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Original Research Article

Screen addiction and associated factors among grade-10 school children in Nuwaragampalatha- east educational zone in Anuradhapura, Sri Lanka

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ABSTRACT

Background: Screen addiction has become a significant concern among school children in recent years due to the widespread use of digital devices such as smartphones, tablets, and computers. The objective was to assess the prevalence of screen addition and associated factors among grade 10 students in Nuwaragampalatha- east educational zone in Anuradhapura, Sri Lanka.
Methods: A cross-sectional descriptive study was carried out among students studying in grade 10. Sample size was 318. Three schools selected randomly from Type 1AB, IC and type 2 categories and proportionate to the number of students in grade 10, sample was recruited from each school. Study instruments comprised Internet addiction test, Perceived stress scale and an interviewer administered questionnaire. Multivariate logistic regression was utilized to identify associated factors of screen addiction. Probability <0.05 was selected as the significant level. The results were expressed as odds ratios (OR) and 95% confidence intervals (CI).
Results: Response rate was 100% (N=318). Mild screen addiction was reported among 29.6% (95% CI=24.6-34.9) and 20.1% (95% CI=15.9-25.0%) showed moderate level while 1.6% (95%CI=0.5-3.6) had severe addiction. Half of the students (n=155) with no screen addiction. Male sex (AOR=1.9; 95% CI=1.1-3.3; p=0.021), spending more than two hours with social media (AOR=6.1; 95% CI=3.5-13.5; p<0.001), moderate and high stress levels (AOR=3.9; 95% CI=2.3-7.0; p<0.001) and not engage in physical exercises > one hour per day (AOR=2.4; 95% CI=1.2-4.8; p=0.014) were found to be associated factors with screen addiction.
Conclusions: More than half of the students had some form of screen addiction. Except sex, other associated factors are modifiable.

Keywords: School children, Screen addiction, Stress

INTRODUCTION

Screen addiction is the excessive uncontrolled and obsessive media consumption using screen media devices.[1] Screen time could become an addiction which damages health and relationships if it's not kept under control. The use of the internet and digital devices are becoming more prevalent nowadays hence addictive among many school children. Students use screens for playing video games, entertainment, educational purposes, as well as for communication. Spending more time with these devices affect their physical and psychological wellbeing.[2]

Screen addiction is characterized by compulsive need to use electronic devices such as smartphones, tablets, computers and televisions. Due to the fact of high interactivity in modern world and the stimulatory effect of the devices, most of the people including school children are liable to addiction to the screen.

Even though modern technology is useful in a competitive world if used productively, excessive use of screen could negatively affect the person's mental and physical well-being. Eye strain, blurred vision, headache, neck pain are some physical effects while insomnia, stress and even depression are some of the reported psychological effects.

Screen addiction among school children

Screen addiction among school children has become a significant concern in recent years due to the widespread use of digital devices such as smartphones, tablets, and computers. With the increasing availability of digital devices and internet access, screen addiction is becoming more prevalent among school-age children. Many children start using digital devices at a young age, which can contribute to the development of addictive behaviors. Easy access to digital devices, peer influence, a way to escape from real life problems or stress and distraction by attractive reward systems are found to be some causes for screen addiction.

Many studies are conducted throughout locally and globally to assess screen addiction. The prevalence of internet addiction was found to be 17.2% among 15-19 year old adolescents in Colombo district in Sri Lanka.[3] An Indian study revealed that two third of the participants exceeded the screen time more than two hours per day.[4] Prevalence of screen time was reported as 70.9% in a systematic review conducted in Brazil in 2017.[5] Digital addiction of students of the university entrance was reported as 33.1% in Bangladesh.[6] Screen time has risen during COVID-19 pandemic due to enforcement of the public health protocols by the government. Hence screen addiction might be an upsurging trend in countries where there are no preventive programmes in this regard.

Associated factors of screen addiction

Screen addiction among adolescent school children can be influenced by several factors, both individual and environmental.

Many personality attributes such as low self-esteem, submissiveness, introversion and hostility are associated with higher tendency to screen addiction.[7,8] Even though failure in management of emotions in favour of screen addiction, responsibility and friendliness are shown to be against the screen addiction.[8,9] Screen addiction is reported as a form of escape specially who have suffered childhood trauma and loneliness.[10,11] On contrary, adolescents with higher psychological security, self-control and good guidance are reported as lesser screen addiction than others.[12,13]

School environment plays a big role in preventing school children from screen addiction. Maintaining a good relationship with peers and teachers and less stress, academic success and physical activity lowers the risk of screen addiction.[14] However, as a transitionary age, adolescents are more likely to test new things and more prone to development of screen addiction.[15]

Negative consequences of screen addiction

The stress level among adolescent school children is found to be at a high compared to childhood.[16] The lights and stimuli from the screens will increase the cortisol level in our body which increase the stress and thereby dysregulates the body and mind. As a result, they become angry, impulsive and aggressive.

Screen addiction reduces interaction with other people in real life, which affects the level of good hormones like serotonin, dopamine, oxytocin and endorphins in adequate amounts. These hormones are required for a healthy lifestyle. Hence overuse of screen will be a drawback in the development and maintenance of healthy psycho physiological state.

In a cross-sectional study in India, it was revealed that 12% had depression and 8% restless and irritable when they stop using the devices.[17] Another study from Canada reported that 43.7% of high school students who are using social media for 3 or more hours per day had psychological distress.[18]

Justification

Many studies conducted throughout globally evidenced the linkage between screen addiction and negative health consequences, sleeping disturbances and negative academic performance.[19]

With COVID pandemic, screen usage has gone up especially among school children. In addition to the proportion who used the screens since earlier, for educational purposes almost every child has to spend several hours in front of a screen. Even though now again school children are coming physically to gain education from schools, most of the school children still spend hours in front of a screen. Despite Anuradhapura is a rural area, there is not much difference in this regard.

Grade 10 students are individuals who face a major barrier exam in their life at the end of the year. They must focus more on their studies in midst of these challenges to exhibit a higher performance. With peer pressure, most of these students are more prone to get addicted to the screens. As there are many bad consequences that occur with excessive screen and internet usage, it is a timely

requirement to identify the gravity of this issue to take strategies to rectify it.

Although there are many studies done globally, in Sri Lanka very few studies have been carried out on this regard. Hence this study is carried out to assess the prevalence and associated factors of screen addition among grade 10 students in Nuwaragampalatha- east educational zone in Anuradhapura Sri Lanka.

This study aimed to assess the prevalence and associated factors of screen addiction and stress level among grade 10 school children in Nuwaragampalatha- east educational zone in Anuradhapura.

METHODS

A descriptive cross-sectional study was carried out in January to May 2024. Grade 10 adolescent school children who attend state schools in Nuwaragampalatha-east educational zone in Anuradhapura district, Sri Lanka were the study participants. Students with physical and mental disabilities were excluded. The sample size was calculated by considering the prevalence of 25%, desired level of precision as 5% and 95% desired level of confidence resulting in the sample size of 289. A further adjustment to the sample size was made considering a non-response rate of 10%, making the final sample 318. Hence 318 grade 10 school children were enrolled in the study. To represent each category of the school types which grade 10 students are studying, chosen one school randomly from type IAB, type IC and type 2 out of the school list available in the study setting. Proportionate to the number of students in each school, the final sample size of 318 was selected as 191 from type IAB (out of 5 grade 10 classes), 95 from type IC (out of 3 classes) and 32 from type 2 school (out of one class).

Internet addiction test (IAT), perceived stress scale (PSS) and an interviewer administered questionnaire used for the data collection in the study. IAT is one of the diagnostic instruments used worldwide which is produced by Kimberly Young in 1998.[20] This questionnaire is validated in Sri Lankan context which demonstrated four factor model with good model indices (RMSEA of 0.06, CFI of 0.93, NNFI of 0.91, SRMR of 0.063, GFI of 0.77) and internal consistency with Cronbach Alpha value of 0.782.[21] There are 20 items which are rated on a 5-point Likert scale ranging from 1 to 5.

PSS is used to assess perceived stress among individuals.[22] It consists of 10 items and rated on a five-point Likert scale ranging from 0 to 4. The PSS questionnaire is validated in Sri Lankan context.[23] Interviewer administered questionnaire consists of socio demographic factors, factors related to the school, and use of Internet and digital devices. The face and content validity of the interviewer administered questionnaire was assessed with subject experts. Data were collected by investigators after obtaining the administrative clearance and permission from principals of the respective schools. In addition to written informed consent of parents, assent (verbal) from all the study participants was obtained. A second visit was conducted to gather data from the absent students on the first data collection date. Ethical approval for the study was obtained from the ethical review committee, faculty of medicine, Wayamba University of Sri Lanka.

Data analysis

The data is analyzed using Statistical Package for Social Sciences (SPSS) software version 26.0. All the categorical variables were computed as proportions and expressed as percentages and respective 95% confidence intervals (95% CI). Quantitative data were described as mean and standard deviations (SD).

According to the scoring system, each respondent's Internet addiction score and perceived stress scale were calculated. According to the Internet addiction test scoring, the maximum score is 100 points. The higher the score is, the higher the severity of addiction. Four levels of addiction were described as normal (0 to 30 points), mild addiction (31-49), moderate (50-79) and severe dependence (80-100) points. In perceived stress scale, scores were summated to obtain a final score and were used to calculate the perceived stress levels. Perceived stress scores between 0 and 13 were considered 'low', 14-26 as 'moderate' and 27-40 as 'high' perceived stress levels.

Multiple logistic regression was carried out to identify factors associated with screen addiction after controlling for confounding factors. At 5% significance level, the results were expressed as odds ratio (OR) and 95% confidence interval (CI). Goodness of fit was confirmed using Hosmer-Lemeshow test.

RESULTS

There were 318 participants, and the response rate was 100%.

Table 1: Sociodemographic factors of the sample.

Sociodemographic factors		Number (%)
Age (years)	14	123 (38.7)
	15	194 (61.0)
	16	01 (0.3)
Gender	Male	158 (49.7)
	Female	160 (50.3)
Ethnicity	Sinhala	314 (98.7)
	Tamil	04 (01.3)
Religion	Buddhism	304 (95.6)
	Christian	10 (03.1)
	Hindu	04 (01.3)
Monthly income	<100,000 rupees	264 (83.0)
	≥100,000 rupees	54 (17.0)

Fifty percent of the students (n =160) were females and mean age of the participants was 14.6 years (SD=0.49). Majority of them were Sinhalese (99.7%; n=317) and Buddhists (95.6%; n=304). The majority (83%; n=264) of their parents' monthly income was less than 100000 rupees (Table 1).

Level of screen addiction

One third of the students (29.6%; n=94) showed mild level of screen addiction. Furthermore, 64 students (20.1%) demonstrated moderate level of addiction whereas only 1.6% (n=5) had severe dependence upon screen (Table 2). Amalgamating moderate and severe addiction into screen addiction, 21.7% showed screen addiction among grade-10 school children in Nuwaragampalatha- east educational zone in Anuradhapura, Sri Lanka. Screen addiction was more prevalent among males (56%; n=92) than females (44%; n=71).

Table 2: Level of screen addiction among grade 10 school children in Nuwaragampalatha- east educational zone.

Level of screen addiction	IAT score	Frequency (%)	95% CI
No addiction	0-30	155 (48.7)	43.1-54.4%
Mild addiction	31-49	94 (29.6)	24.6-34.9%
Moderate addiction	50-79	64 (20.1)	15.9-25.0%
Severe addiction	80-100	05 (01.6)	0.5-3.6%

Stress level of grade 10 school children

The stress level among grade 10 students is assessed with perceived stress scale. Accordingly, majority (67.6%; n=215) of the grade 10 students were having moderate level of stress. Nearly one fourth of students (n=75) had low level of stress and only 8.8% (n=28) had severe stress level (Table 3).

Table 3: The stress level of grade 10 school children in Nuwaragampalatha- east educational zone.

Stress level	PSS score	Frequency (%)	95% CI
Low	0 - 13	75 (23.6)	19.0-28.6%
Moderate	14 - 26	215 (67.6)	62.2-72.7%
Severe	27 - 40	28 (8.8)	05.9-12.5%

The stress level among males was slightly (51%; n=124) higher than that of females (19%; n=119).

There was a positive correlation (r=0.55) between stress level and the screen addiction of grade 10 school children. This correlation was significant (p<0.001).

Multivariate logistic regression analysis showed male sex (AOR=1.9; 95% CI=1.1-3.3; p=0.021), spending time more than two hours with social media (AOR=6.1; 95% CI=3.5-13.5; p<0.001), moderate or high stress level (AOR=3.9; 95% CI=2.3-7.0; p<0.001) and not engage in physical exercises > one hour per day (AOR=2.4; 95% CI=1.2-4.8; p=0.014) were found as a significant associated factors with screen addiction (Table 4). Among associated factors of screen addiction, except sex, all others are modifiable.

Table 4: Associated factors of screen addiction among grade 10 students (N=318).

Variables		Odds ratio	95% CI	P value
Sex	Male	1.9	1.1-3.3	0.021
	Female	1.0		
Time spends with social media	≥2 hours	6.1	3.5-13.5	<0.001
	<2 hours	1.0		
Stress level	Moderate and high	3.9	2.3-7.0	<0.001
	Low	1.0		
Engage in physical exercises	<one hour	2.4	1.2-4.8	0.014
	≥one hour	1.0		

DISCUSSION

The prevalence of screen addiction among grade 10 adolescent students of Nuwaragampalatha- east educational zone in Anuradhapura reported from this study (21.7%) was not much different than that score reported from research conducted among 15-19-year-old adolescent in Colombo district (17.2%) in Sri Lanka in 2019.[3] However, in this study, 49.7% (n=158) of students spent more than 2 hours per day with screen using social media. In a study conducted in Bangladesh among university students the digital addiction was reported as 27.1%.[6] However, the prevalence of excess screen time among secondary school children was reported as 83.2% in a study conducted in rural India.[24] In another study in India, the prevalence of excess screen time was reported as 61.8%.[25] The prevalence of screen time among Brazilian adolescents was reported as 70.9%.[5] This concludes the fact that internet addiction varies in different contexts and so does the excessive screen time. The difference in the socio-economic changes as well as study instruments and scoring mechanism might be the underlying cause for this range. However, according to the findings of this study, more than one fifth of the student population is addicted to screens overall.

The present study revealed that the male sex is a risk factor for screen addiction (AOR=1.9; 95% CI=1.1-3.3; p=0.021). Males were more prone to screen addiction which corroborate with several other studies.[26,27] This fact is consistent throughout the literature. It might be due to fact that male students are keen on exploring and trying to find out new things than girls hence they use internet and

screen for this purpose without knowing that they are addicted to it. In a Sri Lankan study also this male predominance in internet addiction was reported (AOR=2.27; 95% CI:1.27-4.07).[3] Same finding was reported in a study done in India (AOR 1.69, 95% CI=1.081-2.65, p=0.021).[27] However, contrary to this finding, a study done in China[28] and Turkey[29] revealed that female college students were having significantly higher internet addiction than male.[28,29]

Adolescents are among the biggest consumers of social media. With available modern digital devices, these adolescent school children used to scroll down social media for hours and hours exploring new people and new facts. In Sri Lanka, especially after COVID-19 pandemic, the school children are facilitated with digital devices with internet facilities more than earlier for their educational activities which was a bonus for the students to hang around with social media more frequently. In the present study it revealed that spending time more than two hours with social media is associated with screen addiction (AOR=2.8; 95% CI=1.3-5.8; p=0.007).

The majority (67.6%; n=215) of students demonstrated moderate level of perceived stress in the present study similar to the findings of several other srtuides.[30,31] However, nearly one tenth of students (n=28) had severe stress level in this study. The students in grade 10 are facing a high academic workload. Engaging screen for a long period enhances the stress level among these students. More male students (51%; n=124) were found to experience moderate to high level of stress compared to the girls. Same results revealed in several studies.[30,32] It is emphasized that moderate or high stress level is associated with screen addiction (AOR=1.2; 95% CI=1.1-1.3; p<0.001) in this study.

According to the present study, the odds were 2.4 (AOR=2.4; 95% CI=1.2-4.8; p=0.014) times higher to have a screen addiction among grade 10 students who did not engage in physical activities at least one hour per day with comparison to those who did. The NHS guidelines recommended that children aged 5 to 18 should be engaged with at least 60 minutes of moderate or vigorous physical activity a day across the week. When a student gets addicted to screens, obviously there will be a reduction in physical activity. This fact was emphasized in several other studies as well. Strengthening this fact, a study done in China revealed that the significant negative predictive effect of physical activity on Internet addiction among college students (p<0.01).[28] Further, aligning with this, a meta-analysis revealed that sports and combined intervention, had significant effects on reducing internet addiction among youth.[33] A student engaged in physical exercises occupies the time that could be spent on internet, which will bring positive physical and psychological satisfaction resulting in a healthy life.

However, the number of hours spent with internet, monthly income of the family, sleep and socioeconomic status are found to be not significantly associated with screen addiction in the present study in multivariate logistic analysis.

With regard to assessment of associated factors, confounding has been controlled by applying multiple logistic regression which may be considered a strength of the study. The narrow confidence interval of associated factors of the screen addiction suggests high precision which is also a strength of the study.

It was not possible to assess temporal association with regard to cause and the effect as this was a descriptive study which is a limitation inherent to the study design

CONCLUSION

The findings of the present study revealed screen addiction is a significant problem among grade 10 students. This finding underscores the need to implement a remedial measure to reduce screen addiction as students are the future of a nation. It is imperative to practice those measures in early childhood to prevent the younger generation from serious repercussions of screen addiction.

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