OPEN ACCESS

PUCRS ESCOLA DE MEDICINA

SCIENTIA MEDICA

Scientia Medica Porto Alegre, v. 33, p. 1-10, jan.-dez. 2023
e-ISSN: 1980-6108 | ISSN-L: 1806-5562

http://dx.doi.org/10.15448/1980-6108.2023.1.44368

ORIGINAL ARTICLE

Assessment of anthropometric and physical profile of selected school-age children in rural and urban setting in South-West Nigeria (NigeriaLINX pilot)

Avaliação do perfil antropométrico e físico de crianças em idade escolar selecionadas em ambientes rurais e urbanos no sudoeste da Nigéria (piloto NigeriaLINX)

Grace Otinwa[1]
orcid.org/0000-0002-8983-8103
otinwago@yahoo.com

Boluwaji Gbenga Jaiyesimi[2]
orcid.org/0000-0003-0802-6865
jayesimibg@abuad.edu.ng

Toba Bamitale[2]
orcid.org/0000-0002-7238-1549
tobabamitale001@gmail.com

Habeeb Owolabi[1]
orcid.org/0000-0002-3767-7280
hablad@yahoo.com

Gbenga Ajibola[1]
orcid.org/0000-0001-8519-7532
samgbenga001@gmail.com

MacPherson Ogunsemore[1]
orcid.org/0000-0002-1298-2705
mogunsemore@unilag.edu.ng

Musiliu Owolewa[1]
orcid.org/0000-0003-3502-1672
owolewamusiliu@gmail.com

Received on: Feb. 20th, 2023.
Approved on: Jul. 11th, 2023.
Published on: Nov. 14th,2023.

Abstract

Objective: the objective of this study was to examine the anthropometric and physical profile of selected school-age children in rural and urban setting.

Methods: the descriptive cross-sectional design was adopted for the study while multistage sampling techniques, which included simple random and systematic sampling techniques, were used to draw samples from the target population. The sample constitute healthy children who voluntarily participated in the study after consent for participation was given by individual parent. Anthropometric measurements for the study included height, weight, sitting height and BMI while the physical fitness tests for the study included sit and reach, handgrip strength, speed bounce, standing broad jump, 10m x 5 shuttles run and multistage fitness test. Z score, STEN score and independent T-Test were used for data analysis.

Results: a total of 222 healthy children with average age of 10 years (male=112, female=109) participated in the study. The results showed that the urban children were taller (Urban=141.3±9.2m; Rural=134±21.3m), heavier (Urban=37.6±10.4kg; Rural=28.2±6.2kg), had more leg power (Urban=105.7±25.5; Rural=49.4±41.0) and arm strength (Urban=15.7±4.1; Rural=13.4±5.2) than rural children. However, the rural children had higher sit and reach score (Rural=25.3±5.8; Urban=22.8±6.0) and completed more laps in multistage fitness test (Rural=35.5±25.5; Urban=12±5.7). The statistical analysis showed that all the variables were significantly different urban and rural children ($P<0.05$).

Conclusion: the current study shows that the children in the urban and rural settings differed in the selected anthropometric and physical variables. Therefore, the physical education program and infrastructural facilities for physical activity and sport participation for school age children should be designed based on the socioeconomic status, social amenities and level of development of the host community.

Keywords: anthropometrics, physical profile, school-age children, urban, rural.

Resumo

Objetivo: examinar o perfil antropométrico e físico de crianças em idade escolar selecionadas em ambientes rurais e urbanos.

Métodos: foi realizado um estudo transversal aplicando técnicas de amostragem em vários estágios, que incluíam processos de amostragem aleatória simples e sistemática, usadas para extrair amostras da população-alvo. A amostra constitui-se de crianças saudáveis que participaram voluntariamente do estudo, após consentimento para participação dado por um dos pais. As medições antropométricas incluíram altura, peso, altura sentada e IMC, enquanto os testes de aptidão física para o estudo incluíram sentar-se e alcançar, força de preensão manual, salto de velocidade, salto em largura, corrida de vaivém de 10 x 5 metros e teste de aptidão multiestágio. Foram usados para a análise escore z, escore STEN e teste t independentemente dos dados.

[1] University of Lagos (UNILAG), Faculty of Education, Human kinetics and Health Education, Lagos, Lagos State, Nigeria.
[2] Afe Babalola University (ABUAD), College of Sciences, Sports Science Unit, Ado Ekiti, Ekiti State, Nigeria.

Resultados: um total de 222 crianças saudáveis com idade média de 10 anos (masculino=112, feminino=109) participaram do estudo. Os resultados mostraram que as crianças urbanas eram mais altas (Urbano=141,3±9,2m; Rurais=134±21,3m), mais pesadas (Urbano=37,6±10,4kg; Rurais=28,2±6,2kg), tinham mais força nas pernas (Urbano=105,7±25,5; Rurais =49,4±41,0) e força de braço (Urbano=15,7±4,1; Rural=13,4±5,2) do que as crianças da zona rural. No entanto, as crianças da zona rural tiveram maior pontuação de sentar e alcançar (Rural=25,3±5,8; Urbana=22,8±6,0) e completaram mais voltas no teste de condicionamento físico multiestágio (Rural=35,5±25,5; Urbana=12±5,7). Todas as variáveis eram significativamente diferentes entre crianças urbanas e rurais (P<0,05).

Conclusão: o presente estudo mostrou que as crianças das áreas urbana e rural diferiram nas variáveis antropométricas e físicas selecionadas. Portanto, o programa de educação física e as instalações de infraestrutura para atividades físicas e participação em esportes para crianças em idade escolar devem ser projetados com base no status socioeconômico, nas comodidades sociais e no nível de desenvolvimento da comunidade anfitriã.

Palavras-chave: antropometria, perfil físico, idade escola, população urbana, população rural.

Introduction

Children in 21st century are less active especially in urban areas (1). Children nowadays preferred to be more inactive when choosing activities such as eating and sleeping as their key activities (2). A study examining differences in physical activity, physical fitness, and overweight among rural and urban children shows that children from rural areas and small cities were more active than urban children (3). In children and adolescents, moderate- and vigorous-intensity physical activity are positively related to reaction time, executive attention and planning (4, 5, 6, 7). Moreover, better physical fitness in the school-age population is associated with better planning, working memory, cognitive flexibility, and inhibition (8). Furthermore, healthier body mass and body mass index (BMI) are associated with improved general cognitive performance and executive functions in the school-age population (9, 10).

The school has been identified as an important setting for promoting the health and well-being of children (11). For example, many school districts in the United States have built upon the required area to focus on meeting the needs of coordinated school health such as nutrition, health education, physical education, physical fitness, mental health, health and safe school environments amongst others (12). Many schools in Nigeria already have programmes that provide students with some physical fitness activities, however, emerging population trends for obesity suggest that children and youth need more physical activity that their current levels (13). Based on the background provided by previous research and given the scarcity of studies describing anthropometric and physical fitness profile of school-aged children in Nigeria, this study provided the anthropometric and physical fitness profile of selected school-age children in rural and urban setting in South-West Nigeria.

Materials and methods

A descriptive cross-sectional research design was adopted for the study. The multistage sampling techniques, which included simple random and systematic sampling techniques, were used to draw samples from the target population. The participants for the study were randomly drawn from two primary schools in the South-western region (rural and urban schools). A total of 222 healthy children with average age of 10 years (male=112, female=109 and prefer not to say=1) voluntarily participated in the study after consent for participation was given by individual parent. The respondents were treated in accordance with the Helsinki Declaration. Anthropometric measurements for the study included height, weight and sitting height. The height was measured to the nearest 0.1 cm using a fixed stadiometer. The weight was measured to the nearest 0.1 kg with a standard scale utilizing a portable balance. The sitting height was measured from the distance between the vertex of the cranium and the line connecting the tuberosities of the ischium.

According to WHO growth charts for Canadian children within 5 and 19 years, weight-for-age was classified into underweight (<3rd percentile) and severely underweight (<0.1st percentile). Height-for-age was classified as stunted (<3rd percentile) and severely stunted (<0.1st percentile). BMI-for-age was classified as wasted (<3rd percentile), severely wasted (<0.1st percentile), overweight (> 85th percentile), obese (>97th percentile), severely obese (>99.9th percentile) (14).

The physical fitness tests for the study included sit and reach, handgrip strength, speed bounce, standing broad jump, 10m x 5 shuttle run and multistage fitness test. The sit and reach test were measured with the sit and reach box. The measurement was taken with the child seated on the floor and using a standardized support, the maximum distance reached with the tip of the fingers by forward flexion of the trunk is measured. Test indicative of amplitude of movement or flexibility. The handgrip strength test was measured using a handgrip dynamometer (TKK 5001, grip A, Takei, Tokyo; range 0–100 kg; accuracy 0.5 kg). Children were standing in a bipedal position maintaining the arm of the tested side straight down with the shoulder slightly abducted (~10˚ not touching the rest of the body), the elbow in 0˚ flexion, and the forearm in neutral position and the wrist in 0˚ flexion. Each child performed the test twice alternately with both hands with 1 min rest between attempts using the same grip span (4.0 cm). The best value of two trials for each hand was chosen, and the average of both hands was registered (kg).

The standing broad jump was measured with the children stood behind the starting line and instructed to push off vigorously and jump as far as possible. The children had to land with the feet together and to stay upright. The test was repeated twice, and the best score was retained. The 10×5meters shuttle run involved five shuttle runs as fast as possible between two lines 10 meters apart. At each end, participant touched the line with the leg and quickly return to the other line. The multistage fitness test involved running in small groups, back and forth between two lines placed 20m apart. The running pace was determined by an audio signal from a pre-recorded audio file played on a multimedia device. The children were instructed to keep pace with the audio signal so that they completed the 20m running distance between signals. The signals started at a rate designed to give running speed 8. 5km.h^{-1}, this increased by 0. 5km.h^{-1} every minute so that it became increasingly hard to maintain the required pace. The children were encouraged to complete as many stages as possible. Each one of them was eliminated at a point that could no longer complete the 20m run.

All the analyses were performed using the IBM SPSS Statistics 25, and values of $p < 0.05$ were considered statistically significant. Frequency, percent, mean, standard deviation, Standard Ten (STEN) score and independent T-Test were used to analyse the collected data for the study. The STEN score was calculated using STEN score = (z-score × 2) + 5.5 (15).

Results

TABLE 1 – Descriptive statistics of the anthropometric and physical variables.

	All (n=222)	Urban (123)	Rural (n=99)	P Value
Anthropometric variables				
Age, year	10.2±1.6	10.1±1.9	10.4±1.2	0.001*
Height, cm	138±16.2	141.3±9.2	134±21.3	0.000*
Sitting Height, cm	76.6±13.1	70.6±4.8	84.1±16	0.000*
Weight, kg	33.4±10	37.6±10.4	28.2±6.2	0.000*
Physical variables				
Sit and Reach, cm	23.9±6	22.8±6.0	25.3±5.8	0.003*
Standing Broad Jump, cm	80.6±43.4	105.7±25.5	49.4±41.0	0.000*
Handgrip, kg	14.5±4.8	15.7±4.1	13.4±5.2	0.000*
10m x 5 Shuttle Run, sec	19.2±4.8	16.5±2.9	22.6±4.6	0.000*
Speed Bounce, no	18.1±10.7	25.1±8.4	9.5±6.1	0.000*
Multistage Fitness Test, laps	22.5±21.1	12±5.7	35.5±25.5	0.000*

* Independent T-Test

Table 1 comprises the descriptive statistics result of the anthropometric (age, height, sitting height and weight) and physical variables (sit and reach, standing broad jump, handgrip, 10m x 5 shuttle run, speed bounce and multistage fitness test) between children in urban and rural areas. The table 1 shows that children from the rural area are slightly older, while the children from the urban are taller. The sitting height result shows that the rural children had more tendency for peak height velocity than the urban children. The result also shows that urban children has more weight than rural children.

According to Table 1 on physical variables, sit and reach test result shows that rural children had more upper trunk flexibility than the urban children. In addition, rural children also performed better in 10m x 5 Shuttle Run and multistage fitness test. However, the urban children performed better standing broad jump, handgrip strength test and speed bounce. The STEN scores showed that weight has the least score among the anthropometric variables for all the children while height has the highest score (**Figure 1**). In the category for the physical variables, the handgrip test score ranked the lowest while the standing broad jump test ranked the highest from all the children score (**Figure 2**). The urban and rural children also follow the same order of ranking of anthropometric variables (**Figure 1**). However, the urban children had the least ranked score in multistage fitness test and highest ranked score in standing broad jump while the rural children had the least ranked score in speed bounce and the highest ranked score in standing broad jump (**Figure 2**).

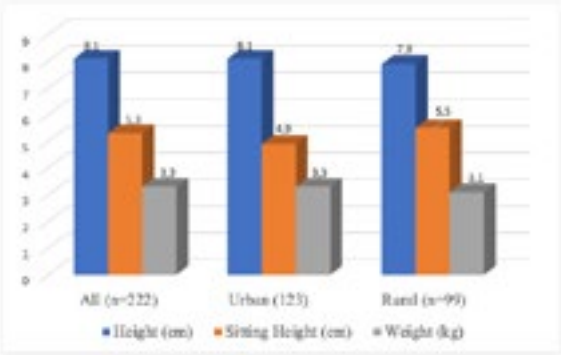

Figure 1. Bar chart for STEN scores of the anthropometric variables.

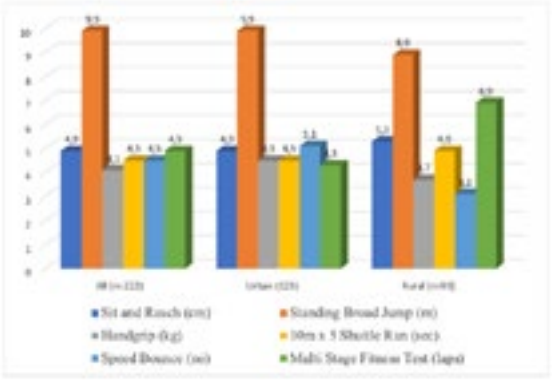

Figure 2. Bar chart for STEN scores of physical variables.

The scatterplot comparative results between the current study and WHO growth chart for the Canadian children showed that in male height-for--age the urban children clustered within 25th and 90th percentiles (**Figure 3A**) while the rural children clustered within 3rd and 50th percentiles (**Figure 3B**). As for the male weight-for-age, the urban children clustered within 10th and 97th percentiles (**Figure 3A**) while the rural children 3rd and 97th percentiles (**Figure 3B**). As for the male BMI, the urban children clustered within 10th and 99.9th percentiles (**Figure 4A**) while the rural children clustered within 3rd and 75th percentiles (**Figure 4B**).

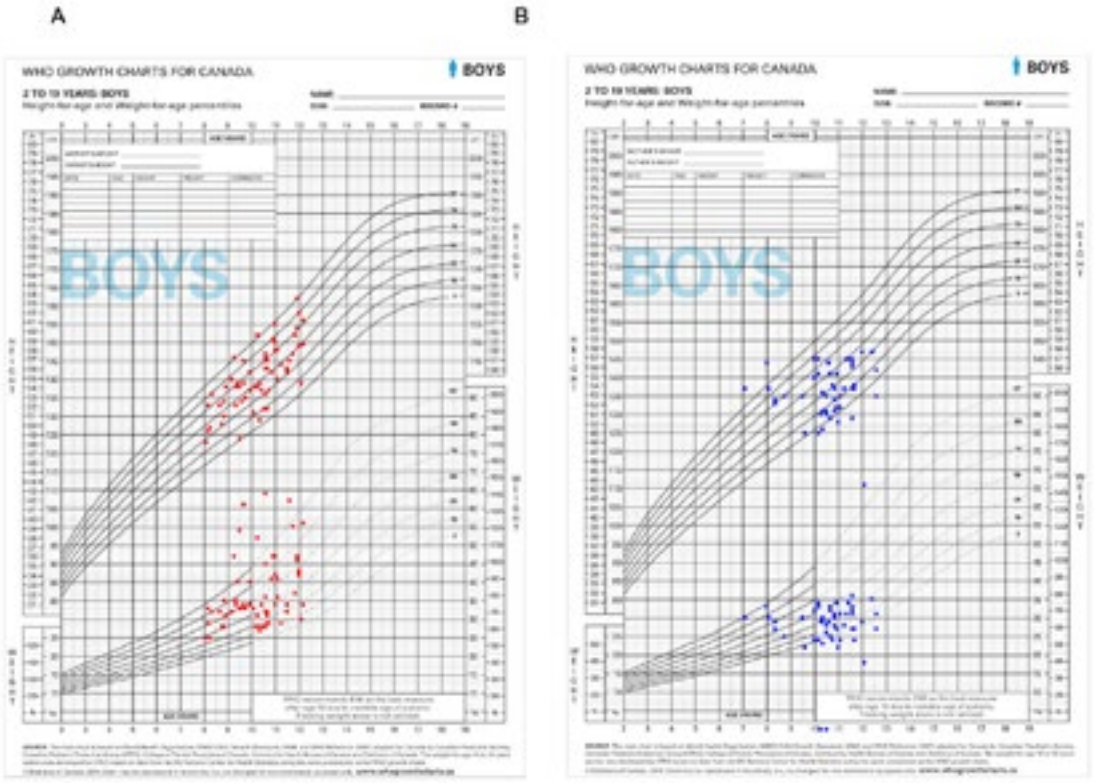

Figure 3. Height-for-age and weight for age percentiles: a) chart for urban male; b) chart for rural male.

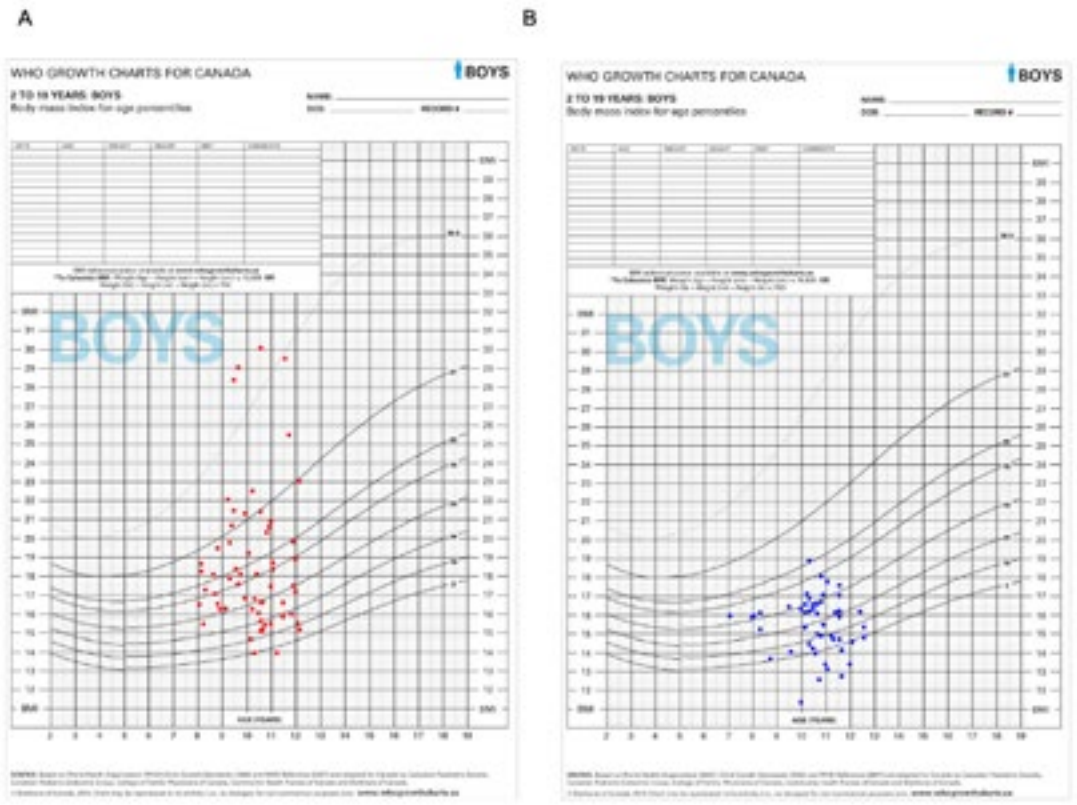

Figure 4. Body mass index for age percentiles: a) chart for urban male; b) chart for rural male.

Considering the female height-for-age the urban children clustered within 10th and 97th percentiles **(Figure 5A**) while the rural children clustered within 3rd and 97th percentiles (**Figure 5B**). As for

the female weight-for-age, the urban children clustered within 10th and 97th percentiles (**Figure 5A**) while the rural children 3rd and 90th percentiles (**Figure 5B**). As for the female BMI, the urban children clustered within 10th and 99.9th percentiles (**Figure 6A**) while the rural children clustered within 3rd and 75th percentiles (**Figure 6B**). The independent T-test result on the anthropometric and physical variable differences between urban and rural children showed significant differences for all the variables ($p<0.05$).

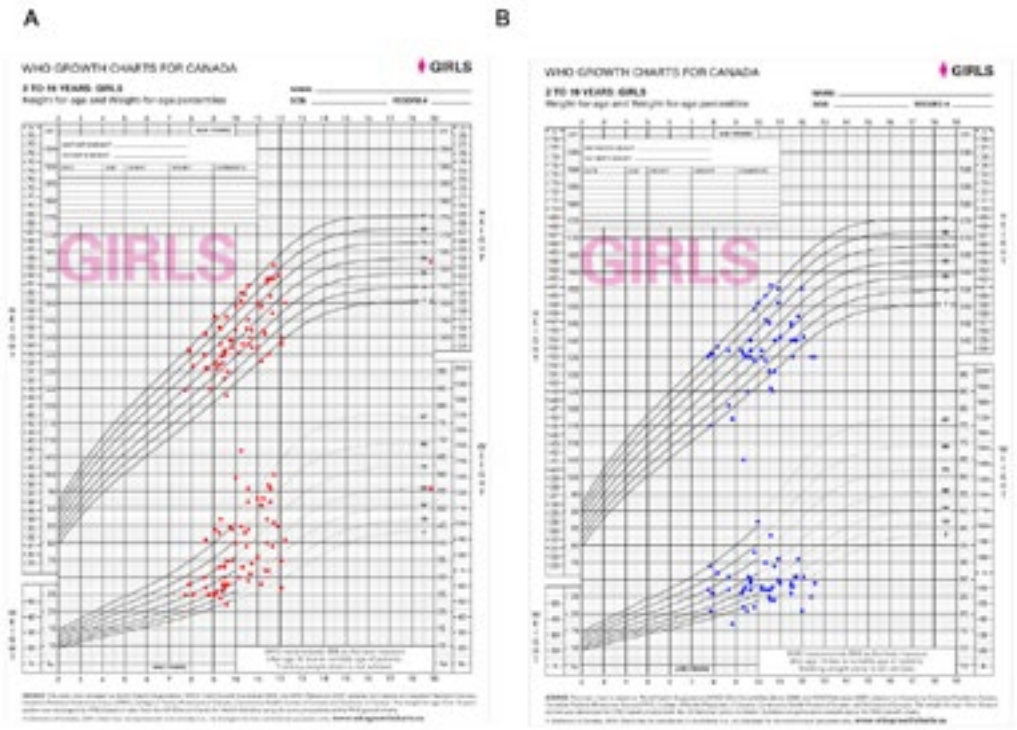

Figure 5. Height for age and weight for age percentiles: a) chart for urban female; b) chart for rural female.

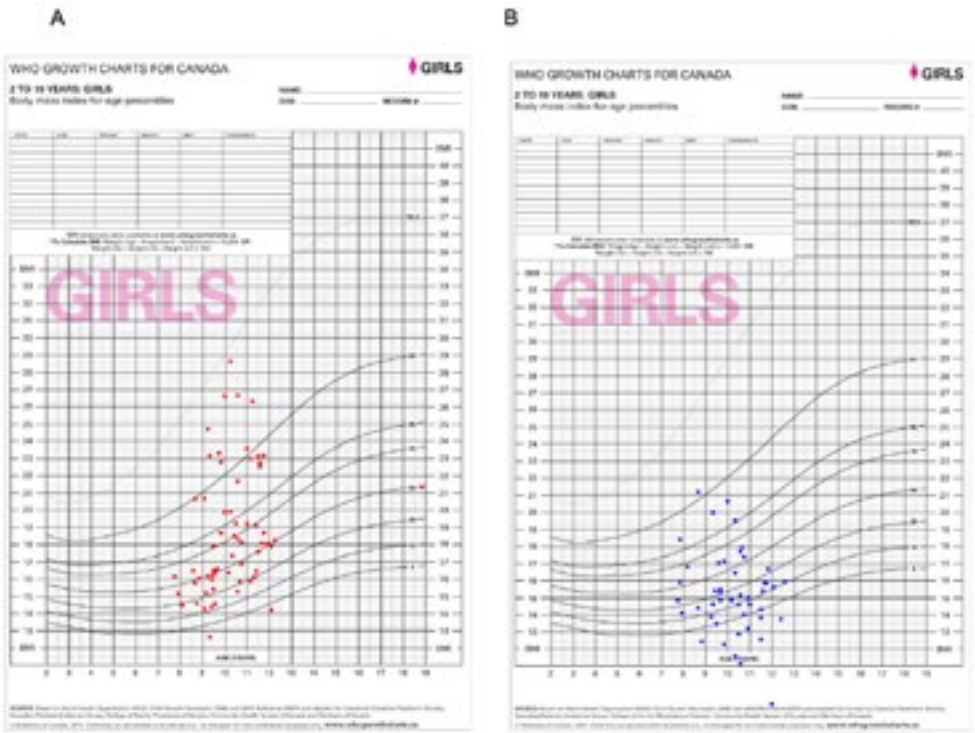

Figure 6. Body mass index for age percentiles: a) chart for urban female; b) chart for rural female.

Discussion

The purpose of this study was to investigate the anthropometric and physical profile of children from the urban and rural setting. With respect to the result of the descriptive statistics the anthropometric and physical variables between children in urban and rural areas indicated that children from the rural area are slightly older while the children from the urban are taller, sitting height of the rural children had more tendency for peak height velocity than the urban children and the urban children had more weight than rural children. A study reported also reported that urban children have a larger physical size compared to rural children because of distinctive lifestyle, differences in ethnic and social background (16). When compared to their urban counterparts, Vietnamese rural children had higher heights and a lower BMI (17). This report is also in line with a study carried out in India (18). The results of this study are similar to other studies on children conducted in other nations. It has been discovered that children from the urban area in Hungary, Brazil, Spain, Greece, and Mexico are taller and heavier than their rural areas (19, 20). Indian punjabi children were reported to have larger height and body weight than rural Indian males and urban Bengalese boys (20, 21) unlike the Kerala boys (23) and Greek children (20). However, a study reported no anthropometric disparities between rural and urban children (24).

Furthermore, the result of the physical variables indicating that the sit and reach test of the rural children had more upper trunk flexibility with the rural children performing better in 10m x 5 Shuttle Run and multi stage fitness test while the urban children performed better standing broad jump, handgrip strength test and speed bounce. The findings indicated that children in both rural and urban area participates in physical activities. A study reported that indigenous children participate in more physical activities than youngsters in metropolitan areas (3). The independent t-test result on the anthropometric and physical variable differences between urban and rural children showed significant differences for all the variables. The current study agreed with a study (25) that reported that urban children's BMI is higher than children from the rural area because they participate in fewer athletic activities.

It was reported in a study that Children from the rural area were not overweight or obese, and their BMI, waist circumference, and triceps skinfold were all lower than those of urban children (26). In Turkey, children in metropolitan areas had a higher BMI and skinfold thickness (26, 27, 28). In Oman, urban youngsters had a greater body fat percentage and a higher BMI than their rural areas (25). On the other hand, multiple studies have found that urban children had better fat mass and physical fitness than rural children (24, 25, 26). These disparities in prior research findings demonstrate the impact of urban and rural lifestyle on children's physical fitness and anthropometric parameters.

Conclusion and Recommendations

The current study shows that the children in the urban and rural settings differed in the selected anthropometric and physical variables. These differences are heterogeneous in research results across different countries, depending on socioeconomic status, social amenities, and the level of development of the host community. Therefore, physical activities should be planned according to these three parameters to achieve optimized results. The pattern of variation would help in designing intervention that will enhance the developmental and performance results. Even though the children are still at the physical discovery stage, intentional nutritional support through school health programs will aid their anthropometric status. The ranked physical variables revealed the need for a more inclusive approach in physical education programs at the rural and urban regions. The program would be more beneficial if it is domain specific. Therefore, the physical education program and infrastructural facilities for physical activity and sport participation for school age children should be designed based on the socioeconomic status, social amenities, and level of development of the host community.

Notes

This study was presented at the International Council of Physical, Health Education, Recreation and Dance, October 2022, Kenya.

We acknowledge the input (LINX project design) of Gareth Stratton and Nils Swindel of the University of Swansea for their supports and guidance on the LINX project worldwide.

Funding

This study receives financial support from Global Challenge Research Fund.

Conflicts of interest disclosure

The authors declare no competing interests relevant to the content of this study.

Authors' contributions

All the authors declare to have made substantial contributions to the conception, or design, or acquisition, or analysis, or interpretation of data; and drafting the work or revising it critically for important intellectual content; and to approve the version to be published.

Availability of data and responsibility for the results

All the authors declare to have had full access to the available data and they assume full responsibility for the integrity of these results.

References

1. Hian TC, Mahmud ZF, Choong TY. Physical fitness level between urban and rural students-case study. Procedia - Soc Behav Sci. 2013;90:847-52. https://doi.org/10.1016/j.sbspro.2013.07.160

2. Dollman J, Norton K, Norton L. Evidence for secular trends in children's physical activity behaviour. Br J Sports Med. 2005;39:892-7. http://dx.doi.org/10.1136/bjsm.2004.016675

3. Joens-Matre R, Welk G, Calabro M, Russell D, Nicklay E, Hensley L. Rural–urban differences in physical activity, physical fitness, and overweight prevalence of children. J Rural Health 2008;24(1):49-54. https://doi.org/10.1111/j.1748-0361.2008.00136.x

4. Booth JN, Tomporowski PD, Boyle JM, Ness AR, Joinson C, Leary SD, Reilly JJ. Associations between executive attention and objectively measured physical activity in adolescence: Findings from ALSPAC, a UK cohort. Mental Health Phys. Activ. 2013;6(3):212-9. https://doi.org/10.1016/j.mhpa.2013.09.002

5. Syväoja HJ, Tammelin TH, Ahonen T, Kankaanpää A, Kantomaa MT. The associations of objectively measured physical activity and sedentary time with cognitive functions in school-aged children. PloS one. 2014;9(7):e103559. https://doi.org/10.1371/journal.pone.0103559

6. Hsieh SS, Fung D, Tsai H, Chang YK, Huang CJ, Hung TM. Differences in working memory as a function of physical activity in children. Neuropsychology. 2018 Oct;32(7):797. https://doi.org/10.1037/neu0000473

7. Mala J, McGarry J, Riley KE, Lee EC, DiStefano L. The relationship between physical activity and executive functions among youth in low-income urban schools in the northeast and southwest United States. J Sport Exerc Psychol. 2020;42(4):292-306. https://doi.org/10.1123/jsep.2019-0111

8. Mora-Gonzalez J, Esteban-Cornejo I, Cadenas-Sanchez C, Migueles JH, Molina-Garcia P, Rodriguez-Ayllon M, *et al*. Physical fitness, physical activity, and the executive function in children with overweight and obesity. J Pediatr. 2019;208:50-6. https://doi.org/10.1016/j.jpeds.2018.12.028

9. Li N, Yolton K, Lanphear BP, Chen A, Kalkwarf HJ, Braun JM. Impact of early-life weight status on cognitive abilities in children. Obesity (Silver Spring). 201;26(6):1088-95. https://doi.org/10.1002/oby.22192

10. Wood AC, Vainik U, Engelhardt LE, Briley DA, Grotzinger AD, Church JA, *et al*. Genetic overlap between executive functions and BMI in childhood. Am J Clin Nutr. 2019;110(4):814-22. https://doi.org/10.1093/ajcn/nqz109

11. John-Akinola YO, Gavin A, O'Higgins SE, Gabhainn SN. Taking part in school life: views of children. Health Educ. 2014;114(1):20-42. https://doi.org/10.1108/HE-02-2013-0007

12. Joronen K, Rankin SH, Åstedt-Kurki P. School-based drama interventions in health promotion for children and adolescents: systematic review. J Adv Nur. 2008l;63(2):116-31. https://doi.org/10.1111/j.1365-2648.2008.04634.x

13. Emeahara GO, Umeifekwem J. Creating school's environment and policies to promote physical activities for obesity prevention among school children in Nigeria. J Niger Assoc Sport Sci Med. 2014;15(2):50–7.

14. World Health Organization [Internet]. [please unkmown]; [updated Mar 2014]. Who growth charts for Canada; 1-14. Available from: https://cpeg-gcep.net/content/who-growth-charts-canada

15. McGuigan M. Monitoring training and performance in athletes. Human Kinetics; Champaign, IL. 2017 Mar 10.

16. Aziz S, Ain WN, Majeed R, Khan MA, Qayum I, Ahmed I, *et al*. Growth centile charts (anthropometric measurement) of Pakistani pediatric population. J Pak Med Assoc. 2012;62(4):367.

17. Van Dang C, Day R, Selwyn B, Maldonado YM, Nguyen KC, Le TD, *et al*. Initiating BMI prevalence studies in Vietnamese children: changes in a transitional economy. Asia Pac J Clin Nutr. 2010;19(2):209-16. https://search.informit.org/doi/10.3316/informit.146474768674731

18. Kolekar SM, Sawant SU. Study on physical growth in urban and rural school children from 5 to 13 years of age: a comparative approach. New Visions in Science and Technology. 2021;2:96-102. https://doi.org/10.9734/bpi/nvst/v2/12919D

19. Chillon P, Ortega FB, Ferrando JA, Casajus JA. Physical fitness in rural and urban children and adolescents from Spain. J Sci Med Sport. 2011;14(5):417-23. https://doi.org/10.1016/j.jsams.2011.04.004

20. Tambalis KD, Panagiotakos DB, Sidossis LS. Greek children living in rural areas are heavier but fitter compared to their urban counterparts: a comparative, time-series (1997-2008) analysis. J Rural Health. 2011;27(3):270-7. https://doi.org/10.1111/j.1748-0361.2010.00346.x

21. Mukhopadhyay A, Bhadra M, Bose K. Physical exercise, body mass index, subcutaneous adiposity and body composition among Bengalee boys aged 10-17 years of Kolkata, India. Anthropol Anz. 2005;63(1):93-101.

22. Venkaiah K, Damayanti K, Nayak MU, Vijayaraghavan K. Diet and nutritional status of rural adolescents in India. Eur J Clin Nutr. 2002;56(11):1119-25. https://doi.org/10.1038/sj.ejcn.1601457

23. Ramachandran A, Deol NS, Gill M. Assessment of body mass index and health related fitness among school children. J. Phys. Educ. Sport. 2009;25(4):1-6.

24. Aberle N, Blekić M, Ivaniš A, Pavlović I. The comparison of anthropometrical parameters of the four-year-old children in the urban and rural Slavonia, Croatia, 1985 and 2005. Coll Antropol. 2009;33(2):347-51.

25. Albarwani D Phil S, Al-Hashmi K, Al-Abri M, Jaju D, Hassan MO. Effects of overweight and leisure-time activities on aerobic fitness in urban and rural adolescents. Metab Syndr Relat Disord. 2009;7(4):369-74. https://doi.org/10.1089/met.2008.0052

26. Adamo KB, Sheel AW, Onywera V, Waudo J, Boit M, Tremblay MS. Child obesity and fitness levels among Kenyan and Canadian children from urban and rural environments: a KIDS-CAN Research Alliance Study. Int J Pediatr Obes. 2010;6(sup3):e225-232. https://doi.org/10.3109/17477166.2010.543683

27. Özdirenç M, Özcan A, Akin F, Gelecek N. Physical fitness in rural children compared with urban children in Turkey. Pediatr Int. 2005;47(1):26-31. https://doi.org/10.1111/j.1442-200x.2004.02008.x

28. Tinazci C, Emiroglu O. Physical fitness of rural children compared with urban children in north Cyprus: a normative study. J Phys Act Health. 2009;6(1):88-92. https://doi.org/10.1123/jpah.6.1.88

29. Tınazcı C, Emİroğlu O. Assessment of physical fitness levels, gender and age differences of rural and urban elementary school children. Türkiye Klinikleri tıp Bilimleri Dergisi. 2010;30(1):1-7.

30. Jiang Q, Huang X, Cui D. Rural–Urban Differences in physical fitness and overweight prevalence of children and adolescents from central south China. Int J Environ Res Public Health. 2023;20(3):2390. https://doi.org/10.3390/ijerph20032390

31. Dohbobga MN, Atabonglefac BF. The effect of nutritional status on the physical aptitude and cardiovascular profiles of school children in urban and rural areas of the center region of Cameroon. Scholastic [Internet] [Cited 2023 July 4]. 2023;2(1):36-47. Available from: http://univerpubl.com/index.php/scholastic/article/view/174

32. Kryeziu AR, Iseni A. Differences between children anthropometric and physical fitness characteristics urban and rural areas. Sports Science and Health. 2022;24(2):120-6. https://doi.org/10.7251/SSH2202120K

Grace Otinwa

Ph.D from University of Ibadan. Professor of Human Kinetics in the Faculty of Education, University of Lagos, Akoka, Lagos. Head of Department of Human Kinetics & Health Education (2010-2012 & 2013-2016). Vice President of the International Council for Health, Physical Education, Recreation, Sports and Dance (2015-till date).

Boluwaji Gbenga Jaiyesimi

Ph.D in Sports Science/Sports Biomechanics from Stellenbosch University, South Africa. M.Ed in Human Kinetics and Health Education (Exercise Physiology specialization); B.Ed in Human Kinetics and Health Education from University of Ibadan. He is Deputy Director of Sports, Afe Babalola University. Associate Professor of Sports Science in the College of Sciences, Afe Babalola University.

Toba Bamitale

Ph.D, M.Ed, B.Ed in Human Kinetics and Health Education, Department of Human Kinetics and Health Education, University of Ibadan, Nigeria. Associate Professor, Sports Science Programme Coordinator, Afe Babalola University, Ado Ekiti, Nigeria.

Habeeb Owolabi

Ph.D. in Health Education from the University of Lagos (UNILAG), in Akoka, Lagos State, Nigeria. Lecurer II at the Department of Human Kinetics and Health Education, Lagos State University of Education (LASUED), in Otto/Ijanikin, Lagos State, Nigeria.

Gbenga Ajibola

Ph.D. in Sports Administration and Management from the University of Lagos, Akoka-Yaba, Lagos, Nigeria; Master's degree in Sports Administration and Management from the same University; B.Sc. (Edu.) in Physical Education from the University of Benin; Edo State and National Certificate of Education from Adeniran Ogunsanya College of Education, Lagos State. Member and has served on the board of several professional associations, including ICHPER.SD, NAPHER.SD, NIM, NSSM, etc.; currently work as a lecturer in Human Kinetics and Health Education at the University of Lagos.

MacPherson Ogunsemore

Ph.D in Sports Administration and Management from the University of Lagos, Akoka-Yaba, Lagos Nigeria; M.Ed with specialisation in Sports Administration and Management from the University of Lagos Akoka-Yaba, Lagos Nigeria. Associate Professor at the Department of Human Kinetics and Health Education, Faculty of Education University of Lagos, Akoka-Yaba, Lagos-Nigeria.

Musiliu Owolewa

NCE - Physical and Health Education with specialization in Education for the Hearing impaired children - Federal College of Education (Special) Oyo State; B.Sc. Edu in Health Education - University of Ilorin, Kwara State; M.Ed in Health Education - University of Ibadan, Oyo State; Ph. D in view - University of Lagos, Nigeria.

Mailing Address

Boluwaji Gbenga Jaiyesimi

Afe Babalola University

Ado Ekiti, Ekiti State, Nigeria, 32601

Os textos deste artigo foram revisados pela SK Revisões Acadêmicas e submetidos para validação do(s) autor(es) antes da publicação.