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The Price of Screen Time: How Prolonged Digital Exposure is Contributing to Rising Stress and Anxiety Among University Students

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Abstract

The research looks into the effects of screen time on the mental health of students enrolled in universities, by assessing their stress, anxiety, depression symptoms, and sleep quality. There has been an increase in screen time and, thus, researchers associate it with poor mental health conditions, mostly due to remote learning introduced because of the COVID-19 pandemic. Screen-based activities cause poor sleep patterns, decreased physical activities and unhealthy interpersonal interactions that compound to elevate the effects of stress and depression. Student behaviours, such as watching full shows within a short time, are likely to aggravate procrastination and emotional withdrawal as well as social separation that reduce mental wellness. The evidence shows that high screen use has adverse effects on the psychological health of people, especially when they exceed the advised levels. The study shows that the problem with sleep is an intermediary leading to mental health issues as a result of too much screen time. The research proves that good mental outcomes require good screen time management and outdoor fun. Nevertheless, the universities need to implement initiatives so that limitations on the exposure of screen time, as well as encouragement of physical activity and well-being, are provided. Such initiatives show the possibility of improving the wellness conditions of students.

***Keywords*:** binge watching, screen time, social media usage, stress, university students

Introduction

The constant use of technology and devices by university students has raised key issues concerning their impact on the psychological health of students. Screen time, which has risen since the COVID-19 outbreak and online

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learning introduction, is positively correlated with stress, anxiety, and depressive symptoms (Deyo et al., 2024; Rosenthal et al., 2021; Wu et al., 2015). Research has pointed out that not only do these constructs worsen these mental health problems, but they also negatively affect sleep and physical activity levels (Ge et al., 2020; Lavados-Romo et al., 2021). Services like Netflix take this concept to another level, where young adults practice binge-watching daily (Pittman & Sheehan, 2015; Starosta & Izydorczyk, 2020). Although it clears boredom, stress, and academic pressure for a certain period, it also leads to adverse effects like procrastination, solitude, and emotional disengagement (Karuza, 2020; Lemenager et al., 2020).

Studies have also pointed out the concept of green time, which refers to the recreation time spent in natural surroundings as a buffering factor that reduces the negative impacts of high levels of screen time. Deyo et al. (2024) suggested that students who had high physical activity levels outside class had lower stress and depression levels, while anxiety was only mildly reduced. Similarly, other research indicates that time-in-nature rehabilitation helps elevate mood and decrease stress (Kondo et al., 2018; Liu et al., 2018). However, the relationship between screen time and green time is still confusing. For instance, students who used screens for extended durations and hardly spent time outdoors expressed similar mental health symptoms. In contrast, those who equally split screen time and outdoor time had improvements in stress and depressive symptoms (Deyo et al., 2024).

However, some issues are still evident even with reducing the negative impact of screen time, mainly because of the addictive nature of screens (Brand et al., 2019; Rubenking et al., 2018). Most readily available platforms, such as Netflix, create inconveniences of binge-watching, which interferes with proper sleep, school, and interpersonal connections (Vaterlaus et al., 2019; Yasir et al., 2023). These problems call for the need to adopt specific preventive measures to compel students toward restorative activities such as exposure to the natural environment. Consequently, universities can improve students' psychological well-being by encouraging more green time than screen time (Deyo et al., 2024; Garbóczy et al., 2021).

Literature Review

The concept of screen time, or the amount of time a person is exposed to digital technologies through devices, including smartphones, tablets,

computers, and televisions, either in an academic, social, or recreational context, has become a staple of the everyday lifestyle of university students, especially, after online learning became a preferred method of educating during the COVID-19 pandemic (Baiden et al., 2019; Rosenthal et al., 2021). Screens play a significant role in the coursework, social networking, and entertainment of this population, where their use may surpass the recommended hours, which results in certain consequences on mental health (Wu et al., 2015). The definition of psychological well-being involves presenting the construct as multidimensional with the components of emotional, social, and cognitive health, high self-esteem, strong emotional controls, and the existence of a sense of purpose (Li et al., 2019; Woods & Scott, 2016). In contrast, lower psychological well-being can be documented as an outcome in the form of anxiety, depression, or social isolation, which are all aggravated by too much screen exposure (Rosenthal et al., 2021). The relationship between screen time and psychological health is multifaceted, where sleep impairment, decreased in-person communication, and binge eating behaviors are considered to be maladaptive, affecting psychological health, which requires an in-depth study so that the information can help plan interventions in university students (Hassan et al., 2024; Wu et al., 2015).

Greater use of digital devices, especially during the COVID-19 pandemic, has created more concerns over the effects of screens on mental health (Baiden et al., 2019). Research and studies have found that there is a positive relationship between excessive screen time and stress symptoms, anxiety, and depression, specifically in young adults who are learning to balance life in the academic world (Çayci, 2021; Rosenthal et al., 2021). These consequences are multiplied by the fact that screen-based activities are sedentary, thus limiting the chances of conducting physical and social activities, worsening the psychological well-being further (Lavados-Romo et al., 2021). To establish a balance between digital engagement and mental health, it is essential to understand these dynamics, particularly in culturally specific settings, such as Pakistan, where there are scarce studies on the topic (Hassan et al., 2024).

Theoretical Framework

The theoretical framework will be based on two complementary theories, namely, the Uses and Gratifications Theory (U&G) and the Interaction of Person-Affect-Cognition-Execution (I-PACE) model,

through which one can interpret the effect of screen time on the psychological well-being of individuals. Through the U&G theory, one may assume that a person chooses media with a purpose in regard to a particular psychological need (Sohail et al., 2019) be it relaxation, entertainment, or socializing (Katz & Blumler, 1974). In the case of university students, screen time can be a means of managing the level of academic pressure, boredom, or the feeling of being alone, as platforms such as Netflix and other social media applications are quick ways of achieving pleasure (Pittman & Sheehan, 2015). Nevertheless, such a relief may be temporary and can be followed by adverse effects such as procrastination, emotional withdrawal, or compulsive use of media (Vaterlaus et al., 2019). The U&G theory is used as a lens through which screen time is viewed as an intentional activity, thus informing the study regarding the reasons for students to indulge themselves in excess screen time and the consequent outcomes.

I-PACE model expands the U&G theory by clarifying the processes by which excessive screen time turns maladaptive (Brand et al., 2019). It supports the idea that extensive contact with digital media weakens the regulation of behavior that manifests in negative emotions, a lower decision-making ability, and other behavioral problems, i.e., binge eating or compulsive screen use (Brand et al., 2019). The model underscores the interaction of affective and cognitive mechanisms, in which too much screen time elicits a loop of low self-control, high levels of stress, and improper coping mechanisms, which is especially important in university students since they are under pressure academically and socially (Lemenager et al., 2020). Combining U&G and I-PACE, this paper studies not only the reasons behind screen usage but also its harmful consequences, which facilitates a detailed model of interpreting empirical data and developing interventions that mitigate the causes of psychological problems expressed through screen usage.

Sleep Disruption Due to Extended Screen Use

Extended use of screens, especially late into the evening, causes sleep disruption, sleep disorders and reduced sleep because they inhibit the synthesis of melatonin, which can be blocked by blue light rays emitted by digital devices (Lemenager et al., 2020; Li et al., 2019). Students at universities are especially prone to this disturbance of circadian rhythms, as they regularly use screens late at night to study or consume entertainment,

which results in tiredness, irritability, and poor cognitive functioning (Delong et al., 2014; Wu et al., 2015). According to Wu et al. (2015), high levels of screen use amongst Chinese college students were linked to poor sleep quality, which mediated the connection between screen use and enhanced symptoms of anxiety and depression. Likewise, Lemenager et al. (2020) have found that the sleep disturbances of young adults in Germany have worsened due to the lockdown-induced increment in screen time during the COVID-19 pandemic. Deyo et al. (2024) also highlight the importance of sleep as a mediator between screen time and mental and social well-being since poor sleep aggravates the adverse outcomes of screen use on the mental and social status, forming the vicious circle of students trying to bind stress with the use of screens but experiencing their sleep worsening even more. Such results indicate the necessity of strategies targeting the reduction of psychological effects of pre-bedtime screen use.

Social Interaction and Isolation from Prolonged Screen Exposure

Prolonged exposure to screens causes social interaction and isolation, and deprives people of effective in-person communication, making university students subject to social isolation and loneliness (Pittman & Reich, 2016; Hassan et al., 2024). Online communication using digital platforms often leads to para-social interactions with celebrities or fictional characters that are not emotionally sophisticated enough in comparison with real-life relationships (Kottasz et al., 2019). Using social media thus has been found to correlate with loneliness occurring as students trade their face-to-face interaction with their virtual presence and the issue has been exacerbated by the social limitations of the COVID-19 pandemic (Baiden et al., 2019). These effects are further increased by the use of social comparison, especially on platforms like Instagram, where unrealistic expectations on life and relationships are propounded, which reduces self-esteem and increases dissatisfaction in social relations (Hassan et al., 2024). Kottasz et al. (2019) argue that, despite the initial satisfaction, para-social relationships isolate students after media disengagement. Hence the state of the digital connectedness paradox in which, during the process of communication through the screen, the quality of social relationships, that form the psychological well-being, is undermined.

Mental Health and Emotional Regulation Affected by Screens

Screens also affect mental health and emotional regulation. Comprehensive empirical investigation suggests a strong association between screen time and increased stress, anxiety, and depressive symptomatology among university learners, which is mostly mediated by academic stressors and exposure to carefully selected online content (Çayci, 2021; Woods & Scott, 2016). Post-binge depression is an impoverished state caused by the ubiquitous screen-based activity of binge-watching, termed by the students as a feeling of loneliness and emotional disengagement amid excessive media consumption (Rubenking et al., 2018; Sun & Chang, 2021). In particular, Rubenking et al. (2018) indicated that binge-watching causes increased emotional reactivity when actively involved, and depressive symptoms when people stop binge-watching, as learners fail to resituate themselves into the outer reality. The I-PACE model is a relevant theory in these findings because it suggests that overuse of screens suppresses the stress coping abilities, which increases irritability and suppresses emotional resilience (Brand et al., 2019). Woods and Scott (2016) also noted that due to a combination of social media use in the adolescent phase and continuing it through the university years, its use correlates with declining sleep quality, onset of anxiety, and loss of self-esteem, all of which further exacerbate the mental-health issues of this group.

Unhelpful Behavior Patterns and Binge Eating Linked to Screen Time

Exposure to screens is also becoming a more accepted factor behind the development of unhelpful behaviour patterns, especially binge eating, which emerges as a stress-reduction technique when people are in extended sedentary positions (Rubenking et al., 2018; Karuza, 2020). The empirical evidence has shown that students studying in universities, spending prolonged hours on the screens would willingly find themselves indulging in junk food in an unconscious way, leading to a complete lack of control over portions, gaining weight, leading to the consequent guilt and dissatisfaction (Hassan et al., 2024). Karuza (2020) explains that screen time-related binge eating is an emotional escape mechanism of stressed, lonely, or bored people, which only continues this cycle with an additional mental health impairment. These findings are supported by Rubenking et al. (2018), who prove that screen activities interfere with mindful eating and contribute to the development of poor dietary behaviors. Brand et al. (2019)

use the I-PACE model to fit such behaviors, and outline them as the results of low self-regulation at the point where heavy use of the screen up-regulates emotional responses and leads to impulsive actions in reaction to the problem of distress. All these findings collectively highlight the complex outcomes of screen time on physical and mental health that are moderated by the influence of emotions and the environment.

Green Time as a Balancing Effect Against Screen Overuse

Interaction with natural environments, traditionally called green time, serves as a balancing factor against the negative effects of overindulging in screen-based activities by reducing stress levels, enhancing mood and promoting psychological recovery (Kondo et al., 2018; Oswald et al., 2021). According to Deyo et al. (2024), undergraduate respondents who harbor a regular engagement in outdoor activities in general have reduced depressive and anxiety symptomatology despite the excessive exposure to screens, thus demonstrating that green time neutralizes the negative effects of digital overuse. Liu et al. (2018) show that green environment access on the campus facilitates relaxation and builds social cohesion, thereby compensating for social isolation during prolonged screen use. A review synthesis of empirical data conducted by Kondo et al. (2018) demonstrated that outdoor environments significantly inhibit cortisol secretion, which is a key physiological indicator of stress, therefore, corroborating neurological evidence with the restorative effect of green time. According to Oswald et al. (2021), during the COVID-19 pandemic, the escalated use of screens did not entail severe psychological outcomes due to the specifics of natural exposure, especially in the scope of lockdowns. Ge et al. (2020) also affirm that by combining physical exertion and naturalistic exposure these protective effects can be strengthened, and may reduce the perceived stress for undergraduate students. Collectively, these results reveal that green time is a restorative counterbalance to excessive use of digital devices, providing universities with a practically applicable plan to improve student health by increasing green spaces on campus, organizing outdoor programs, and implementing policies that support nature-focused activity (Hassan et al., 2024).

Preventive Role of Daily Green Time Integration

Green time, integrated daily, can help mitigate sedentary and isolating screens preventatively through a more comprehensive approach to mental

health protection (Deyo et al., 2024). Liu et al. (2018) reported that students accessing green spaces on campus more often reported enhanced mood and less stress despite the need to balance the highly demanding academic activities and screen time. Similarly, Ge et al. (2020) highlight that outdoor physical exercise not only reduces stress levels but also improves social relationships, which is also a problem associated with spending too much time in front of screens (Pittman & Reich, 2016). The findings are consistent with the U&G theory because the students might use green time to satisfy their needs of relaxation and social intercourse, providing a healthier version of screen-based activities (Katz & Blumler, 1974). The universities can use such information to develop green spaces, location-based outdoor activities in a healthy individual program, and cope with the psychological issues of digital overusage (Hassan et al., 2024).

Research Gap

Although the available literature on screen time and its effect on psychological health is abundant, it still has substantial gaps, especially in non-Western states (Hassan et al., 2024; Yasir et al., 2023). The majority of the available literature addresses Western or developed countries, which narrows the gap for the present study to a culturally diverse population who might have a somewhat different set of social and academic pressures (Asgher & Gohar, 2022). Quantitative-based existing studies on the topic are prevalent in Pakistan, and a few qualitative observations have been made on how students experience this screen time and the resulting psychological outcomes (Hassan et al., 2024). Besides, the mediation of factors that can foster mental health outcomes like sleep disruption, social interactions, and effects in the form of binge eating has never been systematically examined in a Pakistani university setting even though they are known to influence outcomes (Deyo et al., 2024; Wu et al., 2015). There is also a lack of research in the protective role of green time in the Pakistani context, and it is not clear that exposure to natural environments would help address Pakistani students' screen-related problems (Hassan et al., 2024).

This research paper aims to fill these gaps and explore the impact of screen time on the psychological well-being of Pakistani university students through the lenses of U&G and I-PACE concepts. The U&G theory contributes to the explanation of students' reasons to visit a screen, i.e., the need for relaxation or the feeling of social connection, and the I-PACE model explains the processes by which the overuse results in negative

consequences, i.e., emotional dysregulation and maladaptive behavior (Brand et al., 2019; Katz & Blumler, 1974). This study uses cultural specificity to design an intervention that corelates the harmful consequences of screen overuse with mental health, and has the potential to be applied throughout academia by providing practical solutions in academic institutions in Pakistan and other places (Hassan et al., 2024). The value of green time as a protective factor also contributes to the relevance of the study, paving the way to challenge the negative consequences of overusing digital devices within a resource-poor environment (Deyo et al., 2024; Kondo et al., 2018).

Methodology

This paper employs a quantitative research approach to address the proposed research question and hypotheses concerning the impact of screen time on the psychological functioning of university students based on their social relationships, mental health status, eating behaviours, and sleep length. An online structured questionnaire was used to collect objective, quantitative data from the respondents. Since this survey was cross-sectional, the researchers could simultaneously assess the correlation between screen time and these psychological well-being variables. This can prove very beneficial in identifying patterns of screen-based behaviours and their associated effects (Wu et al., 2015). Using purposive sampling, the targeted participants were recruited based on the inclusion criteria of being a university student currently, being aged above 18 years, and owning/ having regular access to a digital device. A total of 300 participants were chosen concerning the recommendations of similar studies that indicate that a sample size of 150-250 participants is optimal for detecting medium and significant effects in psychological and behavioural research (Deyo et al., 2024; Rosenthal et al., 2021).

The study sample was composed of 300 university students who were used to explore the correlations between screen time, sleep, and the outcomes on mental health. Statistical power calculations were used to estimate the sample size, so that the results could have sufficient power to deliver medium to large effect sizes, as is standard in psychological research. For instance, to have a correlational study with 80 percent power to detect a medium effect size ($d = 0.5$) with an alpha level determines at 0.05. Cohen (2016) a minimum sample of 200-300 participants is recommended. On the same note, Memon et al. (2020) observe that a sample

size of 160-300 is optimally balanced between practical limits and statistical power in social sciences when conducting a multivariate analysis. In a similar study conducted by Smith et al. (2020), a sample of 250 subjects was used, and they found moderate correlations (r = 0.3) with sufficient power. The decision on 300 participants rests on the basis of enough statistical power to find meaningful associations but at the same time, being practical to collect data. The sample used however, including university students, restricts the ability to generalize further to other groups such as non-students of adult age or other populations with different cultural or socio-economic backgrounds. College students, who are individuals in the transition age between adolescence and adulthood, might have unique patterns of their screen usage and their sleep schedule.

According to Lee et al. (2023), of influence of screen time on mental health depends on the cultural and socio-economic contexts within which the phenomenon can manifest differences between the urban and rural population associated with access to technology and cultural attitudes. Therefore, the results obtained cannot be viewed as entirely universal among students with non-Western background and limited accessibility to devices. Future studies need to consider a variety of samples (e.g., working population or a population with diverse cultural backgrounds) to determine the generalizability of these results. The cross-sectional nature of this work eliminates the possibility of defining causality between screen time, sleep, and mental health. Even though this limitation has been addressed, longitudinal research would shed more light on cause-and-effect. An example is the study by Chen et al. (2024), who followed a sample of adolescents over two years in a longitudinal study to show that longer screen time was a cause of subsequent reductions in sleep quality. Future studies would do well to use longitudinal designs where repeated measures will be used to create changes in time and experimentally used measures like reducing exposure to screens at night to test out causal mechanisms. Objective measures, such as actigraphy to measure sleep or an app to monitor screen time, as recommended by Chen et al. (2024), would increase the accuracy of measurements and extend the existing research to find more answers to these connections.

Previous research questionnaires and scales develop the questionnaire adopted in this study. Time spent on screen, self-reported mood, social contacts, binge eating habits, and self-reported hours of sleep for that day

were all captured from previous well-documented works of Hassan et al. (2024) and Rubenking et al. (2018). These studies gave insight into reliable and contextually appropriate questions that could be developed for young adults. For instance, the questions of mental health, such as "Screen time makes me stressed or anxious," and sleep, such as 'Screen time affects the quality of my night sleep", is based on research on the effects of screen time on emotional regulation and sleep (Lemenager et al., 2020; Li et al., 2019). This way, the reliability and validity of the measures will be ensured because the questions have already been applied in other paradigms.

The questionnaire was developed in seven sections. The first section collected demographic information such as age, gender, and education levels to understand the results. The second part of the questionnaire was dedicated to the average daily screen time, which included < 2 hours, 2-4 hours, 4-6 hours, more than 6 hours, and more than 7 hours. The succeeding sections evaluated the primary psychological and behavioural patterns. Specifically, the social interaction's part focused on online and face-to-face communication preferences, the effects of screen detachment from people in relationships, and those who were single. The mental health section examined the impact of three distinct media types which include print media (e.g., newspapers, books, and magazines), electronic media (e.g., television and radio), and screen time (e.g., smartphones, tablets, and computers) on stress, anxiety, mood, and self-rated mental health. The eating behaviours in the screen use segment reviewed snacking, portion control, and meal selection during binge episodes. Finally, the sleep duration section involved pre-sleep screen use, sleep quality, and the effect of sleep quality on mental health. A 5-point Likert scale was used in each section with response options to include *Strongly Disagree, Disagree, Neutral, Agree,* and *Strongly Agree*, which provided significant information on the participants' perceptions and their behavior.

The independent variable was screen time, which was evaluated by the participants' usual frequency of screen time per day. The dependent variables were social interaction, psychological health, binge eating, and hours of sleep. Sleep duration was also a mediating variable, as previous studies suggest it is a mechanism connecting screen time to the psychological and behavioural consequences (Deyo et al., 2024). Data were analyzed using a statistical software series, SPSS (Statistical Package for the Social Sciences). Participant demographics and responses were

described using descriptive statistics while attempting to explain the relationships between screen time and dependent variables through correlation and regression analysis. The mediating effects of sleep duration were tested based on Baron and Kenny (1986) to identify whether sleep disruption would account for the association of screen time with psychological outcomes.

Great care was taken to showcase the ethical parameters met during research. Before starting the survey, participants signed an informed consent form and were informed of the study's purpose, confidentiality, and anonymity. The respondents were always told that their participation was voluntary and that they had a right to withdraw at any time. All data were secured, and only the research team could access them, so the ethical formulation was followed.

Analysis and Discussion

This section discusses the results of the study on how screen time influences the psychological health of university students through social interaction, mental health, eating habits, and sleep, and compares them with the existing literature.

Table 1

Demographics

	N	*%*
Age		
18-22	166	43.3%
23-27	150	39.2%
28-32	55	14.4%
Above 32	12	3.1%
Gender		
Female	200	52.2%
Male	183	47.8%
Education level		
Graduate	101	26.4%
Postgraduate	26	6.8%
Undergraduate	256	66.8%

From the demographic breakdown of the participants in Table 1, 43.3% of the participants are within 18-22 years of age, with 39.2% between 23-

27 years of age, 14.4% from the age bracket of 28-32 years, and only 3.1% of the participants are above 32 years of age. Distribution by gender is also slightly biased towards females (52.2%) compared to males (47.8%). As per the educational levels of the participants, most of the students are undergraduate (67.2%), while 26.4% are at the graduate level, and 6.2% are postgraduate level students. These proportions correspond well with our target population of university students, which allows us to obtain a representative sample for the analysis of the impact of screen time on their psychological states.

Table 2

Reliability Analysis

Social Interaction		Mental Health		Binge Watching		Sleep Duration	
α	*k*	α	*k*	α	*k*	α	*k*
0.772	5	0.701	5	0.718	5	0.775	5

The coefficient alpha reliability coefficient analysis also reveals a uniformly moderate internal consistency estimate for each of the measures employed in this research. The reliability assessment of the Social Interaction scale gave a Cronbach's Alpha of 0.772 with five items. Likewise, the Mental Health scale yielded a Cronbach's Alpha of 0.701 with five items. Hence, it was deemed reliable. The Cronbach's Alpha of the Binge-Watching scale was 0.718, using five reliability items in this study. Finally, as a measure of internal consistency, the Sleep Duration scale correlates at a Cronbach's Alpha of 0.775 for five items and is, therefore, highly reliable. These results support the scale's reliability for progressing to further statistical analysis.

Table 3

Regression Analysis

Between-Subjects Factors		
Average daily screen-time usage	Value Label	*N*
1	2-4 hours	71
2	5-7 hours	272
3	Less than 2 hours	7
4	More than 7 hours	33

Multivariate Tests

Effect		Value	*F*	Hypothesis *df*	Error *df*	Sig.
Intercept	Pillai's Trace	0.817	561.366b	3.000	377.000	0.000
	Wilks' Lambda	0.183	561.366b	3.000	377.000	0.000
	Hotelling's Trace	4.467	561.366b	3.000	377.000	0.000
	Roy's Largest Root	4.467	561.366b	3.000	377.000	0.000
ST	Pillai's Trace	0.369	17.712	9.000	1137.000	0.000
	Wilks' Lambda	0.634	21.000	9.000	917.670	0.000
	Hotelling's Trace	0.573	23.915	9.000	1127.000	0.000
	Roy's Largest Root	0.565	71.386c	3.000	379.000	0.000

a. Design: Intercept + ST b. Exact statistic c. The statistic is an upper bound on F that yields a lower bound on the significance level

Tests of Between-Subjects Effects

Source		Type III Sum of Squares	*df*	Mean Square	*F*	Sig.
Corrected Model	Sc_Int	37.195a	3	12.398	57.184	0.000
	Mt_Hlth	26.769b	3	8.923	35.827	0.000
	Bng_Eat	30.858c	3	10.286	39.293	0.000
Intercept	Sc_Int	272.300	1	272.300	1255.912	0.000
	Mt_Hlth	226.199	1	226.199	908.240	0.000
	Bng_Eat	260.803	1	260.803	996.288	0.000
ST	Sc_Int	37.195	3	12.398	57.184	0.000
	Mt_Hlth	26.769	3	8.923	35.827	0.000
	Bng_Eat	30.858	3	10.286	39.293	0.000
Error	Sc_Int	82.173	379	0.217		
	Mt_Hlth	94.390	379	0.249		
	Bng_Eat	99.213	379	0.262		
Total	Sc_Int	945.200	383			
	Mt_Hlth	870.160	383			
	Bng_Eat	940.120	383			
Corrected Total	Sc_Int	119.368	382			
	Mt_Hlth	121.159	382			
	Bng_Eat	130.070	382			

a. *R* Squared = .312 (Adjusted *R* Squared = .306)
b. *R* Squared = .221 (Adjusted *R* Squared = .215)
c. *R* Squared = .237 (Adjusted *R* Squared = .231)

The multivariate regression analysis shows that daily screen time usage statistically significantly affects social interaction, mental health, and binge eating among university students. The findings reveal that screen time has a statistically significant effect on these dependent variables as evidenced by the values listed below; multivariate tests including Pillai's Trace, Wilks' lambda, Hotelling's Trace, and Roy's Largest Root all yielded $p < 0.001$. These results confirm previous studies on the negative consequences of increased screen time on psychological and behavioural outcomes.

Regarding social interaction, the findings reflected screen time with $F = 57.184$ and $p < 0.001$. This implies that more screen time undermines traditional face-to-face interaction and, in turn, promotes social exclusion. These observations are similar to the conclusions made by Pittman and Reich (2016), who state that spending time in front of screens causes a decrease in face-to-face interaction with other people. Kottasz et al. (2019) also highlighted that para-social relationships are established with media personalities, characters, or 'virtual' friends and family; screen time replaces actual interpersonal connections, leading to further social isolation. This prevalent trend was particularly noticeable in the recent pandemic, where restrictions on physical interactions limited people primarily to screens, worsening feelings of isolation.

The study also revealed the existing connection between the amount of time spent using screens and mental health, $F = 35.827$ and $p < 0.001$. It was also found that habitual use of screens was incredibly disruptive, increasing stress, anxiety, and depressive symptoms when screens were used for more than two hours at a time. This is in support of the assertions of Wu et al. (2015), who observed that long hours of screen time are detrimental to the symptoms of depression and the overall chance of developing emotional issues. Furthermore, Woods and Scott (2016), in their article, which was published in the year 2016, revealed that excessive use of social media leads to increased levels of anxiety and reduced self-esteem, especially among college students. The theoretical model outlined by Brand et al. (2019) used in the present study is known as the Interaction of Person-Affect-Cognition-Execution (I-PACE) model and assumes that negative emotions are influenced by reduced stress regulation and cognitive overload due to the use of screens.

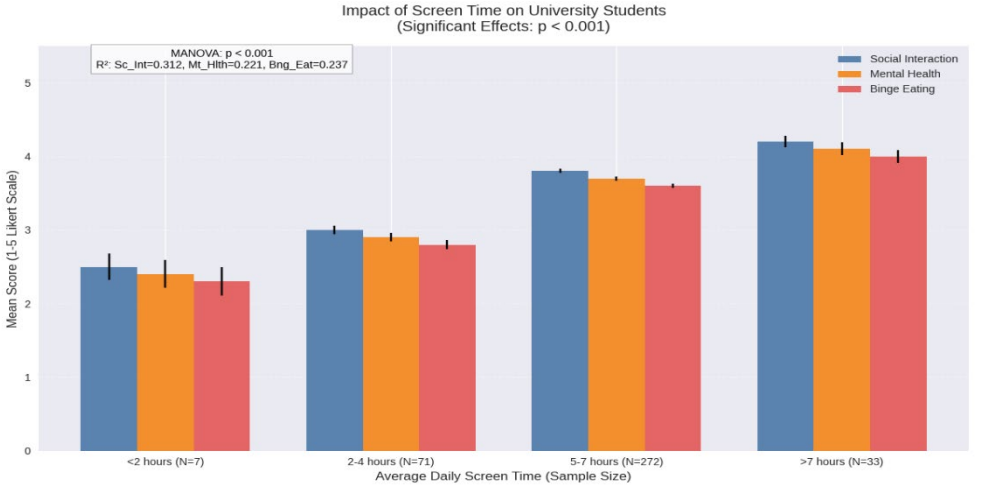
Screen time was also positively linked with binge eating with $F = 39.293$ and $p < 0.001$. The results indicate that excessive screen time leads

to pathogenic eating patterns, including binge eating, increased intake of snacks as well as poor ability to manage portions. Other research conducted by Rubenking et al. (2018) identified that people who watch TV more often or spend lots of time on computers or other screens eat more unhealthy products and overeat; they report eating for stress relief. In the same regard, Karuza (2020) pointed out that screen-based activities are overwhelmingly associated with the sedentary consumption of foods and the distraction those screens offer during meals. Such behaviours not only lead to unhealthy physical symptoms but also induce feelings of guilt and dissatisfaction, negatively affecting one's psychological health.

The conclusion drawn from this synthesis confirms previous research and theoretical perspectives, including the Uses and Gratification Theory, which expounds that media consumption is the means through which people satisfy their psychological needs. However, it has adverse effects such as withdrawal, social isolation, poor mental health, and poor eating habits. Therefore, these findings complement prior research and support the notion that screen time affects university students in various ways, stressing the necessity for interventions to improve students' media practices and enhance the balance between screen time and offline interaction. These interventions could help address the screen time problem since prolonged screen usage has multiple psychological and behavioural effects on learners in academic and social contexts.

Figure 1

Impact of Screen Time on University Students:



Higher daily screen use (from <2 to >7 hours) is linked to increased negative effects on Social Interaction, Mental Health, and Binge Eating, with significant differences (MANOVA: $p < 0.001$; R^2: Sc_Int=0.312, Mt_Hlth=0.221, Bng_Eat=0.237).

Table 4

Mediation Analysis

Section	Details	Key Mediation Metrics	Details		
Model Overview					
Independent Variable (X)	Screen Time (ST)	Effects of ST on Slp_Dur (Mediator)			
Mediator (M)	Sleep Duration (Slp_Dur)				
Dependent Variables (Y)	Social Interaction (Sc_Int), Mental Health (Mt_Hlth), Binge Eating (Bng_Eat)	Model Summary	R^2=0.0597, p<0.001 R^2 = 0.0597, p < 0.001, R^2=0.0597, p<0.001		
Sample Size	383	Unstandardized Effect (ST → Slp_Dur)	-0.1963		
Bootstrap Samples	5000				
Confidence Level for Cis	95%	Standardized Coefficient	-0.2443 (moderate negative relationship)		
Indirect Effects (Mediation through Slp_Dur)	Indirect Effect (Unstd)	Indirect Effect (Std)	Boot LL	Boot UL	Sig.
Social Interaction (Sc_Int)	-0.1018	-0.1351	-0.1511	-0.0564	Yes
Mental Health (Mt_Hlth)	-0.1015	-0.1336	-0.1528	-0.0547	Yes
Binge Eating (Bng_Eat)	-0.1031	-0.131	-0.1505	-0.0583	Yes
Direct Effects (ST → DVs without Mediation)	Direct Effect (Unstd)	Direct Effect (Std)	LLCI	ULCI	Sig.
Social Interaction (Sc_Int)	-0.056	-0.0742	-0.1201	0.0082	No
Mental Health (Mt_Hlth)	-0.0757	-0.0996	-0.1401	-0.0113	Yes
Binge Eating (Bng_Eat)	-0.0584	-0.0741	-0.1262	0.0095	No

Total Effects (Direct + Indirect)	Total Effect (Unstd)	Total Effect (Std)	LLCI	ULCI	Sig.
Social Interaction (Sc_Int)	-0.1578	-0.2093	-0.2321	-0.0835	Yes
Mental Health (Mt_Hlth)	-0.1771	-0.2332	-0.2515	-0.1027	Yes
Binge Eating (Bng_Eat)	-0.1615	-0.2052	-0.2391	-0.0839	Yes

The results of this study help to render a detailed picture of the mediational pathways, with ST affecting three outcomes: Sc_Int, Mt_Hlth, and Bng_Eat. It also shows Slp_Dur as another mediator. Several findings have been established from this study, affirming this study and other related research work in the following ways.

The direct effect of screen time on sleep duration reflects a moderate negative relationship (B = -0.1963, p<0.001, B = -0.1963, p < 0.001, standardized coefficient = -0.2443) that shows that overall screen time decreases the amount of time spent on sleep substantially. This aligns with Woods and Scott (2016), who advocated that screen time interferes with circadian rhythms, leading to reduced melatonin synthesis and, hence, shorter and poor-quality sleep. Such sleep disturbances have feedback implications for mental health, as reviewed by Wu et al. (2015) who found that delayed bed usage time was related to short and continually interrupted sleep time as well as anxiety and depression.

The mediation relationships can also be evidenced through the indirect effects of sleep duration. As indicated by the shrinking of the bootstrapped confidence intervals (BootLLCI and BootULCI), all forms of dependent variables—social interaction (B = –0.1018, p < 0.05), mental health (B = –0.1015, B < 0.05), and night eating (B = –0.1031, p < 0.05)—showed significant mediation via night duration. These results align with the findings of Rubenking et al. (2018) and Rosenthal et al. (2021), which highlight that reduced sleep caused by extended screen time contributes to increased psychological stress and various behavioral issues. For example, binge eating was higher among people with poor sleep since distractions from screen time affected their eating and information-eating balance (Rubenking et al., 2018).

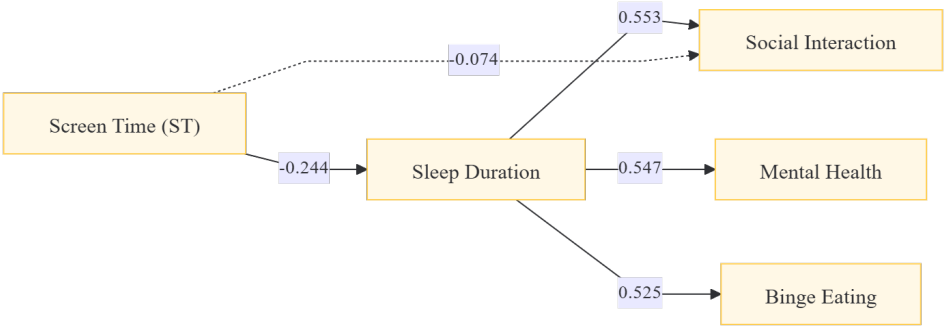
However, the direct impact of screen time on social interaction (B = -0.056, p > 0.05) and binge eating (B = -0.0584, p > 0.05) is insignificant. Meanwhile, the direct impact on mental dimension (B =−0.0757, p<0.05, B

= -0.0757, $p < 0.05$) is significant. This means that the effect of screen time on social interaction and binge eating is likely to be transmitted through the variable of sleep duration. Nonetheless, mental health has both a direct and an indirect impact on it. This is in agreement with Lemenager et al. (2020), who pointed out that the effect of exposure to screen-based media on psychological outcomes is explained by sleep disruption. Furthermore, Pittman and Reich (2016) mentioned that ideas behind the 'fear of missing out' are linked to decreased HCI and face-to-face communication, which increases feelings of loneliness and isolation through effects on sleep and emotions.

The total cost impacts are substantial for all dependent variables, and the tentative results include direct and indirect effects. The hours spent in front of different screens are significantly and overall, negatively related to social interaction ($B = -0.1578$, $p<0.05$), mental health ($B = -0.1771$, $p < 0.05$), and binge eating ($B = -0.1615$, $p < 0.05$). Such outcomes reflect the I-PACE model developed by Brand et al. (2019) that describes the impact of continued media consumption on behavior and emotion. In addition, they are relevant to studies such as Garbóczy et al. (2021) and Oswald et al. (2021), where text predicts the effects of screen time on psychological well-being that may be lost via disturbed schedules like sleep.

Figure 2

Path Diagram Showing Sleep Duration's Mediating Role in the Relationship Between Screen Time and Psychological Outcomes



Conclusion

The study conclusively demonstrates that screen time exerts a profound influence on the psychological health of university students, significantly impacting social interactions, mental health, and binge eating behaviors.

The findings highlight a critical indirect pathway where screen time affects these outcomes through sleep duration. Excessive nighttime screen exposure elevates anxiety levels, disrupts sleep quality, and contributes to poor dietary habits and feelings of loneliness. This is consistent with the studies by Woods and Scott (2016) and Rubenking et al. (2018) that record the cumulative detrimental implications of long-term screen time on psychological and behavioral performance trends. Concerning binge eating, one of the theories present in the study is a multidimensional process: on a psychological level, binge eating can be viewed as a method of stress reduction, whereas physiologically, the process can be described as the activation of the reward system of the brain by stimuli related to the screen, such as the presence of attractive content or notifications. This two-way passage deserves further exploration of its implications.

Implications

The implications of the results are enormous in educational institutions and healthcare practitioners. Colleges can go further than general recommendations such as awareness programs, and put specific and actionable programs into place. An example is that screen time can be depleted by introducing regular structured digital detoxification classes, scheduling the 30-minute prep-bed exercise, and forming screen-free zones in dormitories, among other things. Outdoor green spaces on campus as a setting to participate in nature walks or gardening clubs would also be in keeping with the concept of a green time and a practical contrast to digital time. Policy adaptations could involve the establishment of compulsory courses on digital literacy to empower students with the knowledge of healthy media consumption trends, including reducing exposure to blue light at night. Clinic-based counseling interventions must be developed around the interdependency of screen time, sleep deprivation, and mental health, to administer specific guidelines such as blue-light filtering or placing restrictions on when to use a screen. Nevertheless, the feasibility of proposed solutions will have to overcome real-life obstacles related to student opposition to change, the economic cost of creating green spaces, and faculty retraining in digital literacy that can be achieved with the careful planning of strategic change and involvement of stakeholders. At a larger scale, public health policies need to promote the idea of balanced screen usage among young adults to promote their overall well-being.

Future Directions

Future studies should consider a more detailed analysis where the effects of different types of screen time, such as social media and educational materials, are compared on the psychological health of different populations and in different cultures. Longitudinal studies are needed to determine causality, and small-scale intervention trials of such measures as screen-time limits and high-green time initiatives would provide useful evidence. Future studies that examine the effect variations among disciplines in universities, such as liberal arts versus technical schools, or research into how students perceive screen time addiction, could identify behavioral and emotional processes in the manifestation of screen time addiction. It will also be important to explore the addictive nature of the new forms of screens. Such focused attempts will delve into improving the knowledge base of the field and inform evidence-supported interventions.

Limitations

The cross-sectional study design does not allow one to infer causality between screen time and the psychological outcomes, and thus, longitudinal studies should be conducted. Self-reports of screen time and its impact may present a biased reaction; leading to possible falsification of data and its consequences. The sample of students just in universities might not be applicable outside this group of population or even to other age brackets. Moreover, sleep duration is a critical moderator; however, other unmeasured factors, such as character traits or social support may also play a role and deserve investigation in the future.

Implication

To prevent the negative impact of screen time on the well-being of students, universities in Pakistan must swiftly intervene with such measures as green time programs and digital literacy workshops.

Author Contributions

Nabeeha Rauf: conceptualization; writing – original draft; literature review. **Muhammad Salman:** formal analysis; writing – review & editing. **Kranthi Kumar Reddy Palem:** methodology; data collection. **Ayodeji Saraki:** writing – review & editing; proofreading.

Conflict of Interest

The authors of the manuscript have no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

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Data supporting the findings of this study will be made available by the corresponding author upon request.

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References

Asgher, S., & Gohar, I. (2022). Binge watching on internet television networks & its effects on youth. *Journal of Media & Communication*, *3*(1), 52–64.

Baiden, P., Tadeo, S. K., & Peters, K. E. (2019). The association between excessive screen-time behaviors and insufficient sleep among adolescents: Findings from the 2017 youth risk behavior surveillance system. *Psychiatry Research*, *281*, Article e112586.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182. https://doi.org/10.1037/0022-3514.51.6.1173

Brand, M., Wegmann, E., Stark, R., Müller, A., Wölfling, K., Robbins, T. W., & Potenza, M. N. (2019). The interaction of Person-Affect-Cognition-Execution (I-PACE) model for addictive behaviors: Update, generalization to addictive behaviors beyond internet-use disorders, and specification of the process character of addictive behaviors. *Neuroscience and Biobehavioral Reviews*, *104*, 1–10. https://doi.org/10.1016/j.neubiorev.2019.06.032

Çayci, B. (2021). The effects of changing forms of watching TV series as a result of binge-watching on the viewers. *Turkish Online Journal of Design Art and Communication*, *11*(2), 403–423. https://doi.org/10.36968/JPDC-V08-I02-27

Chen, Y., Li, Y., Li, S., He, M., Chen, Q., Ru, T., & Zhou, G. (2024). When and what: A longitudinal study on the role of screen time and activities in adolescent sleep. *Sleep Medicine*, *117*, 33–39.

Cohen, J. (2016). A power primer. In A. E. Kazdin (Ed.), *Methodological issues and strategies in clinical research* (4th ed., pp. 279–284). American Psychological Association. https://doi.org/10.1037/14805-018.

Delong, D., Edmiston, D., College, V., & Hightower, R. (2014, March 26–28). *Media bingeing: A qualitative study of psychological influences* [Paper presentation]. Proceedings of Marketing Management Association Spring Conference, Chicago, IL.

Deyo, A., Wallace, J., & Kidwell, K. M. (2024). Screen time and mental health in college students: Time in nature as a protective factor. *Journal of American College Health*, *72*(8), 3025–3032. https://doi.org/10.1080/07448481.2022.2151843

Garbóczy, S., Szemán-Nagy, A., Ahmad, M. S., Harsányi, S., Ocsenás, D., Rekenyi, V., Al-Tammemi, A. B., & Kolozsvári, L. R. (2021). Health anxiety, perceived stress, and coping styles in the shadow of the COVID-19. *BMC Psychology*, *9*(1), Article e53. https://doi.org/10.1186/s40359-021-00560-3 .

Ge, Y., Xin, S., Luan, D., Zou, Z., Bai, X., Liu, M., & Gao, Q. (2020). Independent and combined associations between screen time and physical activity and perceived stress among college students. *Addictive Behaviors*, *103*, Article e106224. https://doi.org/10.1016/j.addbeh.2019.106224

Hassan, A. A. U., Fazal, M., & Sheikh, M. A. (2024). Digital learning of children through YouTube: Perception of young parents in Lahore. *Online Media and Society*, *5*(1), 25–35. https://doi.org/10.71016/oms/nhfafr21

Karuza, V. (2020). Why binge-watching? The prominent motives and analysis of the motivating hedonic and eudaimonic elements of emotional gratification in a binge-watching experience. *Medijske Studije*, *11*(21), 3–23. https://hrcak.srce.hr/245564

Katz, E., & Blumler, J. G. (1974). *The uses of mass communication: Current perspectives on gratifications research*. Sage Publications.

Kondo, M. C., Jacoby, S. F., & South, E. C. (2018). Does spending time outdoors reduce stress? A review of real-time stress response to outdoor

environments. *Health & Place*, *51*, 136–150. https://doi.org/10.1016/j.healthplace.2018.03.001

Kottasz, R., Bennett, R., & Randell, T. (2019). Post-series depression: Scale development and validation. *Arts and the Market*, *9*(2), 132–151. http://dx.doi.org/10.1108/AAM-02-2019-0009

Lavados-Romo, P., Andrade-Mayorga, O., Morales, G., & Muñoz, S. (2021). Association of screen time and physical activity with health-related quality of life in college students. *Journal of American College Health*, *71*(5), 1504–1509. https://doi.org/10.1080/07448481.2021.1942006

Lee, S. S., Lingham, G., Wang, C. A., Torres, S. D., Pennell, C. E., Hysi, P. G., Hammond, C. J., Gharahkhani, P., Clark, R., Guggenheim, J. A., & Mackey, D. A. (2023). Changes in refractive error during young adulthood: the effects of longitudinal screen time, ocular sun exposure, and genetic predisposition. *Investigative Ophthalmology & Visual Science*, *64*(14), 28. https://doi.org/10.1167/iovs.64.14.28

Lemenager, T., Neissner, M., Koopmann, A., Reinhard, I., Georgiadou, E., Müller, A., Kiefer, F., & Hillemacher, T. (2020). COVID-19 lockdown restrictions and online media consumption in Germany. *International Journal of Environmental Research and Public Health*, *18*(1), Article e14. https://doi.org/10.3390/ijerph18010014

Li, C., Liu, D., & Dong, Y. (2019). Self-esteem and problematic smartphone use among adolescents: A moderated mediation model of depression and interpersonal trust. *Frontiers in Psychology*, *10*, Article e2872. https://doi.org/10.3389/fpsyg.2019.02872

Liu, Q., Zhang, Y., Lin, Y., You, D., Zhang, W., Huang, Q., van den Bosch, C. C. K., & Lan, S. (2018). The relationship between self-rated naturalness of university green space and students' restoration and health. *Urban Forestry & Urban Greening*, *34*, 259–268. https://doi.org/10.1016/j.ufug.2018.07.008

Memon, M. A., Ting, H., Cheah, J. H., Thurasamy, R., Chuah, F., & Cham, T. H. (2020). Sample size for survey research: Review and recommendations. *Journal of Applied Structural Equation Modeling*, *4*(2), 1–20. https://doi.org/10.47263/jasem.4(2)01

Oswald, T. K., Rumbold, A. R., Kedzior, S. G. E., & Moore, V. M. (2021). Mental health of young Australians during the COVID-19 pandemic: Exploring the roles of employment precarity, screen time, and contact with nature. *International Journal of Environmental Research and Public Health*, *18*(11), Article e5630. https://doi.org/10.3390/ijerph18115630

Pittman, M., & Reich, B. (2016). Social media and loneliness: Why an Instagram picture may be worth more than a thousand Twitter words. *Computers in Human Behavior*, *62*, 155–167. https://doi.org/10.1016/j.chb.2016.03.084

Pittman, M., & Sheehan, K. (2015). Sprinting a media marathon: Uses and gratifications of binge-watching television through Netflix. *First Monday*, *20*(10). https://doi.org/10.5210/fm.v20i10.6138

Rosenthal, S. R., Zhou, J., & Booth, S. T. (2021). Association between mobile phone screen time and depressive symptoms among college students: A threshold effect. *Human Behavior and Emerging Technologies*, *3*(3), 432–440. https://doi.org/10.1002/hbe2.256

Rubenking, B., Bracken, C. C., Sandoval, J., & Rister, A. (2018). Defining new viewing behaviors: What makes and motivates TV binge-watching? *International Journal of Digital Television*, *9*(1), 69–85. http://dx.doi.org/10.1386/jdtv.9.1.69_1

Smith, L., Jacob, L., Trott, M., Yakkundi, A., Butler, L., Barnett, Y., Armstrong, N. C., McDermott, D., Schuch, F., Meyer, J., López-Bueno, R., Sánchez, G. F. L., Bradley, D., & Tully, M. A. (2020). The association between screen time and mental health during COVID-19: A cross-sectional study. *Psychiatry Research*, *292*, Article e113333. https://doi.org/10.1016/j.psychres.2020.113333

Sohail, S. A., Mahmood, Q., Khan, M. H., & Gull, Z. (2019). Tinder use among Pakistani adults: a socio-psychological need perspective. *Jurnal Studi Komunikasi*, *3*(3), 316–331.

Starosta, J. A., & Izydorczyk, B. (2020). Understanding the phenomenon of binge-watching—a systematic review. *International Journal of Environmental Research and Public Health*, *17*(12), Article e4469. https://doi.org/10.3390/ijerph17124469

Sun, J. J., & Chang, Y. J. (2021). Associations of problematic binge-watching with depression, social interaction anxiety, and loneliness. *International Journal of Environmental Research and Public Health*, *18*(3), 1168. https://doi.org/10.3390/ijerph18031168

Vaterlaus, J. M., Spruance, L. A., Frantz, K., & Kruger, J. S. (2019). College student television binge-watching: Conceptualization, gratifications, and perceived consequences. *The Social Science Journal*, *56*(4), 470–479. https://doi.org/10.1016/j.soscij.2018.10.004

Woods, H. C., & Scott, H. (2016). #Sleepyteens: Social media use in adolescence is associated with poor sleep quality, anxiety, depression, and low self-esteem. *Journal of Adolescence*, *51*(51), 41–49. https://doi.org/10.1016/j.adolescence.2016.05.008

Wu, X., Tao, S., Zhang, Y., Zhang, S., & Tao, F. (2015). Low physical activity and high screen time can increase the risks of mental health problems and poor sleep quality among Chinese college students. *PLOS ONE*, *10*(3), Article e0119607. https://doi.org/10.1371/journal.pone.0119607

Yasir, A., Baloch, M., & Hassan, A. A. U. (2023). Disengagement of youth with student politics in Pakistan: A study of the experiences of politically engaged students. *Research Journal for Societal Issues*, *5*(3), 274–284. https://doi.org/10.56976/rjsi.v5i3.155