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The Extent of Smartphone Addiction and Its Impact on Educational Outcomes Among Sri Lankan Advanced Level Students in the Adolescence Stage

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ARTICLE INFO	ABSTRACT
	Introduction: Smartphone addiction has become a growing concern, especially among students. It refers to excessive and uncontrollable smartphone use that can negatively affect daily life, including academic performance. **Objectives**: This study examines how widespread smartphone addiction is among Sri Lankan Advanced Level (A/L) students and how it affects their studies. **Methods**: To gather data, researchers selected 506 students from 1AB schools in the Colombo Education Zone. They used the Short Version of the Smartphone Addiction Scale (SV-SAS) along with a questionnaire created to assess smartphone usage habits and self-reported academic performance. **Results**: The responses reveal that a significant number of A/L students show signs of smartphone addiction. More importantly, there is a clear negative link between high addiction levels and lower academic performance. Male students were discovered to be more prone to smartphone addiction than female students. On the other hand, many students were unaware of their addiction, which highlights the need for proper awareness on this issue. The study also examined how addiction levels vary among different groups of students and how this impacts their academic success. **Conclusions**: These results point to an urgent need for targeted strategies to help students manage their smartphone use while ensuring they stay focused on their education. **Keywords:** Smartphone Addiction, Academic Performance, Sri Lankan Advanced Level Students, Adolescence stage.

INTRODUCTION

The use of smartphones has grown extensively among teens, who face significant impacts in both academic work and their social activities. Digital technology continues to advance rapidly, which causes students to use smartphones more frequently for academic needs, communication, and recreational purposes. Multiple helpful features on these devices include access to educational materials, but students may start developing distractions, diminished academic interest, and dependencies from extended use. Thus, students deal with uncontrolled screen time, which produces adverse results that harm their academic achievement and personal health (Strøm, 2021). Previous research conducted in other countries, exploring smartphone addiction in adolescents, has mainly focused on university students and widespread adolescent groups. Hence, due to the limited availability of such research about how smartphones affect Sri Lankan students during their adolescence stage, this research would address the research gap. Adolescents in the Advanced Level classes find themselves in an essential educational period determining their university entrance for free tertiary education and future employment career paths. Current research deficits about smartphone addiction among Sri Lankan Advanced Level students maintain an information gap about the extent of addiction severity and associated academic deterioration. The research addresses this knowledge deficit by

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systematically evaluating smartphone addiction levels among Sri Lankan adolescents and their consequences on academic achievement.

The following are the three major objectives expected to achieve from this timely vital study.

- To determine the prevalence of smartphone addiction among adolescence in the Advanced Level classes using the Short Version of the Smartphone Addiction Scale (SV-SAS) and self-reported assessments.

- To examine gender differences in smartphone addiction and analyze discrepancies between self-reported and actual smartphone addiction levels.

- To investigate the relationship between smartphone addiction and educational outcomes, including self-reported academic achievement and the perceived impact of smartphone use on education, using statistical analysis.

The research delivers factual results about smartphone addiction's impact on A/L students' academic achievements. The study reveals important influences of addiction, which provides essential knowledge to educators, policymakers, and parents. The collected data will help guide the creation of intervention strategies that promote healthy smartphone utilization, and further,the students will gain the educational technology benefits. Digital literacy programs and responsible smartphone usage guidelines should be used to guide school and education institutional policies. Moreover, future researches about smartphone utilization in education can be built from this study to explore integration opportunities without academic or psychological deterioration.

LITERATURE REVIEW

The increasing prevalence of smartphone addiction has raised concerns about its impact on students' academic performance, cognitive functions, and overall well-being. Researchers have extensively examined the negative consequences of excessive smartphone use among secondary school and university students. This review synthesizes findings from previous journal articles, incorporating studies conducted in Sri Lanka and other countries.

A research study conducted in Sri Lanka using undergraduate students of the University of Kelaniya has revealed that excessive use of smartphones has created a multitasking ability which has impacted on academic performance (Praveeni et.al, 2020). Similarly, another research conducted in Sri Lanka has elicited smartphone addiction has linked with issues such as physical, psychological, and behavioral problems. This research was conducted using group of adolescents aged 16-17 in the Piliyandala Education Zone revealing these issues included : reduced physical activity, mental health challenges and diminished academic performance respectively (Chathuranga et.al, 2020). Further, another study conducted using Sri Lankan School children in North Central Province has identified that peer influence and the availability of smartphones are factors leading to smartphone addiction. This study also proves that there is a negative impact of smartphone addiction on academic achievements (Gunawardena et.al, 2016). The research by Perera (2021) revealed that Sri Lankan university students who spent too much time on their smartphones for non-tutorial activities exhibited decreased study performance thereby reduced examination results . This research particularly targeted students who resided across Colombo and Kandy districts. It was clear that students addicted to social media applications obtained inferior academic performance in comparison to other students.

In the same way, it is not only Sri Lanka: the same applies to other countries as well. Research demonstrates that students experience declining academic results because of their excessive smartphone usage. University students from Lebanon demonstrated diminished academic performance when their smartphone addiction levels rose (Hawi and Samaha, 2016). Further, Lepp et al. (2015) researched how American college students whose smartphone usage frequency was high exhibited poor academic results because they mismanaged their time and were easily distracted (Lepp et al. (2015). Hence, studies have continuously documented negative effects on cognitive processes related to smartphone addiction. Kwon et al. (2013) discovered that overuse of smartphones causes people to lose attention control while also harming their memory capabilities and making their cognitive operations slower (Kwon et al. 2013). According to Mohammad and colleagues (2015) students in the UK experienced reduced classroom concentration because of frequent smartphone digital interference resulting in diminished comprehension levels

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(Mohammad et al. 2015). Moreover, Chinese high school students were evaluated by Chen et al. (2020) regarding their smartphone addiction using SAS questionnaires and cognitive tests to explore their cognitive control performance (Chen et al. 2020). Excessive smartphone usage led to both diminished control over impulses and weakened problem-solving capacities according to the study results which resulted in decreased learning performance.

In fact, student psychological distress grows sharply because of their addiction to smartphones. Rozgonjuk and Elhai (2019) discovered smartphone addiction creates direct positive relationships between anxiety and depression alongside stress levels in American university students (Rozgonjuk and Elhai, 2019). The research conducted by Bianchi and Phillips (2005) regarding mobile phone usage among Australian adolescents showed it leads to greater loneliness in addition to decreased real-world social contact (Bianchi and Phillips, 2005).

Students in Lebanon had higher anxiety and sleep troubles because of their smartphone addictions (Hawi and Samaha, 2016). This created further obstacles in their academic performance.

Multiple academic investigations examined the way students spend time in front of screens as well as their impact on educational participation. Junco and Cotten (2012) analyzed American university students and detected a link between heavy smartphone use for social media and games to decreased academic dedication and reduced study session time (Junco and Cotten, 2012). The research of Rozgonjuk et al. (2018) focused on Estonian secondary school students to discover that students who used their smartphones excessively for things unrelated to school work tended to procrastinate and achieve worse school grades (Rozgonjuk et al. 2018). According to research by Arumugam and team, university students benefit from smartphones to access educational material but long-term smartphone overuse results in both disturbed sleep patterns and diminished study effectiveness (Arumugam et al. 2020).

The field of research has investigated different solutions to address smartphone addiction-related negative consequences. According to Demirci et al. (2015), educational institutions should offer digital detox programs and time-management applications that help students control their technology engagements to enhance their academic results (Demirci et al. 2015). The research by Limniou (2021) analyzed how students benefited from regulated smartphone use through self-regulation strategies because this practice improved their academic results (Limniou, 2021). Research by Alenezi (2017) focused on measuring how smartphone usage awareness programs helped A/L students in Saudi Arabia (Alenezi, 2017). Workshops about proper smartphone usage alongside digital literacy education led students to perform better academically while developing improved monitoring capabilities of their screen time.

Self-Regulation Theory (SRT), proposed by Zimmerman (2000), emphasizes an individual's ability to control their thoughts, emotions, and behaviors to achieve long-term goals. In the context of smartphone addiction, students with poor self-regulation skills may struggle to limit their screen time, leading to excessive non-curricular smartphone use that negatively impacts their academic performance. Research suggests that self-regulation strategies, such as goal setting and time management, can help students reduce smartphone dependency and improve learning outcomes (Panadero, 2017).

However, multiple research studies demonstrate that student smartphone addiction negatively impacts their school results alongside cognitive performance and mental health status. Multiple studies conducted in Sri Lanka together with other nations show that educational programs need to be established to improve responsible smartphone usage among students. More research is needed to discover sustainable methods for controlling digital interruptions but still making good use of smartphones for academic purposes. Educational institutions should adopt a digital literacy curriculum to teach responsible smartphone engagement that converts computers into tools of academic success rather than distractions.

METHODS

To achieve the objectives of this timely crucial research study was designed primarily as quantitative study. The detailed information on sample size, selection of sample, research instruments, methodology of analysis of data and ethical procedures will be covered under this section. A quantitative research design was used to analyze smartphone addiction levels among Sri Lankan Advanced Level students along with their academic performance impacts. The

research method provided systematic objective data analysis and facilitated the identification of statistical relationships among key variables. The established methodology helped measure both the extent of smartphone addiction among students and the effects of addiction on their academic standards.

The study was done using a sample of 506 students of Grade 12 Advanced Level first year students from six government schools which have been categorized as 1AB National Schools by the Ministry of Education Sri Lanka. As per the 2023 Annual Report of Telecommunications Regulatory Authority of Sri Lanka, the highest number of registered smartphone users are located in the Colombo District of Western Province Sri Lanka. Considering this fact, the Colombo Education Zone was selected as the sample site. Similarly 1AB schools were selected, as these schools only have all six Advanced Level streams, including biological science, physical science, commerce, arts, technology, and common. This proves that sample taken from these schools has a vast diversity among students of the sample sample.

The research study included three boys' schools, two girls' schools, and one mixed-gender school in the Colombo Education Zone. Random sampling techniques were used to achieve research reliability because students from various schools had been selected to ensure representative results.The students were selected from six different Advanced Level streams from diverse schools, which allowed the study to obtain extensive insights into smartphone usage.

The researchers used a structured questionnaire that students self-administered to gather primary data about their smartphone usage, academic results, and smartphone-related educational performance opinions. The questionnaire comprised six sections - demographic information, parental education and employment information, personal interests, smartphone usage, educational performances, and relationship of these participants with their parents, siblings,peers and relations.

The research employed the Short Version of the Smartphone Addiction Scale (SV-SAS) developed by Kwon et al. (2013) which is a well established tool to measure smartphone addiction. The SV-SAS measures problematic smartphone uses through ten items, which evaluate compulsive behaviour, withdrawal symptoms, and their interference with daily activities. The survey included a six-point likert scale that ranged between 1 (Strongly Disagree) and 6 (Strongly Agree). The established cut-off values by Kwon et al. (2013) show that male participants scoring 31 or higher and female participants scoring 33 or higher demonstrate high risks for smartphone addiction.

Researchers translated the SV-SAS and prepared questionnaire into Sinhala for Sri Lankan participants to enhance comprehension accuracy. The translated instrument was tested during a pilot study involving 70 randomly selected students to confirm both linguistic clarity and instrument reliability. The validation process identified and resolved possible misconceptions, strengthening the clarity of responses. The questionnaire, including the SV-SAS, received complete validation checks after the translation work to maintain consistency and effective measurement of planned variables.

The platform used for research data analysis was SPSS 26.0, which social scientists prefer for statistical analysis. Possible statistical tests examined the relationship between smartphone addiction and academic performance. The final analysis, using chi-square tests, evaluated whether smartphone addiction had a meaningful impact on students' academic achievement levels. The Chi-square test is a statistical method that uses non-parametric analysis to locate vital relations between two categorical variables. The research applied chi-square tests to identify whether there is a statistically significant relationship between smartphone addiction and self reported academic achievements and its impact on education. The study applied Chi-square analysis and descriptive statistics to present data about student smartphone addiction prevalence through mean values, frequencies, and percentages. The research provided important insights regarding how frequently students were addicted to smartphone , differences of smartphone addiction between male and female students, and impact of smartphones on academic achievements and education.

The research obtained ethical approval to uphold research ethical standards while protecting participant rights. The Ethical approval was obtained from the Open University Ethical Review Committee (Reference Number : ER/2023/031). In addition the approvals were obtained from the Colombo Zonal Education Office and selected type 1AB National school principals to conduct this study.

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The participants were briefed on their role in the research and the expectations prior commencement of the data collection. At the same times they were guaranteed of their conditionality and assurance of data provided by them will only be used for the purpose of this study. Further, the participants were informed that they have the freedom to quit from the study at any moment under any circumstance without any ill effects. Moreover, written consents were obtained from both parents and participants to make sure that their voluntary submission of information of their opinion is secured and unforced.

RESULTS

The results of this study offer complete insights into Sri Lankan Advanced Level (A/L) students' smartphone addiction levels and its impacts on education. This section provides a detailed analysis of study findings covering demographics, prevalence of smartphone addiction , impact of smartphone usage on education and statistical relationships between smartphone addiction and self reported overall academic achievements. In addition this section covers the effects of smartphone use on students' education.

A research sample of 506 Year 12 Advanced Level students participated in the study, with an average age of 17.8 years. The largest participant group consisted of students who were 18 years old at 77.27%, followed by those aged 17 at 21.73%, and the smallest group included 1.00% of 19-year-old students. The study included 263 male students (52%) and 243 female participants, who accounted for 48% of the total sample. The study thoroughly examined smartphone addiction and its impact on educational results by maintaining more or less male and female participant numbers. The highest enrollment rate among the sample students was in the Commerce subject stream, at 35.58%. In comparison, Arts students came second with 25.50%, followed by Physical Science students at 22.13% and Biological Science students at 11.66%. The Common stream comprised 2.76% of the students, while Technology enrollment stood at 2.37%. The participants' academic subject streams are widely distributed across different educational areas; thus, research findings represent diverse educational disciplines.

As shown in the table 1 given below, findings of the research indicated that smartphone addiction exists among 32.6% (n = 165) of Sri Lankan Advanced Level participants using the Short Version of the Smartphone Addiction Scale (SV-SAS). Among the total participants (n = 506), the SV-SAS evaluation classified 67.4% (n = 341) as not addicted to smartphones. Male students reported more cases of smartphone addiction, with 38.4%, compared to female students, who showed 26.33% addiction. The data demonstrates that smartphones create higher risks for addiction among male students as opposed to their female counterparts. Students had different assessments about smartphone addiction when they completed the SV-SAS assessment. A majority of 52.17% (n = 264) of students stated they were not addicted, but 36.96% (n = 187) expressed doubts about their addiction status. Only 10.87% (n = 55) claimed to be addicted. Students who fulfilled SV-SAS addiction criteria demonstrated actual addiction to smartphones, but only 24.85% out of 165 students admitted to being addicted, as evidenced by their answers to surveys. Most students (49 individuals, equivalent to 29.70%) stated they did not have an addiction, while 75 students (45.45%) were uncertain about their addiction status. The research data indicates that students demonstrate a poor understanding of their smartphone addiction, which reinforces the importance of educating them about proper smartphone usage.

Table 1 - Actual Smartphone Addiction vs. Self-Reported Addiction

Self- Reported Addiction	SV- SAS: Not addicted	SV- SAS: Addicted	Total
No, I am not addicted.	215	49	264
I am not sure.	112	75	187
Yes, I am addicted.	14	41	55
Total	341	165	506

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Average scores for each the SV-SAS item indicate which problematic smartphone behaviors of were common among Sri Lankan Advanced Level Students. As per the figures shown in table 2 shown below, it is revealed that students frequently faced two major smartphone use related challenges, 67.33% for missing planned work and 63.17% for difficulties on concentration in class. In contrast students demonstrated lower average scores for dependency symptoms, such as feeling impatient without holding their smartphone (34.33%) and constantly thinking about smartphones when not using them (30.17%).

Table 2 - Average Scores and Prevalence of Problematic Smartphone Use Behaviors Among Students

Item	Average	Percentage of Average
Missing planned work due to smartphone use.	4.04	67.33
Having difficulty concentrating in class, doing assignments, or working due to smartphone use.	3.79	63.17
Feeling pain in the wrists or at the back of the neck while using a smartphone.	2.58	43.0
I will not be able to stand not having a smartphone.	2.35	39.17
I feel impatient and fretful when I am not holding my smartphone.	2.06	34.33
Having my smartphone in my mind even when I am not using it.	1.81	30.17
I will never give up using my smartphone; even my daily life is already greatly affected by it	2.65	44.17
Constantly check my smartphone so as not to miss conversations between other people on Twitter or Facebook.	2.20	36.67
Using my smartphone longer than I had intended.	3.36	56.0
People around me tell me that I use my smartphone too much.	3.35	55.83

As shown in the table 3, students have displayed different levels of smartphone addiction according to their total scores obtained for the Short Version of the Smartphone Addiction Scale (SV-SAS). Among the 506 students, majority of students, 249 which means 49.21%, used their smartphones moderately without reaching addictive levels. Among the study participants, 144 students (28.46%) placed their scores at 31-40, thus demonstrating high risk of addiction addiction, and 38 students (7.51%) demonstrated severe addictive behaviour via scores exceeding 40. A small fraction of 1 student showed the most negligible smartphone dependency, scoring the lowest at 10 points on the survey.

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Results from this study indicate problematic smartphone use exists in a substantial portion of students while showing indicators of addiction possibility in near future among many participants.

Table 3 - Distribution of SV-SAS Scores Among Students

The total score obtained for SV-SAS	Number of students
10	1
11-20	74
21-30	249
31-40	144
41-50	35
> 50	3

The absence of standardized common examinations for Sri Lankan A/L students before their final G.C.E Advanced Level students made researchers to employ O/L exam results and current school term tests to measure self-reported overall academic achievement.

In the questionnaire students were asked to rate their current overall academic achievement status considering both their recent O/L scores and their term test results. Among the participants, most students (56.52%) ranked their results as moderate achievement, followed by 25.30% who had high results and 4.94% who achieved very high results. A fewer percentage of students acknowledged their academic performance as low (11.07%) and very low, (2.17%). In addition, students were asked to indicate their opinion on impact of smartphones on their education. Among the participants, majority (39.13%) reported that smartphones had no significant impact on their education. However, 32.41% reported that smartphones had a positive impact on education, whereas, 6.13% reported very positive impact. Conversely, 19.57% of the participants indicated a negative impact and 2.77% reported a very negative impact on their education. As per the figures shown in table 4 given below it is evident ,of the students who were not addicted (n = 341) were more likely to report experiencing either positive or very positive impact on education from using smartphones. Among the students who were not addicted to smartphones as per the total score of SV-SAS, 43.99% (150 students) , reported smartphones had a positive or very positive effect on their education. Among students identified as addicted only 45 out of 165 students (27.27%) had reported they believe the impact of smartphone use has positive or very positive impact on education. The addicted student group indicated higher rates of negative or very negative impact on education upon using of smartphones, (37.00%) than the non-addicted student group (15.26%).

Table 4 - Smartphone Addiction vs. Self-Reported Impact on Education

	Very Positive Impact	Positive Impact	No Significant Impact	Negative Impact	Very Negative Impact	Total
Not Addicted (SV-SAS -No)	26	124	139	46	6	341

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	Very Positive Impact	Positive Impact	No Significant Impact	Negative Impact	Very Negative Impact	Total
Addicted (SV-SAS-Yes)	5	40	59	53	8	165
Total	31	164	198	99	14	506

As mentioned previously, self reported academic achievement was based on results obtained by students at G.C.E. O/L examinations and school term tests. The data shown in table 5 clearly show that the students who have been classified as not addicted (n=341) , 27.56% (94 students) reported very high and high overall self reported academic achievement levels. However, among the students who are addicted to smartphone (n=165) only 18.48% (34students) reported very high and high overall self reported academic achievement levels. Additionally, 8.48% of addicted students (14 students) reported low or very low achievement, compared to 6.45% (22 students) among non addicted students.

Table 5 - Smartphone Addiction vs. Self-Reported Educational Achievement

	Very High Achievement	High Achievement	Moderate Achievement	Low Achievement	Very Low Achievement	Total
Not Addicted (SV-SAS- No)	94	29	196	18	4	341
Addicted (SV-SAS - Yes)	34	27	90	7	7	165
Total	128	56	286	25	11	506

A Chi-square test of independence was applied to evaluate the relationship between smartphone addiction measurements and self reported overall academic achievement level & perceived impact of smartphone use on education. Results showed that the Pearson Chi-square statistic reached 34.871 while maintaining a p-value of 0.000 (p < 0.05) for the relationship between smartphone addiction and self reported impact on education. Similarly, the Likelihood ratio Chi-square statistic was 34.506, also with a p-value of 0.000. These results indicate significant relationship between smartphone addiction and student perception of educational impact at a 0.05 significance threshold. The self reported overall education achievement ratings underwent another Chi-square analysis to determine its relationship with smartphone addiction. The Pearson Chi-square produced a value of 13.565, while its corresponding p-value reached 0.009 (p < 0.05). The likelihood ratio of the Chi-square statistic reached 12.892, and its p-value amounted to 0.012. These values suggests a statistically significant relationship exists between smartphone addiction levels and students' self reported overall education achievement.

To assess whether there is statistically significant relationship between self reported overall education achievement and self reported impact of smartphone use on education, another Chi-square test was performed. There is a strong statistically significant relationship between self reported overall academic achievement and self reported impact on smartphone usage on education as Pearson Chi square was 68.365, with a p-value 0.000 (p < 0.05). and likelihood ratio Chi-square statistic was 65.413, also with a p-value of 0.000.

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DISCUSSION

The observations resulting from this study impart noteworthy insights into the degree of smartphone addiction among Sri Lankan Advanced Level (A/L) students and its repercussions on their educational outcomes. The results indicate that smartphone addiction is prevalent among the sampled students (approximately 1 student of every 3 students is addicted to smartphones), with notable differences observed based on gender, duration of daily usage, and main purpose of use. Moreover, the study establishes a relationship between smartphone addiction and lower educational achievement, which is statistically significant, supporting concerns about the harmful and negative effects of excessive smartphone use on academic achievements.

One of the main observations is the higher occurrence of smartphone addiction among male students (38.4%) compared to their female peers (26.33%). This corresponds with previous research suggesting that males are more likely to engage in prolonged smartphone use, especially when it comes to activities such as gaming and social networking. This increased engagement among male students in non-educational activities may contribute to their higher proneness to addiction, potentially leading to adverse academic consequences.

The study also reveals that the main purpose for which smartphones are used influences addiction tendencies. Students who principally used smartphones for social communication and entertainment revealed higher addiction scores compared to those who used them for educational reasons. From this, it can be inferred that non-academic smartphone use, particularly for recreational activities, plays a major role in promoting addictive behaviors, which in turn may distract students' attention from academic responsibilities. Furthermore, the analysis suggests a significant inverse relationship between smartphone addiction and self-reported academic achievement. Students with higher addiction scores were inclined to have lower academic performance, strengthening the argument that excessive smartphone use interferes with study routines, reduces concentration, and ultimately impedes educational success. These findings emphasize the urgent need for structured guidelines to help students manage their smartphone use effectively.

All things considered, these findings contribute to the ongoing debate on smartphone addiction among adolescents, highlighting the immediate need for planned interventions. Educational institutions, policymakers, and parents must work together to enforce strategies that promote responsible smartphone use while reducing its adverse effects on academic performance, to a minimum. The development of a structured instructional model, combining screen time regulations and educational technology integration, could serve as a feasible solution in encouraging healthier digital habits among students.

Research teams worldwide have established that overusing smartphone results in poor academic outcomes. According to research from Samaha and Hawi (2016) in Lebanon and Lepp et al. (2014) in the United States, academic results show a negative correlation between extended non-curricular smartphone usage among students. The study by Perera et al. (2021) on Sri Lankan A/L students verified that extended smartphone usage decreased study effectiveness and exam results. These results compatible with the finding of this study, which proved a negative correlation with self reported overall academic achievements. . This aligns with broader research on the impact of digital distractions on academic success, reinforcing the argument that students need structured smartphone use guidelines to maintain an effective balance between educational and non-educational activities (Sooriyamudali & Jayawardana, 2021).

A notable trend observed in the data is the higher prevalence of addiction among male students compared to females, a pattern consistent with previous research suggesting that males are more prone to excessive smartphone use, particularly for entertainment and social networking activities (Munasinghe, 2016). This suggests that gender-based differences in smartphone engagement may play a role in the development of addiction, potentially influencing academic performance.

Educational institutions must develop specific guidelines for students to use their smartphones properly. Academic performance levels of students improve after participation in digital detox programs and the implementation of self-regulation strategies, according to Demirci et al. (2015).

The study results produce essential insights to consider in developing future educational policies and parental strategies for academic research. Schools, families, and policy leaders must collaborate to help students overcome smartphone addiction.

Schools should conduct sessions to enhance students' knowledge of safe and effective smartphone usage, ensuring responsible and informed digital habits. Academic institutions must teach digital literacy as part of their curriculum to help students regulate smartphone usage effectively. This will enable them to use smartphones for learning without letting devices become distracted. Schools should create absolute rules regarding smartphone use throughout school days to reduce disturbances during education.

Encouraging academic use of smartphones could help reduce addiction while benefiting their studies. Smartphone addiction negatively affects students by reducing concentration, disrupting study habits, and diverting them from academic pursuits, ultimately leading to poor results. To address this issue, structured interventions are necessary to help students balance academics and leisure activities.

Parents are responsible for managing screen time and helping children develop better digital behaviour. Students who create structured routines, combined with program control of smartphone usage and offline engagement, will decrease their likelihood of becoming addicted. Parents must monitor what their children do on the Internet and teach them about the academic and mental risks of excessive smartphone activities.

Although this research does not provide direct findings on the role of family and religion in reducing smartphone addiction, a strong family bond, social interactions, and religious influences could play a crucial role in minimizing excessive smartphone use. Additionally, psychological and social factors such as peer pressure and easy access to digital devices contribute to the formation of habitual smartphone use.

More research is needed to establish effective intervention strategies because this study demonstrates the effects of smartphone addiction on Sri Lankan A/L students. Research needs to investigate smartphone addiction intervention methods, such as creating mobile apps with time restrictions and developing behavioral programs focused on smartphone use mindfulness. Studies examining the success rate of school-based education initiatives and parenting control methods also provide valuable information about reducing smartphone addiction. Future research could benefit from longitudinal studies that track students' smartphone usage patterns and academic performance over an extended period. Such studies would provide deeper insights into the long-term effects of smartphone addiction, allowing researchers to determine whether excessive usage leads to a gradual decline in academic achievement or if students develop adaptive strategies to mitigate its impact over time.

Although this investigation provides meaningful insights into the research topic, several issues limit its findings. The research data consisted of self-reported information that might contain limitations due to social desirability bias and questionable accuracy in self-assessment. The study results potentially contain measurement errors because students might have provided inaccurate information regarding their mobile phone use and educational outcomes. Although the sample size is sufficient to represent the Sri Lankan Advanced Level student population, the study is limited to participants from the Colombo Education Zone, which may affect the generalization of the findings to other regions.

CONCLUSION

The results establish smartphone addiction as a substantial factor that degrades the academic achievements of Sri Lankan A/L students. The research demonstrates an urgent requirement to develop smartphone usage management strategies while implementing digital literacy training and creating educational technology guidelines for educational institutions alongside parents and policymakers. In conclusion, it is essential to educate students on the responsible use of smartphones within schools. Educational institutions and policymakers can implement structured programs to enhance academic performance by minimizing the negative effects of technology. Future research could explore strategies such as school smartphone policies, digital literacy education, and parental guidance programs to effectively address smartphone addiction among students

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REFERENCES

[1]. Alenezi, F. Y. (2017). Educational uses of smartphones by students at the Northern Border University in the Kingdom of Saudi Arabia. *International Journal of Educational Sciences, 36.* https://doi.org/10.1080/09751122.2017.1335055

[2]. Arumugam, N., Selvanayagam, S., & Sathiyasenan, S. T. (2020). The effects of smartphone usage on university students. *International Journal of Academic Research in Progressive Education and Development.* https://doi.org/10.6007/ijarped/v9-i3/7960

[3]. Bianchi, A., & Phillips, J. G. (2005). Psychological predictors of problem mobile phone use. *CyberPsychology & Behavior*, 8(1), 39–51. https://doi.org/10.1089/cpb.2005.8.39

[4]. Chathuranga, S., & Jayasundara, J. M. P. K. (2020). The impact of smartphone addiction among adolescents in selected schools in the Piliyandala Educational Zone in Sri Lanka. *Proceedings of the International Open University Research Sessions (iOURS 2020).*

[5]. Chen, I., et al. (2020). Psychometric properties of three simplified Chinese online-related addictive behavior instruments among mainland Chinese primary school students. *Frontiers in Psychiatry.* https://doi.org/10.3389/fpsyt.2020.00875

[6]. Demirci, K., Akgönül, M., & Akpınar, A. (2015). Relationship of smartphone use severity with sleep quality, depression, and anxiety in university students. *Journal of Behavioral Addictions*, 4(2), 85–92. https://doi.org/10.1556/2006.4.2015.010

[7]. Gunawardana, L. K. A. C., & Senevirathne, S. R. S. (2016). Factors influencing the smartphone addiction among students of the North Central Province in Sri Lanka. *Proceedings of the 5th International Conference on Management and Economics.*

[8]. Hawi, N. S., & Samaha, M. (2016). To excel or not to excel: Strong evidence on the adverse effect of smartphone addiction on academic performance. *Computers & Education,* 98, 81–89. https://doi.org/10.1016/j.compedu.2016.03.007

[9]. Junco, R., & Cotten, S. R. (2012). No A 4 U: The relationship between multitasking and academic performance. *Computers & Education*, 59(2), 505–514. https://doi.org/10.1016/j.compedu.2011.12.023

[10]. Kwon, M., Kim, D. J., Cho, H., & Yang, S. (2013). The smartphone addiction scale: Development and validation of a short version for adolescents. *PLoS ONE*, 8(12), e83558. https://doi.org/10.1371/journal.pone.0056936

[11]. Kwon, M. J., et al. (2013). Development and validation of a smartphone addiction scale (SAS). *PLoS ONE.* https://doi.org/10.1371/journal.pone.0056936

[12]. Lepp, A., Barkley, J. E., & Karpinski, A. C. (2015). The relationship between cell phone use and academic performance in a sample of U.S. college students. *SAGE Open* https://doi.org/10.1177/2158244015573169

[13]. Limniou, M. (2021). The effect of digital device usage on student academic performance: A case study. *Education Sciences*, 11(3), 121. https://doi.org/10.3390/educsci11030121

[14]. Mohammad, H., Fayyoumi, A., & AlShathry, O. (2015). Do we have to prohibit the use of mobile phones in classrooms? *International Journal of Interactive Mobile Technologies (iJIM),* 9(2), 54–59. https://doi.org/10.3991/ijim.v9i2.4394

[15]. Munasinghe, P. G. (2016). Factors Influencing the Smartphone Addiction Among Students of the North Central Province in Sri Lanka. *Proceedings of Annual Bangkok Business and Social Sciences Research Conference.* https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2794735

[16]. Panadero, E. (2017). A review of self-regulated learning: Six models and four directions for research. *Frontiers in Psychology*, 8, 422. https://doi.org/10.3389/fpsyg.2017.00422

[17]. Perera, D. R. (2021). Does techno stress impact on university students' academic performance in the new normal? *International Journal of Engineering and Management Research.* https://doi.org/10.31033/ijemr.11.6.12

[18]. Praveeni, S. M. N., & Wickramasinghe, C. N. (2020). Impact of smartphone addiction on academic performance of undergraduates in Sri Lanka; mediating effect of technology-driven multitasking. *Kelaniya Journal of Management,* 10.

[19]. Rozgonjuk, D., & Elhai, J. D. (2019). Emotion regulation in relation to smartphone use: Process smartphone use mediates the association between expressive suppression and problematic smartphone use. *Current Psychology*, 38(5), 3246–3258. https://doi.org/10.1007/s12144-019-00271-4

[20]. Rozgonjuk, D., Kattago, M., & Täht, K. (2018). Social media use in lectures mediates the relationship between procrastination and problematic smartphone use. *Computers in Human Behavior*, 91, 191–198. https://doi.org/10.1016/j.chb.2018.08.003

[21]. Samaha, M., & Hawi, N. S. (2016). Relationships among smartphone addiction, stress, academic performance, and satisfaction with life. *Computers in Human Behavior,* 57, 321-325. https://www.sciencedirect.com/science/article/pii/S0360131516300804.

[22]. Strøm, A. (2021). The negative effects of technology for students and educators. *Northwestern College Digital Commons.* https://nwcommons.nwciowa.edu/cgi/viewcontent.cgi?article=1322&context=education masters.

[23]. Sooriyamudali, P., & Jayawardana, J. (2021). Impact of Smartphone Addiction on Academic Performance of Undergraduates in Sri Lanka: Mediating Effect of Technology-Driven Multitasking. Kelaniya Journal of Management, 10(0), 1-22. https://kjm.sljol.info/articles/10.4038/kjm.v10i0.7681

[24]. Wickramasurendra, J. M., Jagoda, D. J., & Rathnayake, R. M. L. (2021). Factors Influencing Social Media Addiction among G.C.E. Advanced Level Students in Sri Lanka: A Case Study in Colombo District, Sri Lanka. Sri Lanka Journal of Social Sciences and Humanities, 1(2), 1-11. Retrieved from https://www.sab.ac.lk/sljssh/articles/issue-1-2/sljssh-1(2)-1.

[25]. Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. *Handbook of self-regulation*, 13(1), 13-39.