents' lifestyle-related behaviors: a population-based cross-sectional study. *Nutrire*. 2016 Dec;41(1):1-0.
22. Raaijmakers LG, Bessems KM, Kremers SP, van Assema P. Breakfast consumption among children and adolescents in the Netherlands. *European Journal of Public Health.* 2010 Jun 1;20(3):318-324.
23. Mahoney CR, Taylor HA, Kanarek RB, Samuel P. Effect of breakfast composition on cognitive processes in elementary school children. *Physiology and Behaviour.* 2005 Aug 7; 85(5): 635-645.
24. Katona P, Katona-Apte J. The interaction between nutrition and infection. *Clinical Infectious Diseases*. 2008 May 15; 46(10): 1582-1588.
25. Cole SZ, Lanham JS. Failure to thrive: an update. *American Family Physician.* 2011 Apr 1;83(7):829-834.
26. Jeong SJ. Nutritional approach to failure to thrive. *Korean Journal of Pediatrics*. 2011 Jul;54(7):277.
27. Uzogara SG. Underweight, the less discussed type of unhealthy weight and its implications: a review. *American Journal of Food Science and Nutrition Research*. 2016;3(5):12