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RESEARCH ARTICLE

"ASSESSING THE EFFECTIVENESS OF AWARENESS PROGRAM ON THE IMPACT OF EXCESSIVE SCREEN TIME ON ADOLESCENT WELL-BEING"

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Abstract

Introduction: In today's technology-driven world, shielding adolescents from electronic devices is nearly impossible. However, it is crucial to promote responsible use of such gadgets. This study focuses on the impact of digital technology on the physical and mental health of adolescents during a critical developmental phase.

Objectives: The primary aim was to assess the effectiveness of a teaching program in raising awareness among adolescent students, in Bangalore, about the negative effects of excessive gadget use and strategies to mitigate these issues.

Methods: A quantitative descriptive study was conducted using a one-group pretest-posttest quasi-experimental design. A convenience sample of 60 undergraduate adolescents participated. Data was collected through a pre-tested, semi-structured questionnaire administered both before and after the intervention.

Results: The study findings revealed a 51.14% improvement in overall knowledge scores post-intervention. The calculated t-value was 28.41, which was statistically significant ($P < 0.001$). These results indicate a significant enhancement in participants' awareness, demonstrating the effectiveness of the teaching program.

Conclusion: The study highlights digital technology as a potential challenge, particularly for the physical and mental well-being of adolescents. Educating young people about the responsible use of electronic devices is vital to their holistic development. Efforts to promote such awareness contribute to nurturing well-rounded and health-conscious citizens.

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Introduction:-

The use of technology has rapidly increased in recent decades, especially with mobile phones and the internet, which emit radiation. The less time you spend with electronic devices, the more physically active you can become. As a tech-savvy adolescent, it's important to develop smart habits by reducing screen time. Avoid watching TV while eating, and when you need to relax, opt for increasing your outdoor physical activities. Consider planning a trip to a place that interests you, or engage in hobbies you enjoy, instead of adding more screen time to your day.

Although smartphones offer numerous benefits, their rapid increase in usage also presents several challenges. Issues like excessive screen time, digital addiction, and privacy risks have raised concerns among researchers and

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policymakers. Furthermore, the production and disposal of smartphones create environmental challenges, particularly through the accumulation of electronic waste.^[1]

Today's students heavily depend on electronic devices, spending significant time on phones, tablets, computers, TVs, iPods, and gaming consoles. Research has shown that students use these devices for various activities, including studying, playing games, watching videos, listening to music, chatting with friends, and browsing the internet. However, much of this time is spent without considering important factors that can negatively impact their health, such as poor posture while using devices, improper screen brightness, and the distance between the screen and their eyes. These habits can lead to eye strain and other physical issues over time.^[2]

A study was conducted in Hyderabad with 200 participants, consisting of 77 men and 123 women, aged between 15 and 25 years. The majority of participants owned two or more electronic devices. The questionnaire was designed to address concerns related to the overuse of technology. The study examined factors such as the duration of device usage, locations of use, and health issues such as stress, headaches, anxiety, depression, and withdrawal symptoms associated with excessive usage. Participants who used devices for more than six to eight hours daily also exhibited impairments in logical thinking and memory.^[3]

The study aimed to assess the average time schoolchildren spend on computers and electronic games, their sitting positions, and any discomfort associated with their use. A questionnaire was distributed to 476 children from grades 1 to 8 in New York City. The results indicated that children use computers and electronic games differently from adults, with a higher proportion of boys playing electronic games compared to girls. The study also revealed that many children experienced discomfort while using these devices, particularly in the neck area.^[4]

A cross-sectional study conducted among 1,803 secondary school students in Bangladesh found that 67.11% used mobile phones daily. Due to the COVID-19 pandemic, 24.48% attended online classes, which significantly increased gadget usage ($P < .05$) from 2019 to 2020. More than half of the students spent less than one hour outdoors each day. The study also revealed a correlation between increased gadget use and health issues, including headaches, backaches, vision disturbances, and insomnia.^[5]

A descriptive study conducted with 240 students aged 12 to 16 at a government high school in Mangalore, Karnataka, investigated the effects of electronic gadgets on behavior, academics, and health. The results showed that 69% of students used electronic gadgets before bedtime, with 59% experiencing morning headaches and vision problems. Additionally, 53% of students reported difficulties concentrating during class and while studying. While electronic device use was not the sole factor, it played a significant role in contributing to various health issues such as obesity, sleep disturbances, eye strain, and aggressive behavior, impacting both physical and mental well-being.^[6]

The research has primarily concentrated on the effects of information communication technology and electronic devices on youth, often overlooking children aged four to twelve in classroom environments. This article explores how these devices affect young children in educational settings. Through interviews and a literature review, a conceptual model emphasizing motivation, usability, acceptability, and ease of use was developed. The findings highlight significant impacts on both physical and mental well-being, urging educators and institutions to factor in the use of information communication technology and electronic gadgets when developing their strategies.^[7]

The study investigates the relationship between obesity and factors such as electronic device usage, sleep habits, stress, and physical activity among 150 overweight high school students. The results suggest that the use of gadgets has a positive influence on physical activity, which subsequently impacts obesity levels. Additionally, gadget usage is linked to sleep patterns and stress levels. The research reveals both direct and indirect correlations between gadget addiction and stress, physical activity, sleep, and obesity.^[8]

The study aimed to evaluate the effectiveness of an "ergonomics for computer use" training program for staff at Majan College. The program included a PowerPoint presentation with multimedia press clippings, along with demonstrations of exercises focused on proper computer usage and ergonomics. The results showed a noticeable increase in average post-test scores. The paired "t" test revealed a significant difference between pre-test and post-test scores ($t_{29} = 11.466$) at a 5% significance level.^[9]

An online survey examined the impact of the lockdown on schoolchildren's sleep patterns and screen time. The results showed a significant reduction in social jet lag and insomnia, but an increase in inertia. Notable differences in screen time were observed between weekdays before the lockdown and weekends during the lockdown. The study identified three distinct clusters based on screen time and sleep behavior. Cluster 2, in particular, showed increased screen time and longer sleep durations. These findings provide valuable insights for developing strategies aimed at reducing screen time among schoolchildren.^[10]

A cross-sectional study was conducted to evaluate the prevalence and factors associated with problematic smartphones and social media use among school-going adolescents. The study included 320 students from grades 8 to 10, who were assessed using the Smartphone Addiction Scale-Short Version (SAS-SV) and the Social Media Disorder (SMD) scale to determine usage patterns. The results revealed that 8% of students used smartphones for more than four hours a day, with 12.5% experiencing problematic smartphone use and 11.9% facing issues related to social media use. Increased smartphone usage and frequent social media posts, especially on platforms like Facebook and Instagram, were linked to higher levels of problematic use. Following an educational session on responsible smartphone usage, 80.6% of participants supported the implementation of such programs in schools. The study suggests that approximately one in ten adolescents may be at risk for problematic smartphone and social media use, emphasizing the potential benefits of awareness programs in schools.^[11]

A study involving 531 children aged 3 to 14 explored the impact of extended electronic device use on children's oral health, overall well-being, and quality of life. The results revealed that excessive use, defined as more than five hours a day, hurt children's oral hygiene, general health, and overall quality of life. The study emphasizes the importance of protecting children from the potential harm of prolonged screen time, with the support of parents, educators, and society, given the critical role children play in the future of the nation.^[12]

In a cross-sectional study, the effects of screen time on the mental and physical health of children aged 2 to 18 were examined. Parents completed a structured questionnaire, while psychologists and pediatricians assessed the outcomes. The study, which involved 155 children, found that average screen time during weekdays was 4 hours for children aged 2–5, 5.83 hours for children aged 5–10, and 6.29 hours for those aged 10–18. Screen time increased on weekends, with 5.64, 5.76, and 7.69 hours, respectively. Nearly 70% of the children experienced malnutrition, and only 18% were aware of the concept of screen-free days. The study found a significant correlation between screen time and negative behavioral ($P=0.001$) and health ($P=0.0001$) outcomes. Additionally, screen time tripled from pre-COVID to during the COVID-19 pandemic, highlighting the need for greater awareness and regulation of screen time, particularly in underdeveloped countries.^[13]

Excessive screen time is widely acknowledged to have negative effects on health, leading to problems such as headaches, nausea, eye strain, and psychological impacts^[17]. Adolescents have seen a significant increase in mobile phone usage, largely due to the growing importance of these devices during this stage of development compared to other life stages. Therefore, the current study aimed to enhance awareness about the effects of prolonged screen time and its potential impact on adolescent health.

Materials and Methods:-

Study Design and Setting:

This study employed an evaluation approach using a quasi-experimental design with a one-group pretest-posttest method. The study was conducted among 60 adolescent students in Bangalore from February 11, 2024, to April 30, 2024.

Study Framework:

O1 → X → O2

(O1: Pretest, X: Intervention, O2: Posttest)

Study Participants and Sampling:

A purposive sampling technique was used to recruit 60 adolescent students aged 14 to 19 years. Inclusion criteria involved students who were willing to participate, available during the data collection period, and proficient in reading and writing English.

Data Collection Tools and Techniques:

Data were collected using a semi-structured questionnaire divided into two sections:

1. Section A: Demographic information.
 2. Section B: Knowledge-based questions on the effects of excessive screen time on adolescent well-being.
- The awareness program was conducted immediately after the pretest, and the posttest was administered during the second week following the intervention.

Statistical Analysis:

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 22. Suitable statistical tests were applied to interpret the results based on the study objectives.

Ethical Considerations:

All participants were provided with detailed information regarding the purpose, procedure, and benefits of the study. Written informed consent was obtained from each participant before the commencement of data collection.

Results:-

Descriptive statistics, including frequency and percentage, were used to analyze the collected data.

Table1:- PercentageDistributionofSamples AccordingtoDemographicVariables N = 60

Sl.No	Demographic Variables	Frequency	Percentage(%)
1	Age		
	14-15years	17	28.33 %
	16-17years	14	23.33%
	18- 19 years	29	48.33%
2	Residency		
	Urban	33	55%
	Rural	27	45
3	Numberofsiblings		
	1	7	11.7 %
	2	27	45%
	Morethan2	26	43.33%
4	ParentsEmployment		
	Employed	44	73.33%
	Unemployed	16	26.7%
5	Numberofelectronicdevicesowned		
	1	9	15%
	2	18	30%
	3 and more	33	55%
6	Approximateusageofelectronicdevices		
	Lessthan2Hours/day	4	6.7%
	2-4Hours/day	18	30%
	4 – 6 Hours/day	20	33.3%
	Morethan6Hours/day	18	30%

Table 1 indicates that the majority of participants, 29 (48.33%), were aged between 18 and 19 years, and most, 33 (55%), resided in urban areas. Among the students, 27 (45%) had 2–3 siblings, and the majority, 44 (73.33%), had parents who were employed. Furthermore, 33 (55%) of the students reported using more than three electronic devices, and 18 (30%) spent over six hours per day on electronic devices. Social media was identified as the primary source of information for 38 (63.33%) of the participants.

Table2:- FrequencyandPercentageDistributionofPretestandPosttest Knowledge ofAdolescents on theEffects of Excessive Screen Time on Adolescent Well-Being. N = 60

Aspects	Pretest				Posttest			
	Mean score	% of knowledge score	Overall Mean score	Overall Knowledge %	Mean score	% of knowledge score	Overall Mean score	Overall Knowledge %
General information	1.45	42.1%	10.03	41.38 %	2.85	96.3%	23.26	92.52 %
Effects of over-usage	2.15	41.7%			4.88	96.0%		
Exercises/relaxation	1.68	34.0%			5.88	94.0%		
Early Signs and Symptoms	2.05	42.0%			4.22	84.4%		
Prevention	2.70	47.1%			5.43	91.9%		

Table 2 shows an improvement in knowledge across all aspects after the intervention. The overall pretest mean score was 10.03, representing 41.38% of the total knowledge score, which increased significantly to an overall posttest mean score of 23.26, accounting for 92.52%. Individual aspects such as general information, effects of over-usage, exercises/relaxation, early signs and symptoms, and prevention showed marked improvements in knowledge percentages, highlighting the effectiveness of the intervention program.

Figure1:- PercentageDistributionofPretestandPosttest Knowledge ofAdolescents on theEffects of Excessive Screen Time on Adolescent Well-Being.

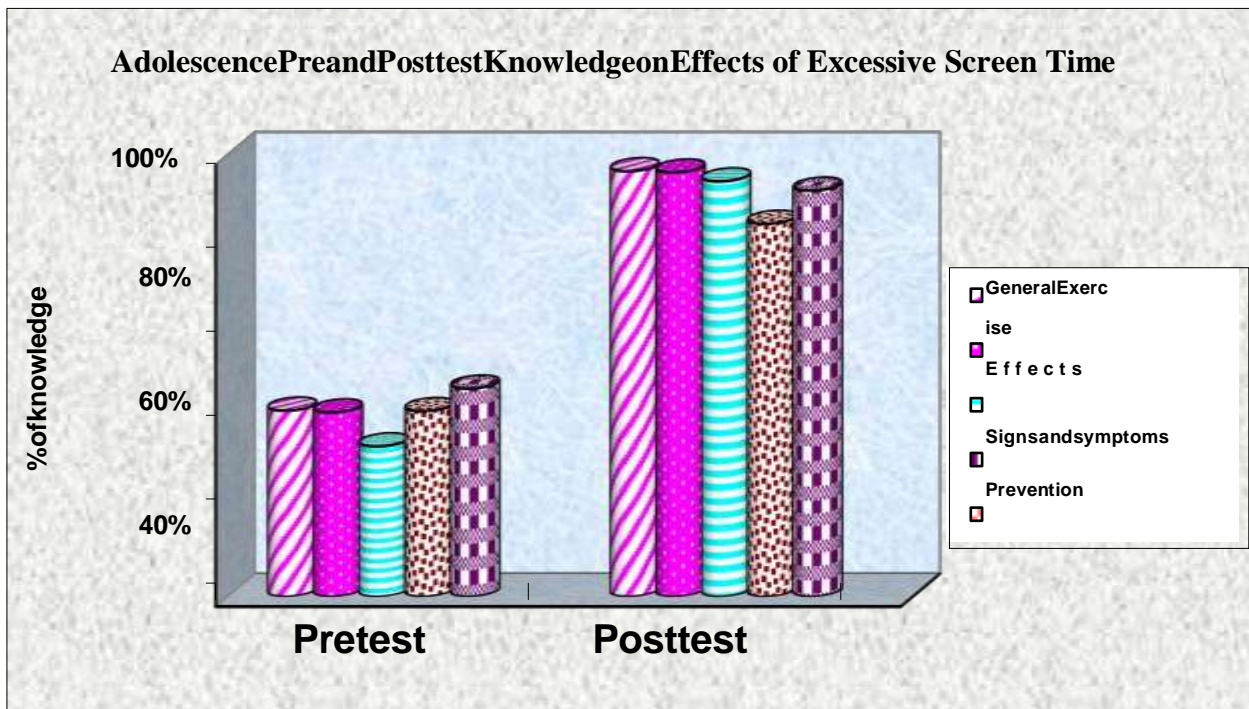


Figure1 illustrates that the overall pretest knowledge score was 41.38%, which increased significantly to 92.52% in the post-test.

Table3:- Comparison of the Knowledge Score between the Pre and Posttest Knowledge of Adolescents on the Effects of Excessive Screen Time on Adolescent Well-Being.

Knowledge	Pre-test			Post-test			Difference in % of Knowledge	t-value p-value
	%	Mean	SD	%	Mean	SD		
Overall	41.38	22.39	6.25	92.52	51.98	9.09	51.14%	t = 28.41,
Knowledge	%			%				p < 0.001
								(Significant)

Table 3 highlights the overall posttest knowledge score increased to 92.52% from a pretest score of 41.38%, reflecting a significant improvement of 51.14%. The mean pretest score was 22.39 (SD = 6.25), while the mean posttest score rose to 51.98 (SD = 9.09). The calculated t-value of 28.41 is statistically significant at $p < 0.001$, indicating the effectiveness of the planned teaching program in enhancing knowledge about the negative impacts of electronic gadgets and strategies to address these issues.

The findings of this study are presented about the objectives and compared with the outcomes of other relevant studies. This research aims to evaluate the effectiveness of an awareness program in enhancing adolescents' knowledge about the negative impacts of excessive screen time and strategies to address these issues. The results demonstrated a significant improvement in knowledge, with a posttest mean score of 51.98 and a standard deviation of 9.09, which exceeded the table value. These findings indicate that the awareness program was highly effective in raising awareness among adolescents about the adverse effects of excessive screen time and the measures to mitigate them.

Discussion:-

The current study findings revealed the participants' significant reliance on electronic devices. A notable 55% of students reported using more than three electronic devices, indicating a high level of device engagement. Additionally, 30% of students spend over six hours per day on these devices, which aligns with the growing concern over excessive screen time among adolescents. This extended usage of electronic gadgets is concerning, as it may contribute to physical health issues such as eye strain, headaches, and disrupted sleep patterns, as well as mental health challenges like stress and anxiety.

The findings of this study are consistent with the research on the impact of electronic devices. Between 2017 and 2023, mobile phone ownership surged from 42% to 95.7%. A recent psychological study highlighted that addiction to electronic devices can be as detrimental as addiction to alcohol, particularly affecting children and adolescents. Common symptoms of this addiction include excessive gaming and social media usage. While electronic gadgets offer convenience, their overuse can lead to negative health effects, including eye strain, back problems, and cognitive impairments.^[16]

The current study showed the significant improvement in knowledge observed between the pretest and post-test highlight the effectiveness of the intervention. The pretest knowledge score was 41.38%, indicating a relatively low baseline awareness regarding the health impacts of excessive screen time. However, following the intervention, the post-test score increased dramatically to 92.52%, reflecting a substantial gain in understanding. This 51.14% increase in knowledge suggests that the educational program was highly effective in enhancing awareness among the participants. The results emphasize the importance of targeted educational efforts in improving adolescents' understanding of the potential risks associated with prolonged screen time, and the findings support the implementation of similar programs to raise awareness and promote healthier device usage behaviors.

This study result is proved by a study that evaluated the effectiveness of video-based education on the health risks associated with electronic devices among adolescents in the Kanyakumari district. Using a one-group pretest-posttest design, the researcher worked with 60 adolescents. The results indicated that the video education program effectively increased knowledge about the health hazards of electronic devices. The paired 't' test yielded a value of 9.304, with $df = 59$ and $P < 0.05$. The study concluded that video education is an effective tool in raising awareness of the health risks posed by electronic devices among adolescent girls.^[15]

Significance of the Study:-

While much of the existing research on technology addiction focuses on developed nations, there is a notable lack of studies in developing countries, particularly in smaller cities like Bangalore. This study seeks to fill this gap by providing valuable insights into the issue of technology addiction and its management. It emphasizes the impact of excessive screen time on school students, offering a fresh perspective that can inform future research and intervention strategies in similar settings.

Limitations and Future Directions:

One limitation of this study is the small sample size, which may affect the generalizability of the findings. Future research should involve a larger and more diverse sample, as well as a control group, to compare technology users and non-users. Additionally, the time constraints of this study limited its scope to a specific group of participants. Unforeseen factors could have influenced the outcomes related to social, physical, and mental health. Future studies should consider a longer duration and explore these outcomes in greater depth to gain a more comprehensive understanding of the impact of technology use.

Conclusion:-

In today's technological era, it is nearly impossible to be away from electronic gadgets. Therefore, young people need to use these devices wisely, develop life skills that gadgets cannot provide, and prepare the younger generation to take responsibility for their lives, solve problems, and contribute meaningfully to society. Based on the research findings, several recommendations were made to address the physical and mental health impacts of excessive screen time among adolescents. These include applying the 20-20-20 rule (after every 20 minutes of screen time, looking at something 20 feet away for 20 seconds), blinking more to prevent dryness, ensuring proper lighting, and maintaining a distance of 40-76 cm from computer screens and about 30 cm from mobile phones. Additionally, investing in ergonomic chairs, maintaining proper posture, taking five-minute vision breaks every 30-40 minutes, resting the arms when not typing, doing stretches, and getting up periodically to promote blood circulation are all beneficial practices. The study found an overall increase of 51.14% in knowledge scores between the pretest and posttest, demonstrating the high effectiveness of the planned teaching program in raising awareness among adolescents about the negative effects of electronic gadgets and ways to mitigate these issues.

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Conflict of Interest:

The authors declare that there are no conflicts of interest related to this work.

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