Screen Time Usage and Physical Activity Levels Among Preschool Children in Lagos State: Implications for Health and Well-being

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Abstract: The purpose of this study was to find the relationship between physical activity levels and screen time usage of preschool children. Descriptive survey research design was employed for the study. The components measures were height, heart rate, Body Mass Index (BMI) and Blood pressure of the children after getting consents from parents. The population for the study comprised of preschool children between 3-5. The sample of the study consisted of 133 preschool children were purposely selected using multistage sampling technique. The procedure and methods used for the study was approved by the Departmental Postgraduate Committee before carrying out the experiment The research instruments for the study included International Physical Activity Questionnaire (iPAQ) and other calibrated instruments were used for data collection. Data from the study conducted was analyzed using the descriptive survey design of mean with graphical illustration while the hypotheses were tested using correlation coefficient at a 0.05 level of significance. Findings indicated that there was a negative significant relationship between the physical activity levels and screen time usage of preschool children; a positive significant relationship between the sedentary behavior and screen time usage of preschool children and a negative significant relationship between sleep pattern and screen time usage of preschool children. The findings of this study can contribute to the formulation of public health guidelines and recommendations aimed at promoting the optimal physical and mental development of preschool children. This information can be used by health practitioners, educators, policymakers, and parents to create strategies that encourage a balanced lifestyle that includes both physical activity and controlled screen time.

Keywords: preschool children, sedentary behavior, screen time, sleep pattern, physical activity.

INTRODUCTION

Early childhood development is a critical period for cognitive, social, and motor skill development. Engaging in regular physical activities during this period has been linked to enhanced cardiovascular health, motor skills development, and cognitive function. However, as the prevalence of screen time continues to rise, concerns have emerged regarding its potential displacement of physical activity among preschool children. The interplay between physical activity levels and screen time usage in preschool children is a complex and multifaceted phenomenon. Although research has investigated the impact of each factor independently, there remains a paucity of comprehensive studies that elucidate the interactive effects and potential trade-offs between these two behaviors. Modeled after the Canadian Report, the Nigerian Report Card showed that 90.9 percent of Nigerian children and youth in the urban and rural areas spend over three hours on screen time daily. Television viewing is 90.7 percent. The consequences of the impact would be that many Nigerians will be at risk of NCDs, such as obesity, hypertension, e.t.c due to decreased physical activity, among others (Chioma, 2014). High screen time usage has been associated with sedentary behaviors, reduced physical activity, and adverse health outcomes, such as obesity and developmental delays, LeBlanc, A. G., Spence, J. C., Carson, V., & Connor, G. S. (2012). Similarly, Chaput, Saunders, Mathieu, and Tremblay, (2014) and Carson, Hunter, Kuzik, Wiebe, Spence, Friedman...and Tremblay, (2016) noted that high screen time usage has been associated with sedentary behavior, increased risk of obesity, decreased physical activity levels, and altered sleep patterns.

According to Otinwa, Abass, Oladipo, Onwuama and Adewunmi, (2016) the challenges associated with getting children active every day should be met with age-appropriate physical activities, enthusiastic leadership, and support from family and friends. Conversely, physical activity is a fundamental component of children's healthy growth and development. Engaging in regular physical activities during early childhood has been linked to enhanced cardiovascular health, motor skills development, and cognitive function (Awopetu, Esan, Adebero & Adeola, (2018); Otinwa, Esan, & Amuzie, 2022).

The researcher observed that children within the age of 0-5years are usually pacified with electronic gadgets (such as tablets, mobile phones, Tv) to watch cartoons like cocomelon, pj mask, Thomas and friends e.t.c. to keep calm, eat and sleep. In the early years, this age group engage more in "crawling around the house", "pushing their walker", "building legos", "role play with dolls and sand", "football", to mention a few to keep them active. Parents and Guardians have contributed this effect by placing gadgets before the children when they want to get their own work done rather than engaging the children in physical activities with their peer group.

Methods and Procedures
The population of this study consisted of 200 preschool children in two Lagos Mainland Local Government Area using a purposive sampling technique. A total of 133 were randomly selected to get the sample size, using Yahame Sample Formula. Preschool children aged 3 to 5 years for both male and female participants. A descriptive survey design was used in carrying out the study. Informed consent form was obtained from the ministry of education, schools, guardian and parents.
The following research instruments were used in this study: Stadiometer (for height), Heart rate monitor (for resting heart rate), weighing scale (for weight) and Modified iPAQ (to measure the screen time usage), Accelerometer (for Physical Activity Levels: An accelerometer is a sensor used to measure acceleration or changes in velocity of an object), informed consent form (parents, guardian, school). The internal consistency and reliability of the standardized instruments used for the research was determined through a test re-test method by exposing the child/parent to five (5) days of wearing the accelerometers around their hips and the iPAQ parent questionnaires. The data gotten was subjected to Pearson coefficient Statistical Analysis reliability. The reliability of the instrument was .85

Results
Table 1 presents the physical characteristics. The results show that girls were more in population than boys. However, girls were slightly taller, heavier and had a greater mean BMI than boys.
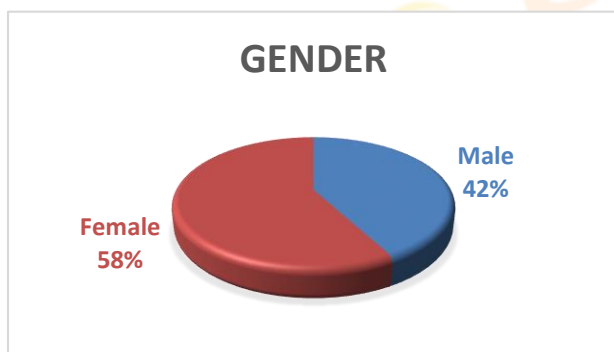
Gender	Frequency (N)	Percentage (%)
Male	56	42.1
Female	77	57.9
Total	133	100.0

Fig.1.0: Pie chart on preschooler's gender

Table 1.1: Height and Weight of the Preschoolers

Demographic Data	Mean (N)
Height (Male)	1.07(m)
Height (Female)	1.10(m)
Weight (Male)	13(kg)
Weight (Female)	20(kg)
BMI (Male)	15(kg/m^2)
BMI (Female)	17(kg/m^2)

Table 1.1 above shows the mean height and weight of the preschoolers.

Table 2 represents the correlation Analysis of the relationship between the physical activity levels and screen time usage of preschool children in Lagos State. The result shows that there was no significant relationship between physical activity, sleep pattern and screentime usage in preschool children but there was a significant relationship between the sedentary behavior and screentime usage of preschoolers in Lagos state.

Table 2.0: paired correlation Analysis of the relationship between the physical activity levels and screen time usage of preschool children in Lagos State.

	Correlation	PHYSICAL ACTIVITY LEVEL	SCREEN TIME USAGE
PHYSICAL ACTIVITY LEVELS	Pearson Correlation	1	-.987
	Sig. (2-tailed)		0.000
	N	133	133
SCREEN TIME USAGE	Pearson Correlation	-.987	1
	Sig. (2-tailed)	.000	
	N	133	133

Correlation is significant at the 0.05 level (2-tailed).

Table 2.0 shows the relationship between the physical activity levels and screen time usage of preschool children in Lagos State. When the 0.000 value is compared to the 0.05 level of significance, the result ($r = -0.987$; $p \ 0.05$) reveals a significant negative relationship between the physical activity levels and screen time usage of preschool children in Lagos State. Meaning as the physical activity level increases, screen time usage decreases and vice versa.

Table 2.1: Analysis of the relationship between the sedentary behaviour and screen time usage of preschool children in Lagos State

	Correlation	SEDENTARY BEHAVIOUR	SCREENTIME USAGE
SEDENTARY BEHAVIOUR	Pearson Correlation	1	.761
	Sig. (2-tailed)		0.000
	N	133	133
SCREENTIME USAGE	Pearson Correlation	.761	1
	Sig. (2-tailed)	.000	
	N	133	133

**. Correlation is significant at the 0.05 level (2-tailed).

Table 2.1 of the paper shows the relationship between the sedentary behaviour and screen time usage of preschool children in Lagos State. The correlation between the sedentary behaviour and screen time usage of preschool children in Lagos State is positively significant ($r = 0.761$; $p \ 0.05$) when the 0.000 value is contrasted with the 0.05 level of significance. This means that as screentime usage increase, sedentary behaviour increases.

Table 2.2: Analysis of the relationship between sleep pattern and screen time usage of preschool children in Lagos State.

	Correlation	SLEEP PATTERN	SCREENTIME USAGE
SLEEP PATTERN	Pearson Correlation	1	-.649
	Sig. (2-tailed)		.000
	N	133	133
SCREENTIME USAGE	Pearson Correlation	-.649	1
	Sig. (2-tailed)	.000	
	N	133	133

**. Correlation is significant at the 0.05 level (2-tailed).

Table 2.2 shows the relationship between sleep pattern and screen time usage of preschool children in Lagos State. When the 0.000 value is compared to the 0.05 level of significance, the result ($r = -0.649$; $p \ 0.05$) reveals a significant negative relationship between sleep pattern and screen time usage of preschool children in Lagos State. This means that as the sleep patter increase, screen time usage decreases.

Discussion of Findings

The first finding of the study revealed that there is significant negative relationship between the physical activity levels and screen time usage of preschool children in Lagos State. Inverse Relationship: Many studies have found an inverse relationship between the amount of time preschool children spend in front of screens (such as TV, tablets, and smartphones) and their level of physical activity. This means that as screen time increases, physical activity tends to decrease. For example, a study by Hinkley et al. (2012) found that each additional hour of screen time was associated with a significant reduction in physical activity in preschool children.

The second finding noted that there is significant positive relationship between the sedentary behaviour and screen time usage of preschool children in Lagos State. Excessive screen time is often linked to increased sedentary behavior in preschoolers. Sedentary behavior refers to activities that require minimal physical effort, such as watching television or playing video games. This sedentary time can displace active playtime and have negative effects on physical health. A study by Carson, V., Clark, D., Ogden, N., Harber, V., & Kuzik, N., (2015) found that sedentary behavior was associated with screen time in preschool children. Research has

consistently shown a positive correlation between high screen time usage and increased sedentary behavior among preschool children, ages 2-5. High levels of screen time in preschoolers have been linked to an increased risk of obesity and overweight, likely due to reduced physical activity levels and disrupted sleep patterns, Chaput, J. P., Visby, T., Nyby, S., Klingenberg, L., Gregersen, N. T., Tremblay, A., ... & Astrup, A., (2011). Excessive screen time has been associated with negative effects on cognitive development in preschool children, including reduced attention span and poorer executive functioning (American Academy of Pediatrics, 2016).

The last finding of the study revealed that there is significant negative relationship between sleep pattern and screen time usage of preschool children in Lagos State. Several studies have found that increased screen time, especially in the hour before bedtime, is associated with reduced sleep duration in preschool children, Mindell, J. A., Leichman, E. S., DuMond, C., & Sadeh, A., (2015). For example, a study by Garrison, M. M., Christakis, D. A., Chriqui, J. F., & Liekweg, K., (2018) reported that each additional hour of screen time was associated with a 15-minute decrease in total sleep duration in preschoolers. Excessive screen time can lead to delayed bedtime in preschool children. Exposure to screens with stimulating content can interfere with the natural bedtime routine (Hale & Guan, 2015). Owens, J. A., Mindell, J. A., & the American Academy of Pediatrics, (2015) found that greater screen time in the evening was associated with later bedtime and shorter sleep duration in young children. Excessive screen time can also negatively impact the quality of sleep. The content children consume on screens, such as violent or exciting media, may lead to nightmares or disturbed sleep Chassiakos, Y. R., Radesky, J., Christakis, D., Moreno, M. A., Cross, C., & Council on Communications and Media, (2016). Screen time, particularly on handheld devices in the bedroom, has been linked to more frequent night waking in preschool-aged children LeBourgeois, M. K., Hale, L., Chang, A. M., Akacem, L. D., Montgomery-Downs, H. E., & Buxton, O. M., (2017).

Conclusion and Recommendation

Data on the variable under research were gathered using a standardized questionnaire. Sections A and B made up the questionnaire. Whereas section B contained items created to extract replies based on the study variables, section A was used to collect information on the respondents' personal information.

One hundred and thirty-three (133) questionnaires were distributed in total. On the spot, the questionnaire was gathered. The descriptive statistics of frequency counts, percentages, mean and pie-charts were used for the demographic data while an inferential statistics of Pearson correlation coefficient at 0.05 alpha level was used to test the hypotheses. Considering the above findings and conclusions, the following recommendations were suggested by the researcher:

Encourage preschool children to engage in at least 60 minutes of moderate-to-vigorous physical activity (MVPA) daily. Limit screen time to no more than two hours per day, including television, video games, and computer use. Encourage non-screen activities, such as reading, playing with toys, and spending time with family and friends. Encourage movement breaks throughout the day, such as standing up and stretching every 30 minutes. Replace sedentary activities with more active options, such as walking or biking instead of taking the car for short trips. Set regular sleep and wake times for preschool children, even on weekends. Create a relaxing bedtime routine, such as taking a warm bath, reading a story, and avoiding screen time before bed.

References
1. American Academy of Pediatrics. (2016). Media use in school-aged children and adolescents. *Pediatrics*, 138(5), 2016-2592.
2. Awopetu, A.R., Esan, J.A., Adebero, A.S., & Ademola, V.D. (2018). Effects Of Six-Week Aerobic Dance On The Resting Heart Rate, Bmi And Blood Glucose Level Of Overweight Female Administrative Staff In University Of Lagos. *JORCIHKHE*. 5(7); 76-83
3. Carson, V., Clark, D., Ogden, N., Harber, V., & Kuzik, N. (2015). Short-term influence of revised provincial accreditation standards on physical activity, sedentary behavior, and physical literacy in early childhood centers in Alberta. *Journal of Physical Activity and Health*, 12(8), 1044-1051
4. Carson, V., Lee, E. Y., Hewitt, L., Jennings, C., Hunter, S., Kuzik, N., ... & Hinkley, T. (2017). Systematic review of the relationships between physical activity and health indicators in the early years (0-4 years). *BMC Public Health*, 17(5), 854.
5. Carson, V., Clark, D., Ogden, N., Harber, V., & Kuzik, N. (2015). Short-term influence of revised provincial accreditation standards on physical activity, sedentary behavior, and physical literacy in early childhood centers in Alberta. *Journal of Physical Activity and Health*, 12(8), 1044-1051
6. Chaput, J. P., Saunders, T. J., Mathieu, M. È., & Tremblay, M. S. (2014). Physical activity, sedentary behavior, and sleep in Canadian children aged 6-7 years: combined associations with health indicators. *Journal of physical activity & health*, 11(1), 7-14.
7. Chaput, J. P., Visby, T., Nyby, S., Klingenberg, L., Gregersen, N. T., Tremblay, A., ... & Astrup, A. (2011). Video game playing increases food intake in adolescents: a randomized crossover study. *The American Journal of Clinical Nutrition*, 93(6), 1196-1203.
8. Chassiakos, Y. R., Radesky, J., Christakis, D., Moreno, M. A., Cross, C., & Council on Communications and Media. (2016). Children and Adolescents and Digital Media. *Pediatrics,* 138(5), e20162593.
9. Garrison, M. M., Christakis, D. A., Chriqui, J. F., & Liekweg, K. (2018). Media Use and Child Sleep: The Impact of Content, Timing, and Environment. *J Pediatr*, 205, 225-231.
10. Hale, L., & Guan, S. (2015). Screen time and sleep among school-aged children and adolescents: A systematic literature review. *Sleep Medicine Reviews*, 21, 50-58
11. Chioma, O. (2014). Nigerian Youths Watch Too Much TV-.A Report FOR Vanguard Newspaper. Retrieved on the 12th of July, 2016 from http://www.vanguardngr.com/2014/05/ nigerian5 youthswatch-much-tv-report/
12. LeBlanc, A. G., Spence, J. C., Carson, V., & Connor, G. S. (2012). Systematic review of sedentary behaviour and health indicators in school-aged children and youth. *International Journal of Behavioral Nutrition and Physical Activity*, 9(1), 98.
13. LeBourgeois, M. K., Hale, L., Chang, A. M., Akacem, L. D., Montgomery-Downs, H. E., & Buxton, O. M. (2017). Digital Media and Sleep in Childhood and Adolescence. *Pediatrics*, 140(2), S92-S96.

14. Mindell, J. A. (2015). Pediatric Sleep Duration Consensus Statement: A Step Forward. *The Journal of Pediatrics,* 166(3), 559-560.
15. Mindell, J. A., Leichman, E. S., DuMond, C., & Sadeh, A. (2015). Sleep and social-emotional development in infants and toddlers. *Journal of Clinical Child & Adolescent Psychology*, 44(5), 751-765.
16. Owens, J. A., Mindell, J. A., & the American Academy of Pediatrics. (2015). *Pediatric insomnia. Pediatrics*, 131(4), e1256-e1276.
17. Otinwa, G. O. Abass, A. O. Oladipo, O. I. Onwuama, M. A. C. & Adewunmi, C. M. (2016). Physical fitness survey of Nigerian school children: Pathway to life-long physicalactivity and quality health. *Journal of Health and Sports Science*, 7(2), 87-90

18. Otinwa, G.O., Esan, J.A., Amuzie, D.U (2022). The Effects of Interactive Video Games (Exergame) Adherence on Physiological and Physical Parameters among Adolescents. *2022 NUGA Scientific Journal*. From https://ir.unilag.edu.ng/handle/123456789/12428
19. Tremblay, M. S., (2016). Physical Activity Guidelines for the Early Years: An International Perspective. *Pediatric Obesity*, 11(2), 1-8.