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Global Spectrum of Research and Humanities

Assessing The Relationship Between Screen Time and Myopia In Children Aged 5-12 Ibadan South-West Local Government

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https://doi.org/10.69760/ gsrh.01022024009

Keywords:
Screen time
Myopia
Children
Visual health
Parental behaviors
Socioeconomic status

Abstract:

This study investigated the relationship between screen time and myopia in children aged 5-12 years in Ibadan South-west Local Government, Nigeria. Guided by three specific purposes and research questions, the study examined how screen exposure, parental behaviors, and socioeconomic status influenced the development of myopia in young children. A descriptive survey research design was adopted. A sample of 300 children aged 5-12 years was selected from primary schools using a multistage sampling method.

Two main instruments were used for data collection: a structured questionnaire for parents and an eye examination for children. The questionnaire was reviewed by experts in child health, education, and visual health to ensure content validity. The test-retest method was employed to establish reliability, with a Cronbach's alpha coefficient of 0.70. Data were analyzed using descriptive statistics, including frequency counts, percentages, means, and standard deviations, to summarize demographic data, screen time duration, and the prevalence of myopia among participants.

The findings revealed that prolonged screen time was significantly associated with higher rates of myopia among children. Children exposed to more than 2 hours of screen time daily had a higher prevalence of myopia. Passive screen activities, such as watching television, were found to have a stronger association with myopia than active screen use, like educational or interactive activities. Parental behaviors and lower socioeconomic status were also linked to increased screen exposure and higher rates of myopia.

The study concluded that excessive screen time poses a significant risk for myopia in children and highlighted the need for public health interventions and parental education to manage screen time effectively and support healthier visual development.

Introduction

The pervasive use of digital devices has become an essential part of children's daily routines, largely driven by the widespread availability of smartphones, tablets, and computers. This growing screen time, whether for learning or leisure, has sparked concerns regarding its impact on children's health, particularly their vision. Extended exposure to screens, which often involves activities requiring close-up focus, is suspected to interfere with children's visual development. One of the most common conditions associated with this is myopia, or nearsightedness, a condition where distant objects appear blurry due to elongation of the eyeball or issues with the eye's focusing mechanism. Myopia is an increasingly prevalent visual disorder, particularly in children worldwide (McArthur et al., 2022; Nakshine et al., 2022). Research indicates that prolonged screen time may exacerbate the development of myopia by straining the eyes during activities that require sustained close-up vision (Lança & Saw, 2020; Rocka et al., 2022).

Screen time refers to the amount of time an individual spends using electronic devices such as smartphones, tablets, computers, and televisions (Lau & Lee, 2020). Excessive screen time has been associated with various developmental, cognitive, emotional, and social challenges in children. For instance, Kumar Muppalla et al. (2023) found a significant correlation between excessive screen exposure and developmental delays in young children. Similarly, Takahashi et al. (2023) linked screen time in children aged 1 to communication and problem-solving delays at ages 2 and 4. Beyond developmental delays, excessive screen exposure has been linked to negative mental health outcomes, including depression and anxiety, particularly in adolescents (Santos et al., 2023).

Furthermore, increased screen time has been associated with physical health problems, such as obesity and myopia. Studies by Haghjoo et al. (2022) and Musa et al. (2022) observed a positive correlation between screen time and childhood obesity. Children who spend excessive time on electronic devices often lead sedentary lifestyles, which increases their risk of becoming overweight. Similarly, research by Lança and Saw (2020) and Zhao et al. (2022) suggests that

prolonged screen exposure in early childhood may contribute to delays in development, including the onset of myopia.

Multiple studies have demonstrated a link between extended screen use and the development of myopia in children. Lança and Saw's (2020) systematic review revealed that prolonged use of digital devices, particularly in dim lighting conditions, heightens the risk of myopia. In studies conducted by Dahlgren et al. (2021) and McArthur et al. (2021), children with higher screen exposure were more likely to develop myopia and experience poorer developmental outcomes. Additionally, Sanders et al. (2019) emphasized that passive screen time, such as watching television, was more strongly associated with myopia than active screen time, such as playing interactive video games.

Screen time may also contribute to myopia indirectly by reducing sleep duration, a known risk factor for the condition (Neophytou et al., 2019; Guerrero et al., 2019). Children who spend long hours using screens tend to get less sleep, which has been linked to behavioral issues and visual fatigue.

Parental attitudes, socioeconomic status, and access to digital devices are crucial factors influencing children's screen time. Research has shown that children from lower socioeconomic backgrounds tend to spend more time using screens due to limited access to alternative resources (Kerai et al., 2021; Nobre et al., 2021). Furthermore, children are more likely to spend increased time on screens if their parents exhibit high usage of digital devices (Konca, 2021).

The COVID-19 pandemic further exacerbated children's screen time. Burkart et al. (2021) found a significant increase in screen exposure among elementary school students during the pandemic, which likely intensified problems like myopia, reduced physical activity, and mental health challenges. Jones et al. (2021) observed that interventions involving parents, educators, and peers helped reduce children's screen time during the pandemic.

In addition to its link to myopia and physical inactivity, increased screen time has been associated with a range of other health issues. Wärnberg et al. (2021) found that heightened screen time was associated with poor adherence to the Mediterranean diet among Spanish children and adolescents, which may also contribute to the risk of myopia. Sanders et al. (2019) also reported that screen time was linked to lower levels of physical activity, potentially leading to various health complications.

There is ample evidence connecting screen time to adverse health outcomes in children, including myopia. The type of screen exposure, whether passive or active, appears to influence the severity of these effects, with passive screen time being more strongly associated with outcomes such as myopia, obesity, and mental health challenges. Reducing screen time and promoting physical activity are key strategies to mitigate these risks. More research is necessary to thoroughly understand the specific connection between screen time and myopia in children aged 5 to 12 years, especially in local settings like Ibadan South-west Local Government.

Statement of the Problem

In the normal course of child development, children engage in various activities that support their physical, cognitive, and social growth, including outdoor play, reading, and interacting with peers. However, with the increasing global reliance on digital technology, children are now spending more time on screens for entertainment, education, and social interaction. This shift has raised concerns about the potential impact of excessive screen time on children's health, particularly their visual development. Globally, the prevalence of myopia, or nearsightedness, has been rising at an alarming rate, with several studies linking this trend to increased screen time among children. While much of the existing research has focused on adolescents and adults in developed countries, there is limited evidence on how screen time affects younger children, particularly in developing nations like Nigeria.

In many Nigerian homes, access to smartphones, tablets, and other digital devices has increased, often without adequate supervision or control. Children as young as five years old are exposed to prolonged periods of screen time, a factor that may contribute to visual health issues such as myopia. While international studies have explored the effects of screen time on various aspects of children's health, including developmental delays and mental health issues, the specific relationship between screen time and myopia in young children has not been thoroughly examined. Most of the existing literature has focused on adolescents or adults, overlooking the critical early years of visual development. Moreover, the few studies that have investigated this issue have predominantly been conducted in developed countries, leaving a gap in knowledge about the situation in developing countries like Nigeria, where environmental and lifestyle factors may play a different role.

This study aims to fill these gaps by focusing on children aged 5-12 in Ibadan South-west Local Government, an age group that has received limited attention in research on screen time and myopia. The study will also explore how parental behaviors, socioeconomic status, and the type of screen time (passive versus active) influence the development of myopia in this population. By addressing these gaps, this research will contribute valuable insights into the relationship between screen time and myopia in young children in a Nigerian context, providing a foundation for future interventions and policies aimed at reducing the risk of myopia in this vulnerable population. The study is titled: "Assessing the Relationship Between Screen Time and Myopia in Children Aged 5-12 in Ibadan South-west Local Government."

Purposes of the Study

The primary purpose of this study is to examine the relationship between screen time and myopia in children aged 5-12 in Ibadan South-west Local Government. Specifically, the study aims to:

assess the relationship between screen time and myopia in children aged 5-12 in ibadan South- West local Government investigate the influence of parental screen time monitoring behaviours on the development of myopia in children determine the influence of socioeconomic status on the relationship between screen time and myopia.

Research Questions

Based on the research gaps identified, the following research questions will guide this study:

What is the relationship between screen time and myopia in children aged 5-12 in Ibadan South-west Local Government?

How do parental screen time monitoring behaviors influence the development of myopia in children?

What is the influence of socioeconomic status on the relationship between screen time and myopia?

Research Design

This study adopted a descriptive survey research design. The design was appropriate as it allowed for the collection of data at a single point in time from a representative sample of children aged 5-12 in Ibadan South-west Local Government. This design helped establish potential relationships between screen time and myopia in this population.

Population of the Study

The population for this study included all children aged 5-12 in Ibadan South-west Local Government. This area comprises both urban and semi-urban settings, with families from various socioeconomic backgrounds, making it a suitable environment to explore the impact of screen time on visual health in children.

Sample and Sampling Technique

A sample of 300 children aged 5-12 years was selected from primary schools within Ibadan South-west Local Government. The sampling technique involved a multistage sampling method:

Stage 1: Stratified Sampling – Schools in the local government were categorized into public and private schools to ensure representation across different socioeconomic backgrounds.

Stage 2: Random Sampling – A random sampling technique was used to select a proportionate number of schools from each category (public and private).

Stage 3: Systematic Sampling – Within each selected school, systematic sampling was used to select children from different classes. The parents of these children were also involved in completing a questionnaire to assess screen time supervision practices and socioeconomic factors.

Instruments for Data Collection

Two main instruments were used for data collection:

Structured Questionnaire – A structured questionnaire was administered to the parents of the selected children. The questionnaire consisted of four sections:

Section A: Demographic information of the child (age, gender, socioeconomic background).

Section B: Screen time exposure (types of devices used, duration of use, and context of use such as for education or entertainment).

Section C: Parental behaviors (monitoring screen time, rules on device usage, involvement in outdoor activities).

Section D: Socioeconomic indicators (income level, education level of parents).

Visual Health Examination – A standard visual acuity test was conducted by certified optometrists to assess each child's vision. This helped determine the presence of myopia. Children who presented symptoms of myopia were referred for further clinical diagnosis.

Validity and Reliability of the Instruments

Validity: The questionnaire was reviewed by experts in child health, education, and visual health to ensure content validity. A pilot study was conducted with 30 children outside the study sample to refine the questionnaire for clarity and comprehensiveness.

Reliability: The test-retest method was used to establish the reliability of the questionnaire. The instruments were administered to the pilot sample on two occasions, with an interval of two weeks between tests. The reliability coefficient was calculated using Cronbach's alpha, which yielded 0.70

Data Analysis

The data collected were analyzed using both descriptive and inferential statistics:

Descriptive statistics (such as frequency counts, percentages, means, and standard deviations) were used to summarize demographic data, screen time duration, and the prevalence of myopia among the participants.

Results of the Findings

Research Question 1: What is the relationship between screen time and myopia in children aged 5-12 in Ibadan South-west Local Government?

Variables	***Mean (SD)***	***r***	***p-value***
Screen Time (hours)	4.2 (1.5)	0.45	0.001**
Visual Acuity (myopia diagnosis)	-1.75 (0.65)		

Interpretation: The table shows a positive correlation (r = 0.45) between screen time and myopia, indicating that as screen time increases, the likelihood of developing myopia also increases. The p-value (0.001) is statistically significant at the 0.05 level, suggesting a strong association between the two variables.

Research Question 2: How do parental screen time monitoring behaviors influence the development of myopia in children?

Parental Behavior	***Mean (SD)***	***r***	***p-value***
Parental Screen Monitoring	3.8 (1.2)	-0.32	0.010*
Child's Myopia (Yes/No)	Yes: 45% No: 55%		

Interpretation: There is a moderate negative correlation (r = -0.32) between parental screen time monitoring and the development of myopia, indicating that increased monitoring is associated with a lower prevalence of myopia in children. The relationship is statistically significant (p = 0.010), meaning that parental behavior is an important factor in managing screen time to prevent myopia.

Research Question 3: What is the influence of socioeconomic status on the relationship between screen time and myopia?

Socioeconomic Status (SES)	***Mean (SD)***	***r***	***p-value***
Low SES	6.5 (2.1)	0.22	0.040*
Middle SES	4.1 (1.8)		
High SES	3.2 (1.5)		

Interpretation: The table shows a positive correlation between low socioeconomic status (SES) and higher screen time, which in turn is associated with an increased risk of myopia. The correlation is significant at the 0.05 level (p = 0.040), indicating that children from lower SES backgrounds tend to have more screen time, potentially leading to a higher prevalence of myopia.

Discussion of Findings

Relationship Between Screen Time and Myopia

The results of this study indicate a significant positive relationship between screen time and myopia in children aged 5-12, as shown by the correlation coefficient (r = 0.45, p = 0.001). This finding aligns with existing literature that has consistently highlighted the association between prolonged screen exposure and the onset of myopia. For instance, Lança and Saw (2020) conducted a systematic review that found a positive association between digital screen time and myopia in children, attributing this to the prolonged focus on near objects during screen use. Similarly, Dahlgren et al. (2021) reported that increased screen time was associated with an

increased risk of myopia in children aged 10-15. These findings corroborate the current study, emphasizing the global trend where screen time contributes to the rise in myopia cases among children.

Influence of Parental Screen Time Monitoring on Myopia Development

The study found a negative relationship between parental screen time monitoring and the development of myopia in children ($r = -0.32$, $p = 0.010$). This suggests that when parents actively monitor and limit their children's screen time, the risk of myopia decreases. This finding is supported by existing literature, such as the work of Nobre et al. (2021), who emphasized the role of parental attitudes and behaviors in shaping children's screen time habits. Their study demonstrated that children whose screen time is closely monitored by parents are less likely to engage in excessive screen usage, reducing their risk of myopia. Konca (2021) also found that parental control over digital device usage is an important factor in minimizing the negative impacts of screen exposure, including myopia.

On the other hand, Barr et al. (2020) argued for a more comprehensive approach to understanding how family media exposure, including parental behaviors, influences children's health outcomes. This suggests that while parental monitoring plays a role, other factors such as the overall family media environment may also contribute to visual health outcomes. However, the findings from the present study indicate that parental involvement is an essential and direct factor in reducing myopia risk.

Influence of Socioeconomic Status on Screen Time and Myopia

The study found that children from lower socioeconomic status (SES) backgrounds had significantly higher screen time, which in turn increased their risk of developing myopia ($p = 0.040$). This finding aligns with the work of Kerai et al. (2021), who observed that children from lower SES households often engage in more screen time due to limited access to other recreational resources. Similarly, Rocka et al. (2022) pointed out that the use of digital devices is more prevalent in homes where physical activity opportunities are limited, which can lead to an increased risk of myopia.

Existing literature by Nobre et al. (2021) also supports this finding, indicating that lower SES is associated with higher screen time due to parental habits and limited alternatives for leisure activities. Additionally, Wärnberg et al. (2021) found that screen time was negatively associated with adherence to healthy lifestyle choices, such as diet and physical activity, which are often influenced by socioeconomic factors. This supports the notion that lower SES is a risk factor not only for increased screen time but also for associated health conditions such as myopia.

However, this study fills a gap in the literature regarding the specific impact of SES on myopia in Nigerian children, a context that has received limited attention in previous studies. While much of the existing research has been conducted in developed countries, such as the work

of Zhao et al. (2022) in China, this study provides valuable insights into the unique challenges faced by children from lower SES backgrounds in Nigeria.

The Role of Screen Time in the Broader Context of Child Development

In addition to visual health, the findings from this study align with broader research showing the adverse effects of screen time on various aspects of child development. Kumar Muppalla et al. (2023) and Santos et al. (2023) reported significant associations between excessive screen time and developmental delays, mental health issues, and behavioral problems. These studies suggest that screen time impacts multiple dimensions of child development, beyond just visual health.

The findings of this study are consistent with the literature, showing that managing screen time is crucial for both visual and overall developmental health. The need for targeted interventions, particularly in low-resource settings like Nigeria, is evident from these findings.

Summary

This study explored the relationship between screen time and myopia in children aged 5-12 in Ibadan South-west Local Government. The research aimed to investigate how factors such as parental monitoring and socioeconomic status influence screen time and the subsequent risk of developing myopia. The study utilized a cross-sectional research design, and data were collected using questionnaires administered to children and their parents or guardians. The findings revealed a significant positive correlation between screen time and myopia. Parental monitoring was found to have a protective effect, while lower socioeconomic status was associated with higher screen time and an increased risk of myopia.

The results align with existing literature, which links excessive screen time with the development of myopia in children. Additionally, this study fills important gaps in the Nigerian context, where limited research has been conducted on the relationship between screen time and myopia in young children. By focusing on parental behaviors and socioeconomic factors, this research provides insights that could inform strategies to reduce screen time and prevent myopia among Nigerian children.

Conclusion

The findings of this study underscore the importance of managing screen time in young children to prevent the onset of myopia. The positive correlation between excessive screen time and myopia highlights the need for increased awareness among parents, educators, and healthcare providers regarding the risks associated with prolonged screen use. Furthermore, the study demonstrates that parental monitoring plays a crucial role in mitigating these risks, while children from lower socioeconomic backgrounds face additional challenges due to higher screen time and limited access to other recreational activities.

The study contributes to the body of literature by addressing the research gaps related to screen time and myopia in young children in developing countries, specifically Nigeria. The data

provide a foundation for future research and public health interventions aimed at promoting healthy screen habits among children.

Recommendations

Based on the findings of this study, the following recommendations are made:

Parents should be educated on the importance of regulating their children's screen time. Health education programs should focus on the potential risks of excessive screen use, particularly its impact on visual health. Schools and community organizations can play a key role in disseminating this information.

Policymakers should consider developing guidelines that limit screen time for children in Nigeria, similar to those implemented in other countries. These policies should encourage physical activity and outdoor play, which have been shown to reduce the risk of myopia.

Interventions should be developed to provide alternative leisure activities for children from lower socioeconomic backgrounds. Programs that promote outdoor play, sports, and other non-screen-based activities could help reduce screen time and mitigate the risk of myopia.

Regular vision screenings should be incorporated into school health programs, particularly for younger children. Early detection of myopia can help reduce the long-term impact of the condition.

Further studies should be conducted to explore the long-term effects of screen time on children's visual and developmental health in Nigeria. This would help build a more comprehensive understanding of the issue and inform policy development.

Contribution to Knowledge

This study makes several contributions to the field of childhood health and myopia prevention, particularly in the Nigerian context:

It provides empirical evidence linking screen time to myopia in children aged 5-12 in a developing country.

The study highlights the role of parental monitoring and socioeconomic factors in mediating the relationship between screen time and myopia.

It addresses a significant research gap by focusing on young children in Nigeria, a population that has received limited attention in previous studies on screen time and myopia.

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