Effects of Screen Time on the Physiological Variables of Nigeria Adolescent

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Abstract

The purpose of the study was to determine the effects of screen time on the physiological variables of Nigeria Adolescents. A quasi-experimental research design was adopted in carrying out the study. The physical characteristics of blood pressure, body composition, muscular strength and endurance of children were measured after parental consent has been obtained. The sample for this study comprised a total of sixty (60) participants selected through a convenient random sampling technique. Twenty (20) students were selected from three schools. The procedure and methods used for the study was approved by the Departmental Postgraduate Committee before carrying out the experiment. International Council for Health, Physical Education, Recreation, Sport and Dance (ICHPER.SD) Standardized test and instruments were used in data collection during the study. The instruments were calibrated. Data from the experiment conducted was analyzed using the descriptive statistics of mean and standard deviation with graphical illustration while the hypotheses were tested using the inferential statistics of independent sample t-test at a 0.05 level of significance. Findings indicated that there was a significant relationship between high and low screen time on the systolic blood pressure, diastolic blood pressure, body mass index (BMI), waist to hip ratio (WHR), muscular strength and muscular endurance of participants. The study recommends the promotion of healthy 7and active lifestyles through the support of parents and teachers.

Keywords: blood pressure, body mass index (BMI), muscular strength, endurance.

Introduction

Technological advancement has produced a generation of sedentary children globally. They are essentially glued to their seats at homes (more especially during school holiday periods or sometimes after school) focusing on television, videogames, surfing the internet and updating their status on the social network, thereby increasing their odds for excessive weight gain. Inadequate sporting facilities close to residential areas, childhood neglect, over pampering of children, provision of cheap smart phones and gadgets, use of social media have also been associated with increased screen time among children and adults leading to a higher risk of obesity and cardiovascular related illnesses. Nigerian adolescents were observed to spend too much time watching television (TV) according to a Nigerian Report Card on Physical Activity for Children and Youth in 2013. 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).

The incidence of obesity and overweight has reached epidemic proportions on a global basis (James, 2015). As children and adolescents represent the largest portion of the world's population today and in the history of humankind, they are particularly susceptible to the consequences of obesity and overweight. Work related activities have declined in the recent decades while leisure time dominated by television viewing, computer use has increased. Parents of good examples encourage and also participate in regular exercise of 30 minutes daily with their family members (American Heart Association, 2012). Family environment also plays an important role in the development of obesity globally. Several studies found a positive association between the times spent watching television and obesity in children (Lyn, Shifan, Janet & Darwin, 2009; Ralph, 2014; Thorp, Owen, Neuhaus & Dunstan, 2011). Two primary mechanisms by which television viewing contributes to obesity, have been suggested as reduced energy expenditure due to prolonged periods of inactivity and increased dietary intake, either during viewing or as a result of food advertising (James, 2015).

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. Schools are a key setting to focus on, given the significant portion of time children spend there. Schools can undertake a combination of strategies and approaches to help children be more active including: creating infrastructure and policies that increase access to and encourage physical activity for all students; collecting valid and reliable data and using analytical tools and systems to understand student needs and fitness levels, and promoting approaches that are effective in changing physical activity behaviors and, ultimately, health outcomes; maintaining strong physical education (PE) programs that engage students in moderate to vigorous physical activity for at least 50% of PE class time and providing a variety of activities and specific skills so that students can be physically active not just during class but throughout the day and year (Otinwa, Abass, Oladipo, Onwuama & Adewunmi, 2016).

The researchers observed addiction to electronic gadgets among children in Nigeria. This was not the case many years ago, as there was access to only limited technology to children. Before the mass availability of technology to everyone, majority of Nigerian children were physically active as they usually play

different games such as "Football", "Kite", "Boju Boju", "Suwe", "Ten-Ten", among others. However, today the researcher observed these active games have been replaced with more addictive passive games such as Nitendo, Play Station, Candy Crush, Pro Evolution Soccer (PES), etc. while other children are interested in watching movies and cartoons such as Sponge Bob Square Pants, Tom and Jerry, e.t.c. Parents in Nigeria have also contributed to this by preventing their children from going to play with their age mates in the neighborhood.

This observed phenomenon among Nigerian children has led to a shift from the traditional sports and games to spending more time on the screen. The American Academy of Pediatrics (AAP) (2015) recommended limiting 'screen time' to just two hours a day for children. The more time children spend on the screen (watching TV, surfing the web, chatting, playing games, e.t.c) the more likely they are to gain excess weight and have an increased blood pressure. This study therefore, seeks to determine the effects of screen time on the physiological variables of Nigeria adolescents.

The study tested these hypotheses: There will be no significant relationship between high and low screen time on the blood pressure, Body Mass Index (BMI), Waist to Hip Ratio (WHR), muscular strength and muscular endurance of Nigeria adolescents.

Methods and Procedures

The population for this study consisted of all Junior Secondary School students in Lagos Mainland Local Government Area. A total of sixty (60) participants were selected through a convenience random sampling technique. Thirty (30) male and female students were selected each. A quasi-experimental research design was adopted in carrying out the study. Informed consent form was obtained from schools, parents and research participants. Data were collected using the following equipment; Systolic and Diastolic Blood Pressure (Using Omron's M6 AC HEM-7322-E Blood Pressure Monitor), Height (Using Stadiometer), Waist and Hip circumference (Using a Measuring Tape), Weight (Using a weigh Scale), Body Mass Index (Weight/Height2) Kg/m2, Waist Hip Ratio (Waist Circumference/Hip Circumference), Muscular Strength (Hand Grip Dynamometer), Muscular Endurance (30 Sec Sit Up Test), Informed Consent form (for Parents, school and students), Modified ICHPER-SD Children Screen Time Survey Questionnaire, Modified Lifestyle Survey Questionnaire For adolescents and Data Entry Form. All data were collected during school hours throughout the duration of the study. Data were classified by gender and screen time. Results were presented as means, standard deviation and t-test along screen time differences.

Result

Table 1 presents the physical characteristics and physiological variables of participants. The results show that boys were slightly older, had greater mean muscular strength and endurance than the girls. However, girls were slightly taller, heavier and had a greater mean BMI, Waist-to-Hip ratio, systolic and diastolic blood pressure than boys..

Table 1: *Physical Characteristics and Physiological Variables of Participants*

Variables	Boys			Girls		
	n	Mean	SD	n	Mean	SD
Age (Years)	30	13.17	1.46	30	13.27	1.83
Height (cm)	30	151.36	5.33	30	154.09	6.37
Weight (kg)	30	51.82	4.61	30	55.26	3.94
BMI (kg/m2)	30	18.36	1.82	30	19.27	1.71
WHR	30	0.79	0.67	30	0.82	1.48
Systolic Blood Pressure (mmHg)	30	114.37	1.46	30	118.29	1.98
Diastolic Blood Pressure (mmHg)	30	74.69	0.24	30	76.07	0.31
Hand Grip Strength (kg)	30	23.48	6.81	30	19.07	5.78
30 Sec Sit Up Test (reps)	30	16.49	1.17	30	09.37	0.98

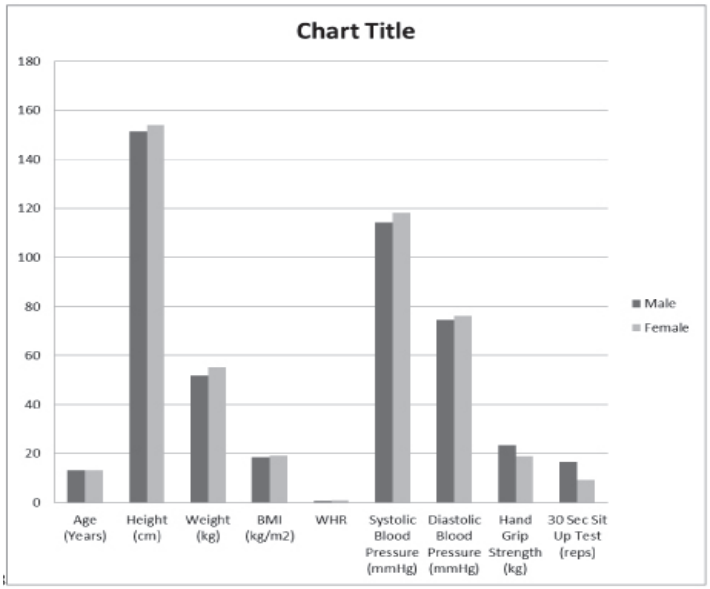

Figure 1: *Bar Chart on Physical Characteristics and Physiological Variables of Participants*

Table 2 resents the paired sample t-test analysis on the relationship between screen time on the physiological parameters of Nigeria adolescents. The results show that there was a significant relationship between high and low screen time on the systolic blood pressure, diastolic blood pressure, body mass index (BMI), waist to hip ratio (WHR), muscular strength and muscular endurance of Nigeria adolescents.

Table 2: *Paired Sample t-test Analysis on the Relationship Between Screen Time on the Physiological Parameters of Nigeria Adolescents*

Variables	Mean	n	S.D	Df	t-calc	t-crit	Remark
Systolic Blood Pressure							
Low Screen Time	116.89 mmHg	21	2.86	58	8.347*	2.001	S
High Screen Time	128.34 mmHg	39	3.45				
Diastolic Blood Pressure							
Low Screen Time	73.02 mmHg	21	0.56	58	3.372*	2.001	S
High Screen Time	78.21 mmHg	39	0.74				
Body Mass Index							
Low Screen Time	19.31 kg/m2	21	1.74	58	4.013*	2.001	S
High Screen Time	21.34 kg/m2	39	1.29				
Waist to Hip Ratio							
Low Screen Time	0.71	21	0.09	58	2.984*	2.001	S
High Screen Time	0.87	39	0.13				
Had Grip Strength							
Low Screen Time	24.09 Kg	21	5.61	58	2.509*	2.001	S
High Screen Time	18.37 Kg	39	4.48				
30 Sec Sit Up Test							
Low Screen Time	14.01 reps	21	0.32	58	5.041*	2.001	S
High Screen Time	10.27 reps	39	0.41				

*$p<0.05$; *S=Significant*

Discussion

The present study determined the effects of screen time on the physiological variables of Nigeria adolescents.

The first finding indicated a significant relationship between high and low screen time on the systolic blood pressure of Nigeria adolescents. This finding corroborates with The American Academy of Pediatrics (AAP) (2015) who recommended limiting 'screen time' to just two hours a day for children. The more time children spend on the screen (watching TV, surfing the web, chatting, playing games, e.t.c) the more likely they are to gain excess weight and have an increased blood pressure. Cody and Eisenmann (2009) discussed that sedentary behaviors such as TV viewing and "screen time" involving computers and video games are linked with elevated blood pressure in children regardless of whether they are overweight or obese. Cody and Eisenmann (2009) who also discussed that children who spent the least amount of time watching television, using the computer, and playing video games had much lower blood pressure levels than those who spent the most time in front of a screen. Other forms of sedentary activity, however, were not significantly related to elevated blood pressure. "It appears other factors, which occur during excessive screen time, should also be considered in the context of sedentary behavior and elevated blood pressure development in children," "TV viewing often comes with unhealthy snacking behavior, and also can lead to stress responses that disrupt sleep." Elevated blood pressure has been increasing among U.S. children, the authors write. They advocate limiting screen time to less than 2 hours per day and balancing that by at least 60 minutes of daily physical activity (Health Day, 2011).

This findings on Body Mass Index (BMI) of Nigeria adolescents correlates with that of Lyn, Shifan, Janet and Darwin, (2009) who in a cross-sectional study, observed that children who watched more than 5 hours of TV per day were 4.6 times as likely to be overweight as children who watched 0–1 hour per day. Findings from longitudinal studies also show that children who watch more TV have increasing body mass, ad waist to hip ratio (WHR) even after 6 or 11 years of follow-up assessment. A randomized trial among elementary school children provided evidence that TV viewing affected BMI; when time spent watching TV was reduced, relative to that for children in control schools, BMI was also reduced after 1 year. Several trials designed to reduce children's TV use have found improvements in body mass index (BMI), body fat, and other obesity-related measures. Based on this evidence, the U.S. Task Force on Community Preventive Services recommends that communities roll out behavior-change programs aimed at curbing screen time, since there's "sufficient evidence" that such programs do help reduce screen time and improve weight (Grontved & Hu, *2011*).

The significant relationship between high and low screen time on the waist to hip ratio (WHR) of Nigeria adolescents is in line with Havard School of Public Health, (2016) who linked TV watching to obesity more than 25 years ago. Since then, extensive research has confirmed the link between TV viewing and obesity in children and adults, in countries around the world. And there's good evidence that cutting back on TV time can help with weight control-part of the reason why many organizations recommend that children and teens limit TV/media time to no more than two hours per day. Some of these successful TV-reduction trials have been delivered through the schools: The Planet Health trial, for example, used middle school classroom lessons to encourage less TV viewing, more activity, and improvements in diet; compared to the control group, students assigned to receive the lessons cut back on their TV time, and had lower rates of obesity in girls. Another trial found that third-and fourth-graders who received an 18-lesson "TV turnoff" curriculum cut back on TV time and on meals eaten while watching TV, compared with children in the control group, and they had a relative decrease in BMI and other measures of body fatness. TV "allowance" devices, which restrict TV watching to a set number of hours per week, may help limit children's screen time, and in turn, help with weight control (Thorp, Owen, Neuhaus & Dunstan, *2011*).

The significant relationship between high and low screen time on the muscular strength of Nigeria adolescents is in line with the findings of Ralph (2014) who observed that screen-based activities are highly enjoyable and have an exceptional ability to capture and hold children's attention. However, there is a negative correlation between screen time and muscular strength. The more time children spend on the screen, the more they lose muscular strength, endurance, agility, power, among others that could easily be gained through active recreational activities.

The findings on muscular endurance of Nigeria adolescents agrees with James (2015) who found a positive association between the times spent watching TV and muscular endurance in children. Two primary mechanisms by which television viewing reduces muscular endurance have been suggested as reduced energy expenditure due to prolonged periods of inactivity and increased dietary intake, either during viewing or as a result of food advertising. Physical activity on the other hand, helps to promote

muscular endurance. The low levels of physical fitness are directly related to the increase of sedentary lifestyle in the contemporary society, especially due to the interest in passive recreational activities such as portable games, television and computers (Otinwa, Abass, Oladipo, Onwuama & Adewunmi, 2016).

Conclusion and Recommendations

Most adolescents have been observed to have a high screen time focusing on television, videogames, surfing the internet and updating their status on the social network, thereby increasing their resting blood pressure, resting heart rate, body mass index, waist to hip ratio and muscular endurance. High amount of time spent on the screen increases sedentary lifestyle and reduces regular participation in different types of fitness activity which is essential for healthy growth and development of children. The challenges associated with getting children active every day should be met with making physical activities compulsory daily in schools, and support from family in other to reduce passive recreation and increase active participation in exercise and physical activities.

The promotion of healthy active lifestyles in a holistic fashion is essential in promoting the welfare of children and youth. To address issues related to obesity and overweight, programmes in schools and in community life need to be developed that reinforce a child's interest in making physical activity a lifelong pursuit. Parents have a key role to play in encouraging the development of an obesogenic environment at home, especially through their examples on their kids. Parents need to be involved in order to address such concerns as regards screen time of their children. Excessive use of screen time should be reduced in other to decrease the consequences of the impact which would be that many Nigerians will be at risk of NCDs, such as obesity, hypertension, e.t.c due to decreased physical activity. Parents should be encouraged to promote active physical activities among their children and reduce passive recreational activities in other to promote their quality of health. Federal Ministry of Health should recommend less than sixty minutes of screen time daily to adolescents. Parents should ensure they create space to exercise in other to tackle the problem of congestion and overcrowding in their residential areas.

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