ELECTRONIC MEDIA USE AND INSOMNIA AMONG ADOLESCENTS

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ABSTRACT

The current study aimed to analyse the relationship between sociodemographic characteristics and addiction to electronic media usage among adolescents and young adults of St. Paul's Catholic University Chapel, Nairobi County, Kenya. A correlational research design was used with a sample of 101 respondents. Data was collected through self-administered questionnaires. Descriptive and correlation testes were used to analyse data with the help of Statistical Package for the Social Sciences. From the results, it is evident that addiction to internet use was fairly prevalent in adolescents, and young adults. The result indicated that the Pearson Correlation coefficient (R-value) is .710, which represented a strong positive relationship between internet use addiction and insomnia. The study concluded that adolescents' and young adults' addiction to the internet has affected their sleeping patterns, productivity and school performance. There is a need to advocate for education on and to set up guidelines for appropriate and responsible electronic media use and a similar necessity for intervention to mitigate related mental and behavioural problems in adolescents and young adults.

Keywords: Adolescents, Insomnia, Electronic media, Internet addiction.

INTRODUCTION

Adolescence marks the most riveting and intricate transition in an individual's lifespan. As per the World Health Organization's definition, adolescents and young adults are individuals between 10 and 19 years, and 20 to 25 years respectively (WHO, 2021). The release of growth hormone, which is essential for achieving the necessary developmental milestones, depends on getting enough sleep (Lin et al., 2019). However, the needs of adolescents and young adults with respect to sleep hygiene have been disregarded in low- and middle-income nations, creating a critical mental health gap. Young people's needs for mental health care are not recognized, and when they are, there are not enough qualified experts available to meet their needs.

Insomnia is classified as a sleep disorder by the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) fifth edition, and is delineated by experiencing dissatisfaction with sleep quality and duration that is associated with severe discomfort and impairment of daily functioning (American Psychiatric Association [APA], 2013). It is described as "chronic difficulties with sleep start, duration, consolidation, or quality" Idiopathic insomnia, paradoxical insomnia, psychophysiological insomnia, childhood behavioral insomnia, and drug or alcohol-related insomnia are just a few variations of the condition (Krystal et al., 2019). Common symptoms of insomnia include impaired work performance, daytime drowsiness or low energy, difficulty paying attention, depression, and anxiety. Despite research showing that teenagers require more sleep during adolescence than they did before puberty, they typically obtain less sleep

Globally, insomnia in adolescents and young adults poses a serious problem with major risks for psychological diseases such as anxiety, depression, and suicide. According to Liu et al. (2019b), sleep disruptions, early awakening, restlessness, and other symptoms of insomnia are prevalent conditions affecting 23.8% to 7.8% of young adults and teenagers respectively. Teenagers should get between 9 and 9.25 hours of sleep per night in order to perform at their best (Acebo & Carskadon, 2001). However, a minor percentage of students sleep for eight hours or more weekly, which means that the

majority of teenagers, especially older ones, experience sleep deprivation (O'Brien & Mindell, 2005). Adolescents are eight or more times more likely than children to sleep six hours or less each night and are only half as likely to sleep nine hours or more per night, as stated by Ohayon et al. (2000). Teenagers and young adults in Kenya are also significantly endangered by insomnia, as well as the lethargy and daytime impairments that it often brought with it. This constitutes a serious risk to the public's health.

Numerous studies have demonstrated a link between insomnia and adverse health outcomes, including lack of energy, weariness, headaches, back and stomach pain, obesity, and general ill health (Amaral et al., 2017). Teenagers and young adults who struggle with sleep issues such as insomnia and sleep deprivation report having poorer-quality sleep. Exam failure was a possibility for adolescents and young adults who displayed sleep-related symptoms, for example, anxiety, tension, tiredness, and daytime sleepiness. It is essential that public health policymakers develop plans to lessen the effects. De Zambotti et al. (2018) noted that insomnia disorder is associated with depression and other mental illnesses and is a risk factor for suicidality and substance use. This necessitates being aware of the pervasiveness of sleeplessness, and its impacts both in the short run and long run in relation to young people's use of electronic media. Physical, cognitive, emotional, and social changes that occur during adolescence can have a big impact on how teenagers behave and sleep. Therefore, sleep issues can also significantly affect how adolescents operate and develop during the day, with regard to growth, learning, behavior, mood, attention, memory, and academic performance, among others.

Research from different regions of the world indicates a connection between problematic electronic media use and insomnia. Electronic devices such as smartphones, video game consoles, televisions, audio players, laptops, and tablets have become much more widely available and used over the past 10 years. As evidence of this, nearly all-American adolescents (97%) have one or more electronic gadgets (Hysing et al., 2020). Consequently, electronic devices have become an essential aspect of adolescent life. Electronics play a significant role in adolescents' social lives and provide easily accessed entertainment. Nevertheless, being more active stimulating, and using social media could negatively impact sleep. Adolescents and young adults invest a significant amount of time in electronic devices (cell phones and other linked devices), especially at night. Screen time after 9 o'clock at night significantly affects academic achievement, mood, body weight, and sleep length. Numerous studies and publications have shown that young adults sleep quality has been declining over the past few years (Wang & Bíró, 2021). According to reports by Alghwiri et al. (2021), insomnia is a serious issue that raises a public health concern and can be harmful if left untreated in young people.

Unfortunately, there is limited evidence in this field. According to research by Kimuge (2021), Micheni and Muketha (2019), and Ogachi et al. (2020), adolescents and young adults in Kenya utilize electronic media, with a high prevalence of internet addiction and PIU. Comprehensive assessment of the available research found that overall, usage of electronic media has been connected to reduced sleep and postponed bedtime. However, the review identified some flaws in the available literature. The research had also not investigated whether using electronic media was related to insomnia. By examining insomnia in adolescents and young adults caused by using electronic media, this study aimed to bridge this knowledge gap.

LITERATURE REVIEW

A thorough analysis of 0-15-year-olds' usage of electronic media and sleep revealed that there is an association between using electronic media and the occurrence of sleep disorders Lund et al. (2021). The use of electronic media was shown to be associated with shorter sleep duration, with evidence being stronger for children aged 6 to 15 than for those aged 0 to 5. In another study, Varghese et al. (2021) investigated the connection between adolescents in Lombardy, Italy's most populous region, residents' use of technology and social media, such as Facebook and YouTube, and problems with falling asleep. Adolescents who used electronic devices (OR 1.50 for highest vs lowest tertial of use; 95% CI 1.21-1.85.) for: frequently playing games (OR 1.35; 95% CI 1.11-1.64), visiting social

networks more frequently (OR 1.40; 95% CI 1.09-1.81), and using YouTube more frequently (OR 2.00; 95% CI 1.50-2.66) more frequently reported having trouble falling asleep. While evaluating the link between time spent using various electronic gadgets and complaints of insomnia in German adolescents, both boys' and girls' electronic use patterns were assessed in relation to gender (Lange et al., 2017). Adolescents' insomnia complaints were linked to the regular use of electronic media devices.

A significant result was obtained when an analysis of the relationship between sleep disorders and screen time was done (PR = 3.8, 95%CI = 1.09-13.1, p = 0.02) in a study conducted during the COVID-19 pandemic aimed at determining the prevalence of sleep disturbances in teenagers and the correlation between sleep time and the incidence of sleep issues (Windiani et al., 2021). Teenagers in a Nepalese peri-urban area participated in a cross-sectional study by Karki et al. (2021) that examined the connection between internet addiction and sleep quality. The outcomes were as follows: 21.5% of the respondents had borderline internet addiction, 13.3% were at high risk, and 31% slept poorly (OR = 1.85, p = 0.022 for borderline internet addiction, and OR = 3.98, p = 0.001 for potential internet addiction) in comparison with those who had no exposure to the internet (Karki et al., 2021).

Research by Dewi et al. (2021) showed a significant relationship between using smartphones at night and sleep disturbance in teenagers (r = 0.374), coupled with a positive relationship between using smartphones at night and depressive symptoms in teenagers (r = 0.360). The average use of electronic devices in a study by Pirdehghan et al. (2021) had a negative correlation with sleep quality (Spearman's rho = 0.17; P-Value = 0.03) and a positive correlation with depression (Spearman's rho = 0.171; P-Value 0.001). Olorunmoteni et al. (2018) investigated the relationship between Nigerian adolescents' sleep patterns and their use of electronic gadgets. Respondents in the school context were given a modified version of the Adolescent Sleep Habits Survey Questionnaire utilizing the assisted self-administration technique. While female gender, early adolescence, and living in a polygamous family were independent variables of getting enough sleep on weekends in a study by Olorunmoteni et al. (2018), lower social status and non-use of computers at night were independent variables of acceptable sleep duration on weekdays. The above study concentrated on sleep patterns, whereas this study was more focused on insomnia.

METHODOLOGY
Research Design
In this study, a correlational research design was used. In a correlational research design, relationships between two or more variables are examined without any of the variables being under the researcher's direct control or manipulation (Curtis et al., 2016).

Target Population and Sampling
The study's target demographic consisted of 4000 teenagers and young adults from St. Paul's University Chapel in Nairobi, Kenya. The respondents comprised 101 adolescents and young adults aged between 13-23 years who had internet connectivity and either owned or had access to technological gadgets. As a result, communication with the respondents allowed the researcher to gather the necessary data in an efficient and effective manner. To obtain a representative sample, the sample size was determined by using a modified version of the formula created by Fisher et al. (2003) and adjusted using Cochran's formula (Barlett et al., 2001):

$$n = \frac{z^2 p(1-p)}{d^2}$$

Where z = is the Z value for the corresponding confidence level (1.96 for 95% confidence), d = is the margin of error (0.05 = ± 5%) & p = is the estimated value for prevalence of insomnia = 7.1% (Peltzer & Pengpid, 2019)

$$n = \frac{1.96^2 p(1-p) \cdot N}{d^2 \cdot 1 + N(e)^2}$$

n= 1.96 x 1.96 x 0.071 (1- 0.071) = 101.35

0.05 x 0.05

For small populations (<10,000) such as in this study, Cochran came up with a correction formula to calculate the final sample size as follows:

$n = \{ n_0 / 1 + (n_0-1)/ N \}$

$Nf = n/ (1+n/N)$

Where Nf= desired sample, n = is the required sample size, $n_0 =$ is the sample size derived earlier, N = is the population size

$n = \{101/ 1+ (101-1)/4000\} = 100.99$

The study, therefore, had a sample of 101 respondents, which translated to 2.5% of the sample which was then divided by gender by 2.5%. A Random Number Generator was used to select respondents for the study in accordance with the principles of simple random sampling, which state that every component of the population has an equal chance and likelihood of being chosen for the sample (Cohen, 2019). For this study, the researcher acquired a numbered list of all 4000 adolescents and young adults from St. Paul's Youth Group (SPY) and the Young Christian Association (YCA). The researcher instructed the Random Number Generator to pick out 101 numbers at random from a pool of 4,000. The subjects corresponding to the numbers picked were included in the sample which was then used to create a list of respondents.

Data Collection

Data was collected through self-administered questionnaires. Insomnia was assessed using the "Insomnia Severity Index" (ISI), a 7-item measure that was once called the Sleep Impairment Index. Its original components were developed due to concerns of clinical relevance and validity raised by patients seeking treatment for insomnia within a sleep disorder clinic (Bai et al., 2018). The seven answers are integrated to obtain a final score ranging from 0 to 28 that is based on a 5-point Likert scale, with 0 denoting no difficulty and 4 denoting extremely severe. The entire score is then translated into the following categories: zero (0), sub-threshold (8), moderate (15), and severe (22-28) insomnia (Veqar & Hussain, 2020). Studies by Bai et al. (2018) and Veqar and Hussain (2020) found that the ISI has a sufficient level of internal consistency and is a valid self-report measure for assessing reported sleep difficulties. Moreover, it has been used in South Africa and Nigeria. A pretest of the questionnaire was done before data collection. The goal of the pretest was to ascertain whether the respondents understood the questions and could correctly answer them. Assessing the strength of the self-administered questionnaires was also helpful. Ten percent of the target population was used. The pretest study was carried out on The Holy Family Basilica youth group which comprised adolescents and young adults between 13-23 years.

Data Analysis

Statistical Package for the Social Sciences (SPSS) program, version 27 for Windows, was used to compile and analyze the data obtained. There were two levels of data analysis. Creating descriptive statistics was done at the first level, and inferential analysis was done at the second level. The prevalence of insomnia disorder was revealed by descriptive statistics. The association between sociodemographic traits and insomnia disorder among adolescents and young adults was examined using the chi-square test. Tables and figures were used to present the results.

Ethical Considerations

Permission to undertake research was sought from the National Commission for Science, Technology, and Innovation (NACOSTI). The St Paul's University Chapel SPY and YCA moderator were contacted for permission to collect data. Parents and guardians of respondents under the age of 18 were asked for their written informed consent. Respondents' confidentiality was guarded by ensuring anonymity in the study. The researcher ensured that the respondents' information was handled with uttermost confidentiality. Only the researcher and research assistants had access to the data during the data collection process. The respondents were also allowed to opt-out if they no longer wanted to participate in the study. Furthermore, there were no monetary benefits to the respondents; although those found to have severe levels of insomnia were provided psychological help. Lastly, respondents

were counselled after data collection to handle any psychological harm that might have arisen in the process of data collection.

RESULTS
Demographic Information
A total of 90 out of 101 questionnaires were adequately filled and returned, giving a response rate of 89%. This section presents the respondents' demographic characteristics and background information. The demographic characteristics analysed and presented include the respondent's age and gender distribution. The study sought to establish information on the gender of the respondents. Gender was considered a key factor for achieving gender balance and representativeness in the wider population, increasing generalizability. Table 1 shows the findings. Findings showed that 54(60%) of the respondents were female, while 36(40%) were males , showing active involvement of both genders in the study. This gender balance was imperative, allowing responses to be obtained, especially regarding insomnia disorder among adolescents and young adults. As demonstrated in Table 1, 46 (51.1%) of the respondents were 16-18 years old, 27 (30%) were 13-15 years old, and 17 (18.9%) respondents were 19-23 years old. This indicated that the age group more influenced by parents' style of parenting and consequent insomnia disorder among adolescents was between 13 years and 18 years.

Table 1 Respondents' Demographic Characteristics

		Frequency	Percent
Gender	Male	36	40.0
	Female	54	60.0
	Total	90	100.0
Age	13-15 years	27	30.0
	16-18 years	46	51.1
	19- 23Years	17	18.9
	Total	90	100.0

Prevalence of Insomnia
The study sought to establish the severity of Kenyan adolescents and young adults' insomnia. The respondents were asked to rate their struggles with insomnia and the results are depicted in Table 2. From the study findings, 13(14.4%) of the respondents indicated that they had no difficulty falling asleep, 20(22.2%) had mild difficulty falling asleep, 15(16.7%) had a moderate problem falling asleep, and 39(43.3%) experienced severe and 3(3.3%) experienced very severe problems falling asleep. Furthermore, 18(20%) respondents stated that they did not experience difficulty staying asleep, 21(23.3%) experienced mild difficulty staying asleep, and 17(18.9%) experienced moderate difficulty in staying asleep. Nonetheless, 34(37.8%) experienced severe difficulties staying asleep. On the metric of waking up too early, 17(18.9%) respondents had a moderate problem with waking up too early, while 34(37.8%) had a severe and very severe problem of waking up early, whilst only a few of the respondents, 18(20%), had no challenge waking up too early, while 21(23.3%) had mild difficulty waking up early in the morning.

Table 2 Severity of the Adolescent and Young Adult Insomnia Problem

	N/%	None	Mild	Moderate	Severe	Very severe	Total
Difficulty falling asleep	N	13	20	15	39	3	90
	%	14.4	22.2	16.7	43.3	3.3	100
Difficulty staying asleep	N	18	21	17	25	9	90
	%	20.0	23.3	18.9	27.8	10.0	100
Problems waking up too early	N	9	8	24	33	16	90
	%	10.0	8.9	26.7	36.7	17.8	100

Severity of Sleeping Problems
This study aimed to establish the level of adolescents and young adults' satisfaction with current sleeping patterns. From the findings , majority of the respondents 34(37.8%) indicated they are

moderately satisfied with their sleeping pattern, while 13(14.4%) and 14(15.6%) were very satisfied and satisfied respectively with their sleeping pattern. From the study findings, 26(28.9%) of the respondents indicated that their sleeping problem has not been noticed as a big issue by other people, 23(25.6%) revealed it was noticed a little by a few people, 20(22.2%) indicated it was somewhat noticeable to the people surrounding them, and 21(23.3%) indicated their sleeping problems were greatly noticeable by other people. As shown in Table 3, the study found that the sleeping problem did not distress/worry the adolescents and young adults at all, represented by 29(32.2%). Of the respondents, 24(26.7%) were worried to a little extent about their sleeping problem, while 21(23.3%) were somewhat worried about their sleeping problem. From the study findings, 24(26.7%) respondents indicated that their sleeping problem did not interfere with their daily activities, 24(26.7%) said that their sleeping problems affected their daily activities a little bit, and 23(25.6%) said it somewhat affected their daily activities. Of the respondents, 17(18.9%) said their sleeping problems affected their daily function to much extent and 2(2.2%) indicated it interfered very much with their daily activities.

Table 3 Severity of Sleeping Problems

		Frequency	Percent
Satisfied/dissatisfied with sleeping pattern	Very satisfied	13	14.4
	Satisfied	14	15.6
	Moderate satisfied	34	37.8
	Dissatisfied	22	22.4
	Very dissatisfied	7	7.8
	Total	90	100.0
Extent to Which the Sleep Problem is Noticeable to Others	Not at all noticeable	26	28.9
	A little	23	25.6
	Somewhat	20	22.2
	Much	12	13.3
	Very much noticeable	9	10.0
	Total	90	100.0
Extent of Respondents' Worry/Distress about their Current Sleep Problem	Not at all worried	29	32.2
	A little	24	26.7
	Somewhat	21	23.3
	Much	14	15.6
	Very much worried	2	2.2
	Total	90	100.0
Extent to Which Sleeping Problem Interferes with Respondents' Daily Functioning	Not at all interfering	24	26.7
	A little	24	26.7
	Somewhat	23	25.6
	Much	17	18.9
	Very much interfering	2	2.2
	Total	90	100.0

Association of Demographic Characteristics and Insomnia

Chi-square tests were used to compare gender, age with prevalence of insomnia. Results in Table 4 shows that gender was significant ($p=0.006$). Risk analysis showed that female respondents were 2.4 times more likely to experience insomnia compared with male respondents. However, age was not significant ($p=0.0200$).

Table 4 Association of Demographic Characteristics and Insomnia

	$\chi2$	df	p
Gender	10.804	1	0.006
Age	4.505	2	0.200

Electronic Media Usage

To determine the extent to which electronic media use affects adolescents and young adults, the researcher carried out IAT. The total IAT score is the sum of the ratings given by the respondents for the 20-item responses. Each item is rated on a 5-point scale ranging from zero to five, with a maximum score of 100 points. The higher the score is, the higher the severity of internet addiction. Total scores that range from 0 to 30 points reflect a normal level of internet use; scores of 31 to 49 indicate a mild level of internet addiction; 50 to 79 reflect a moderate level; and scores of 80 to 100 indicate a severe dependence on the internet. The findings are presented in Table 5. From the IAT results, the majority, 46(51.1%), of adolescents and young adults who participated in this study displayed a moderate level of internet usage addiction, 26(28.9%) had a mild level, 10(11.1%) had a normal level, and 14(15.6%) were severely dependent on the internet.

Table 5 Electronic Media Usage

	Frequency	Percent
0-39	10	11.1
31-49	20	22.2
50-79	46	51.1
80-100	14	15.6
Total	90	100.0

Relationship between Addiction to Electronic Media Usage and Insomnia Disorder among Adolescents and Young Adults

Pearson's Correlation Coefficient was calculated at a 95% confidence level since the goal of the study was to determine the strength of the relationship between the independent and dependent variables (error margin of 0.05). The study's results are shown in Table 6 As shown in Table 6, the p-value for internet usage addiction was found to be .000, which is more than the significant level of 0.05 ($p<0.05$). The result indicated that the Pearson Correlation coefficient (R-value) is .710, which represented a strong positive relationship between internet use addiction and insomnia. The study concluded that internet use addiction had a strong positive relationship with insomnia.

Table 6 Correlation of Electronic Media use with Insomnia

Correlations			
		internet usage addiction	Insomnia
internet usage addiction	Pearson Correlation	1	.710[*]
	Sig. (2-tailed)		.000
	N	90	90
Insomnia	Pearson Correlation	.710[*]	1
	Sig. (2-tailed)	.000	
	N	90	90

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

DISCUSSION

The study found that internet use addiction had a strong positive relationship with insomnia. This is similar to findings of Kariki et al. (2020) who revealed that excessive internet use among adolescents and young adults resulted in later bedtimes and subpar sleep. Higher screen time among adolescents and young adults was also linked to later bedtimes and less overall sleep in over 90% of current studies in a study by Gozal (2017). Exorbitant and unbridled use of electronic gadgets and the internet may lead to detrimental psychological problems. The hours spent using electronic devices predicted psychological distress in adolescents, who are found to rely on electronic devices for mood modification as the brain's reward system releases endorphins and dopamine in response to exposure to electronic media and the internet. Incidentally, this contributes to addiction, proven by the fact that symptoms of psychological disorders like insomnia cause impulsivity similar to that found in substance addiction disorders.

CONCLUSIONS

From the study findings, it was concluded that social and electronic media use has a great impact on adolescents and young adults. The relationship between internet use and insomnia disorders is positive. Adolescents' and young adults' addiction to the internet has affected their sleeping patterns, productivity and school performance. Lastly, as per the correlation analysis, this study concluded that internet use addiction had a strong positive relationship with insomnia. There is a need to advocate for education on and to set up guidelines for appropriate and responsible electronic media use and a similar necessity for intervention to mitigate related mental and behavioral problems in adolescents and young adults. Furthermore, parents should limit the hours of electronic device use, and schools should educate students about its impact, ensuring to use strict measures to teach healthy habits to limit the total time spent on electronic devices.

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