

Association between Screen time and Psychosocial Health: A Closer Look**Neeraj Singh****Military Hospital Devlali, Nashik, Maharashtra, India****Received: 25-10-2023 / Revised: 23-11-2023 / Accepted: 26-12-2023****Corresponding Author: Dr. Neeraj Singh****Conflict of interest: Nil****Abstract:**

Aim: The aim and objective were to obtain an association between screen time and the psychosocial morbidities of adolescent students. It is indicated in studies that there is a strong correlation between the amount of time spent on screens and mental health development issues such as attention deficit disorder, anxiety, and depression.

Method: The data collection took place in secondary classes students public or private schools in Deolali, who have enrolled in classes 7th to 12th (12-17 years only) and can communicate in English. A group of 1300 adolescents was assessed, with a M: F ratio of 1.23. The total number of male-to-female participants was 718 and 582, respectively.

Results: The PSC-Y scores were plotted against the gender of the participants, p-value 0.39. 154 female adolescents had positive scores as against 175 male participants. In the blood group, 'B' blood group 35.4% whereas 'O' 30.3% (p-value 0.77) statistically insignificant. The study found that most of these adolescents had psychosocial morbidity. The average weight was 48.5 kg with an SD of 12.4 kg. The increasing weight of participants had a highly significant relationship with positive PSC-Y scores (p-value 0.0000046). The family structure of the participating cohort was 16.7% living in joint families, 44 respondents had joint family structures, and 285 had nuclear families. The comparison on the X2 test was insignificant (p-value 0.58). 73.7% of participants reported with sleeping time of 6-8 hours. The distribution of sleep time was similar among both genders (p-value 0.0019),

Conclusion: The study found a significant association between increased screen time and adolescent psychosocial morbidity and potential approach could involve devising public health initiatives that specifically focus on reducing the amount of leisure time individuals spend in front of screens, particularly among this demographic.

Keywords: Reasoned Action Approach; Digital device; screen time; concurrent screen use; adolescent; correlates.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Researchers have found that various factors, such as emotional stability, are connected to an individual's psychological well-being, positive interpersonal relationships, and self-control. Indicators of flourishing and the diagnosis of mood disorders, anxiety, and depression demonstrate the presence or absence of an individual's psychological well-being.[1]

Observations have linked higher morbidity and mortality rates with low self-control, disrupted relationships, and intense emotional instability.[2] The risk of mental health like depression, anxiety, and mood disorders is significant and can result in non-suicidal self-harm practises, successful suicide attempts, and attempted suicides.[3]

Adolescence is a crucial and dynamic period of transition between childhood and adulthood. WHO categorizes adolescent age group between 10 to 19

years. [4] It is a highly impressionable period of life, and this development depends on physical, social, academic, emotional, and peer group relationships.

The world is undergoing rapid technological change with every passing decade, and the evolution of digital screen exposure has added a factor to this milieu. From passive watching of TV screens in living rooms to active involvement in consuming social media and use of laptops and PCs for academic work, the exposure to screen time has only grown in adolescents' lives [5]. Due to this increased exposure to screens, there is a growing concern about its possible ill effects on the psychosocial development of adolescents.

While a positive aspect of daily use can enhance learning and build community, it often interferes with all aspects of daily living, from the necessity

of sleep to creative endeavors and social engagements. The screen presents a poor substitute for the stimulation provided by real-world experiences. It has led to decreased REM sleep necessary for processing and storing short-term memory resulting in poor academic performance and dropped healthy social interactions and creative endeavors. Excessive involvement in the social networking sites of adolescents and technological dependency contribute to behavioral changes leading to technology addiction. It can lead to avoiding friends and family, inadequate sleep, and denying actual usage time spent on technological devices. In pursuit of technology, individuals often sacrifice once enjoyable activities.

Physical morbidities can include non-sinister headaches and vision problems with either new changes in visual acuity, eye strain, or tearing. Furthermore, reports indicate that these kids experience non-inflammatory pains, stiffness, numbness, and pain in their palms and fingers. Another common effect of excessive screen time has been the rise of sedentary behavior and the consequent prevalence of obesity among adolescents. These effects also cause an increased risk for diminished psychological well-being [6], depression [7], and even some types of cancers [8]. Depressed mood, depression syndromes, and depression disorders are all forms of depression that can appear. It is a significant global public health burden that affects adults, adolescents, and children. [9]

The juvenile depressive syndrome can result in impaired psychosocial functioning, substance abuse,[10] and an increased risk of suicide.[11] Increased screen time among adolescents could also contribute to anxiety and depression. According to social comparison and objectification theory, exposure to objectifying pictures of the human body and cyber bullying may be brought on by exposure to objectifying images of the human body [12].

Studies have shown that cyber bullying is associated with anxiety and depression in youth.[13] It increased concern amongst parents, teachers, educators, psychologists, and health professionals about the harmful effects of screen time.[14] In reaction to these findings, the AAP (American Academy of Pediatrics) has advised restricting kids' daily screen usage.[15] The World Health Organization has recently decided to include gaming disorder in the International Classification of Diseases (11th revision). [16]

The research on the possible association between screen time and psychosocial morbidity in adolescents needs to be more consistent. While some researchers report a positive association of screen time with low well-being [17], others take a completely different view of either nil or beneficial

effects of increased screen time [18]. Before presenting and addressing these issues with the parents during doctor visits, researchers should establish a firm conclusion regarding the restriction of screen usage in kids and teenagers. Other researchers take a similar position on classifying gaming disorders as mental health issues, maintaining that associations between gaming and psychological well-being are inconsistent enough to justify it [19].

Aim and Objectives

This study investigated the correlations between screen time and a broad range of psychological well-being measures, such as emotional stability, relationships with caregivers, self-control, and diagnoses of mood disorders, among adolescents aged 12 to 17 years in an Indian city. The study was conducted through a sizeable school-based survey.

Methods

The present study was a descriptive observational questionnaire-based study performed in community settings among students in secondary classes in public or private schools in Deolali. Adolescent students of selected schools who have enrolled in classes 7th to 12th (12-17 years only) and can communicate in English constituted the study population for the present investigation. Before the study, the researchers obtained proper approval from school officials and secured prior consent from both parents and students. The study excluded disabled children, students absent on the data collection day, and those who declined to participate.

Supplied students were with the proforma after taking oral consent. Use the self-reporting method to fill the proforma, including age, birth order, the kind of family, the monthly family income, the educational and employment position of the father and mother, and screen time. The observer calculated the sample size to estimate a 95% confidence interval for an association between screen time and the psychosocial morbidities of adolescent students. The study had a sample size of 400 students, which exceeded the calculated minimum sample size of 384. Researchers prepared the report using the analyzed data and drew inferences and conclusions. The researchers designed univariate and bivariate tables in the study.

The researchers noted all generated data on a proforma. The researchers developed an Excel data sheet to statistically analyze the collected data using Microsoft Windows using the Statistical Program for Social Sciences (SPSS Ver 22.0, IBM Company, USA). The researchers presented categorical variables as absolute values or percentages/proportions. The researchers expressed numerical variables as mean + standard deviation (SD) or median (range) based on the data distribu-

tion pattern and analyzed them using a two-sample t-test (Student's t). They used the Chi (χ^2) square test for skewed distributions and categorical variables.

Results:

Out of the 1450 eligible participants in the relevant age group from a single school in Deolali city, 48

were excluded based on the predetermined criteria, and 13 declined to participate. Additionally, 89 adolescents were excluded from the final analysis due to incomplete or multiple blank responses. Thus, a total of 1300 adolescent students were included in the study.

Table 1: Patient demography and other variables

	Variables	N=1300	Percentage
1.	Gender distribution		
	M	718	53
	F	582	47
2.	Age Distribution	14.04 + 1.63 years	
3.	Weight Distribution	48.48 kg + 12.37 kg	
4.	Blood group		
	A	302	23.2
	AB	144	11.1
	B	460	35.4
	O	394	30.3
5.	Outdoor play		
	< 2 hours	1090	83.8
	> 2 hours	210	16.2
6.	Sleep time		
	< 6 hours	142	10.9
	6-8 hours	958	73.7
	> 8 hours	200	15.4
7.	Screen time		
	< 6 hours	537	41.3
	6-8 hours	487	37.5
	8-10 hours	196	15.1
	> 10 hours	80	6.2
8.	Family Structure		
	Joint	186	14.3
	Nuclear	1114	85.7
9.	Educational status of parents (N=2600)		
	XII or below	1287	49.5
	Graduate	950	36.5
	Post-graduate	356	13.7
	Unknown	7	0.3

Paediatric symptom Checklist-youth report was generated for all participants. This checklist has thirty-five questions with standard three responses.

Table 2: Responses to PSC-Y questionnaire

S No	Question	Never	Sometimes	Often
1	Complain of aches or pains	568	649	83
2	Spend more time alone	473	615	212
3	Tire easily, little energy	565	595	140
4	Fidgety, you are unable to sit still	620	467	213
5	Have trouble with teacher	889	356	55
6	Less interested in school	805	407	88
7	You act as if you are driven by a motor	840	360	100
8	You daydream too much	559	549	192
9	You get distracted easily	316	695	289
10	You are afraid of new situations	504	643	153
11	You feel sad, unhappy	355	796	149
12	You get irritable or angry	240	771	289
13	You feel hopeless	620	554	126

14	Have trouble concentrating	456	654	190
15	Less interested in friends	886	282	132
16	Fight with other children	896	356	48
17	You want to miss classes	766	406	128
18	School grades dropping	412	724	164
19	You look down on yourself	689	492	119
20	Visit doctor with doctor finding nothing wrong	963	264	73
21	Have trouble sleeping	826	377	97
22	Worry a lot	491	611	198
23	Want to be with parent more than before	252	582	466
24	Feel that you are bad	735	472	93
25	Take unnecessary risks	671	525	104
26	Get hurt frequently	563	561	176
27	Seem to be having less fun	567	733	0
28	Act younger than children your age	691	483	126
29	Do not listen to rules	707	492	101
30	Do not show feelings	454	597	249
31	Do not understand other people's feelings	629	529	142
32	Tease others	893	360	47
33	Blame others for your troubles	938	313	49
34	Take things that do not belong to you	1060	213	27
35	Refuse to share	817	407	76

329 children with positive responses towards at least twenty-eight variables were considered to have significant morbid symptomatology. These responses were further evaluated against baseline profile.

Table 3: Comparison of PSC-Y scores with patient variables

	Variables	Insignificant (<28) (N=971)	Significant (≥28) (N=329)	p-value
1.	Gender distribution			
	Female	428	154	0.39
	Male	543	175	
2.	Age Distribution (years)	13.8 + 1.58	14.6 + 1.65	<0.0001*
3.	Weight Distribution (kg)	47.0 + 11.5	52.8 + 13.7	<0.0001*
4.	Blood group			
	A	231	71	0.77
	AB	109	35	
	B	343	117	
	O	288	106	
5.	Outdoor play			
	< 2 hours	809	281	0.37
	> 2 hours	162	48	
6.	Sleep time			
	< 6 hours	89	53	0.0019*
	6-8 hours	733	225	
	> 8 hours	149	51	
7.	Screen time			
	< 6 hours	435	102	<0.0001*
	6-8 hours	370	117	
	8-10 hours	124	72	
	> 10 hours	42	38	
8.	Family Structure			
	Joint	142	44	0.58
	Nuclear	829	285	
9.	Educational status of parents (N=2600)			
	XII or below	405	131	0.24
	Graduate	432	140	
	Post-graduate	134	58	

Discussion

This study aimed to investigate how screen time impacts the psycho-social profiles of adolescents, as well as identify any other contributing factors. A group of 1300 adolescents was assessed, with a M: F ratio of 1.23. The total number of male-to-female participants was 718 and 582, respectively. The PSC-Y scores were plotted against the gender of the participants. The resulting data evaluation revealed that the distribution of scores was not statistically significant, as indicated by a p-value of 0.39. 154 female adolescents had positive scores as against 175 male participants.

The age group studied in the project was 12 to 17 years, with the maximum representation from 12 to 14 years at 62.3%. The cohort's mean was 14.04 years, with a standard deviation (SD) of 1.63 years. The scores obtained from the PSC-Y checklist were examined with the participant's age, and there was a negative correlation, meaning that as the age of the participants increased, their scores on the checklist decreased. The relationship was assessed with the X² test and a highly significant p-value approaching 0.00 was noted. Twenge et al. [20], reporting on a large cohort of American children and adolescents, noted higher screen use with increasing age groups. He also reported that screen time use of more than one hour in these adolescents was associated with lower psychological well-being, lower self-control, emotional stability, inability complete task, and difficulty in making friends.

Maximum representation among the participating adolescents was for the 'B' blood group (35.4%). 'O' was the next most expected blood group, representing 30.3%. A correlation between the blood group and PSC-Y scores was not observed, as the resulting p-value of 0.77 was statistically insignificant. Most of the participants in the group had weights between 30-60 kg (80.2%). There were only 5 participants who weighed 100 kg or more. The study found that most of these adolescents had psychosocial morbidity. The average weight was approximately 48.5 kg with an SD of 12.4 kg. The increasing weight of participants had a highly significant relationship with positive PSC-Y scores (p-value 0.0000046). Suchert et al. similarly described screen time sedentary Behaviours associated with obesity, which is related to the opposing body and mental health image [21]. Denepitiya et al., in their study of obese Sri Lankan adolescents, found a significant correlation between sedentary screen time habits and severe physical and psychosocial morbidity [22].

The family structure of the participating cohort was overwhelmingly deviated towards nuclear families, with only 16.7% reporting to be living with extended or joint families. Amongst the participants with

positive scores, 44 respondents had joint family structures, and 285 had nuclear families. The comparison on the X² test was insignificant, with a p-value of 0.58. The design of the family had no bearing on poor PSC-Y scores. Fathers generally had the educational status of graduates or post-graduates, whereas mothers had an education of XII or lesser. The academic standing of fathers and mothers had no significant correlation with adolescents' PSC-Y scores.

73.7% of participants reported an average sleeping time of 6-8 hours. The distribution of sleep time was similar among both genders. With a p-value of 0.0019, the sleep duration significantly impacted PSC-Y scores that were inferior or positive. Of 142 respondents with less than 6 hours of sleep, 53 had positive PSC-Y scores.

Parent et al. [23] evaluated the indirect effect of screen time on behavioral problems by estimating its impact on sleep in children and adolescents. Out of 210 adolescents studied, they observed reduced sleep time and consequent behavioral issues when the screen time exceeded 8-10 hours. This dose-based relationship was even lesser in the case of pre-adolescents and children. Foerster et al. reporting on 843 children enrolled in the Swiss HERMES cohort, reported increased nocturnal awakenings, disturbed sleep, and increased health issues such as headaches, tiredness, lack of energy, and concentration along with poor well-being [24].

Most respondents reported exposure time to digital screens and devices as either less than six hours or between 6-8 hours. The study said that exposure to digital screens was higher in males than females. The study found a strong correlation between screen time and PSC-Y scores, indicating a significant level of psychosocial morbidity among adolescents with longer screen time. Almost 37% of adolescents with digital screen time exposure of 8-10 hours and 47.5% with exposure of >10 hours had poorer PSC-Y scores. All the adolescents reported less than two hours of outdoor play duration. Twenge et al. [20-64] noted that in adolescents over 14 years of age, a high screen time (more than 7 hours) had twice the incidence of depression, anxiety, mental health consultation, and history of use of psychiatric medications. Lapiere et al. noted increasing smartphone usage in late adolescents with poor psychological well-being, loneliness, and depressive symptoms [25].

In a meta-analysis by Liu et al. [26], screen time over one hour they have had a linear reciprocal relationship with symptoms of depression and poor mental health. This risk for depression was strongly positive for adolescents under 14 years of age. Similarly, another meta-analysis by Zhai et al. reported a significant association of sedentary screen-based time with depressive symptoms [27].

In a review of three studies on adolescent girls, Costigan et al. found a positive association of screen-based sedentary behaviour with poor psychosocial health, including depression [28].

Conclusion

The study found a significant association between increased screen time and adolescent psychosocial morbidity. Furthermore, the prevalence of psychosocial morbidity was higher among late adolescents (aged 15-17 years) than early adolescents (aged 12-14 years).

Given these findings, it is suggested that specific interventions be directed towards delinquent and anti-social behaviour among adolescents while also considering the role of screen time as a potential cause and target for intervention.

Additionally, the study revealed that obesity, which may lead to poor self-image, is highly associated with a poor psychosocial profile. As such, it is imperative to examine obesity as a potential cause of juvenile delinquent behaviour and consider interventions to address this issue.

References

- Manderscheid RW, Ryff CD, Freeman, E.J., McKnight-Eily, L.R., Dhingra, S., Strine, T.W., Evolving definitions of mental illness and wellness. *Prev. Chronic Dis.* 2010;7: A19.
- Graham EK, Rutsohn JP, Turiano NA, et al. Personality predicts mortality risk: an integrative data analysis of 15 international longitudinal studies. *J Res Pers.* 2017; 70:174–186.
- Hawton K, Casanas I, Conabella C, Haw C, Saunders K. Risk factors for suicide in individuals with depression: a systematic review. *J Affect Disord.* 2013; 147:7–28.
- WHO The reproductive health of adolescent a strategy for action: A joint WHO/ UNICEF statement 1989;7.
- Galpin A, Taylor G. Changing behaviour: Children, adolescents and screen use. The British Psychological Society, www. bps. org. uk/news-and-policy/changing-behaviour-children-adolescentsand-screen-use. 2018.
- Costigan SA, Barnett L, Plotnikoff RC, et al. The health indicators associated with screen-based sedentary behavior among adolescent girls: a systematic review. *J Adolesc Health.* 2013; 52:382–92.
- Hamer M, Stamatakis E. Prospective study of sedentary behavior, risk of depression, and cognitive impairment. *Med Sci Sport Exer.* 2014; 46:718–23.
- de Rezende LF, Rodrigues Lopes M, Rey-López JP, et al. Sedentary behavior and health outcomes: an overview of systematic reviews. *PLoS ONE.* 2014; 9:e105620.
- Compas BE, Ey S, Grant KE. Taxonomy, assessment, and diagnosis of depression during adolescence. *Psychol Bull.* 1993; 114:323–44.
- Hersh J, Curry JF, Kaminer Y. What is the impact of comorbid depression on adolescent substance abuse treatment? *Subst Abus.* 2014; 35:364–75.
- Hawton K, van Heeringen K. Suicide. *Lancet.* 2009; 373:1372–81.
- Kowalski RM, Limber SP. Psychological, physical, and academic correlates of cyberbullying and traditional bullying. *J. Adolesc. Health.* 2013; 53 (1 Suppl.); S13–S20.
- Dakanalis A, Clerici M, Caslini M, et al. Internalization of sociocultural standards of beauty and disordered eating behaviours: the role of body surveillance, shame and social anxiety. *J. Psychopathol.* 2013:1–5.
- Kardaras N. *Glow Kids: How Screen Addiction is Hijacking Our Kids – And How to Break the Trance.* St. Martin's Griffin, New York. 2017.
- Radesky J, Christakis D. Media and young minds. Policy statement of the American Academy of Pediatrics. *Pediatrics* 2016;138.
- WHO: World Health Organization, 2018. Gaming disorder: online Q&A. <http://www.who.int/features/qa/gaming-disorder/en/> (January).
- Babic MJ, Smith JJ, Morgan PJ, Eather N, Plotnikoff RC, Lubans DR. Longitudinal associations between changes in screen-time and mental health outcomes in adolescents. *Ment Health and Phys Act.* 2017; 12:124–131.
- Przybylski AK, Weinstein N. A large-scale test of the Goldilocks hypothesis: quantifying the relations between digital-screen use and the mental well-being of adolescents. *Psychol Sci.* 2017; 28:204–215.
- Van Rooij AJ, Ferguson CJ, Carras MC, et al. A weak scientific basis for gaming disorder: let us err on the side of caution. *J Behav Addict.* 2018; 7:1–9.
- Twenge JM, Spitzberg BH, Campbell WK. Less in-person social interaction with peers among US adolescents in the 21st century and links to loneliness. *J. Soc. Pers. Relat.* 2019; 36:1892–1913.
- Suchert V, Hanewinkel R, Isensee B. Sedentary behavior and indicators of mental health in school-aged children and adolescents: a systematic review. *Preventive Medicine,* 2015a; 76:48-57.
- Denipitiya D, Fernando M, Wickramasinghe P. Technological and electronic communication device addiction and its associated physical and psychosocial comorbidity among obese and overweight children aged 10 to 14 years, who attend the nutrition clinic at Colombo North Teaching Hospital. *Sri Lanka Journal of Child Health.* 2020; 49(4):375-82.

23. Parent BA, Weasley-Sanders MA, Forehand R. Youth screen time and behavioral health problems: the role of sleep duration and disturbances. *J. Dev. Behav. Pediatr.* 2016;37(4):277–284.
24. Foerster M, Henneke A, Chetty-Mhlanga S, Rössli M. Impact of adolescents' screen time and nocturnal mobile phone-related awakenings on sleep and general health symptoms: a prospective cohort study. *International journal of environmental research and public health.* 2019; 16(3):518.
25. Lapierre MA, Zhao P, Custer BE. Short-term longitudinal relationships between smartphone use/dependency and psychological well-being among late adolescents. *Journal of Adolescent Health.* 2019; 65(5):607-12.
26. Liu M, Wu L, Yao S. Dose-response association of screen time-based sedentary behaviour in children and adolescents and depression: a meta-analysis of observational studies. *Br. J. Sports Med.* 2015; 50(20):1252–1258.
27. Zhai L, Zhang Y, Zhang D. Sedentary behaviour and the risk of depression: a meta-analysis. *British journal of sports medicine.* 2015; 49(11):705-9.
28. Costigan SA, Barnett L, Plotnikoff RC, et al. The health indicators associated with screen-based sedentary behavior among adolescent girls: a systematic review. *J Adolesc Health* 2013; 52:382–92.