

# Screen media-based devices usage patterns: Comparison between digital immigrant parents and digital native adolescents

Nandhini Priya <sup>1\*</sup>, P. Uma Maheswari <sup>1</sup>

<sup>1</sup> Department of Media Sciences, Anna University, Chennai, Tamil Nadu, INDIA

\*Corresponding Author: [priyanandhu01@gmail.com](mailto:priyanandhu01@gmail.com)

**Citation:** Priya, N., & Maheswari, P. U. (2024). Screen media-based devices usage patterns: Comparison between digital immigrant parents and digital native adolescents. *Journal of Digital Educational Technology*, 4(1), ep2411. <https://doi.org/10.30935/jdet/14463>

## ARTICLE INFO

Received: 22 Jan. 2024

Accepted: 02 Apr. 2024

## ABSTRACT

Smartphones are frequently the subject of digital screen media-based research due to their popularity. Other screen devices, such as computers, conventional TV, laptops, smart TV, and tablets, which have a significant impact on children's and adolescents' psychological behaviors, are rarely covered. Parents are considered the active agents who can regulate adolescents screen-based media use and control online risks. Parents of adolescents in developing countries are digital immigrants, and their consumption patterns of screen devices must be studied before exploring their media usage regulatory strategies for children and adolescents. To gather information on screen device usage patterns, including availability, usage, ownership, and screen time, a quantitative technique approach was used in the study. A statistical analysis was performed on survey data collected from 447 parent-adolescent dyadic samples (n=894). Results show a positive association between socio-economic status and the number of screen devices present in households. Parents and adolescents spend the same amount of screen time on conventional TV and smart TV as they do on smartphones. Tablets were the least used, but they had more screen time than laptops and computers. Screen time is associated with the intended use of the device. Screen time spent per device by digital immigrant parents is quite like that of their digital-native adolescents. Girls use smartphones often; boys spend more screen time with them. Parents' screen-based media usage practices should also be regulated, as they highly influence their children's screen time.

**Keywords:** screen devices usage, parent-adolescent, screen time, gender, digital immigrants, digital media

## INTRODUCTION

Technological convergence enhances the access to different technologies in one single device, which has now evolved as a digital screen device with a calculator, camera, video player, phone, the Internet, and so on. Smart TV, computer, laptop, and tablet are some of the other popular digital screen devices. Social or organic convergence promotes the performance of multiple technological tasks simultaneously on a single device, such as watching a movie, chatting with a friend, and editing a video at the same time by switching tasks in between (Jenkins, 2006; Miller, 2020). Though the recent information and communication technologies provide the ability to access content in different multimedia forms on the basis of media convergence, there are certain exclusive features carried by each screen device that are different from other devices and thereby increase the need for owning and consuming many screen devices by a single user; the choice of using a device significantly differs with the

user's activities involved (Bröhl et al., 2018; Dearman & Pierce, 2008). Depending on individual demands, each member of a family uses a variety of screen devices; however, smartphones have received most attention. These days, Smartphones are more than simply tools for communication; they are tiny computers with the ability to access information, entertain, handle finances, and even operate our houses. Because of their extensive use, they are a hot topic for study in several academic fields, including communication studies, computer science, psychology, and sociology. Scholars possess a keen interest in the ways that smartphones impact people and the community at large (Griffioen et al., 2021; Rather & Rather, 2019). At the same time, it is equally important to understand what role other screen devices play in people's everyday lives and to investigate their impact.

Research across various countries collectively indicates that almost 89.0% of teens use a touch screen device before sleep and place it nearby during bedtime (Carter et al., 2016). Higher levels of screen time are positively associated with sleep disturbances and behavioral problems (Nagata et al.,

This study is a part of the first author's doctoral thesis.

2022; Parent et al., 2016). Few studies clarify that not all digital media activities were related to sleep disturbance and loneliness. Gadget usage that involved one-to-one communication, texting, watching funny videos, and video chatting has helped children and youngsters overcome loneliness (Karsay et al., 2019). and promote happiness, but at the same time, addictive social media use and binge watching prove to bring adverse outcomes such as fear of missing out and comparison with online friends that are negatively associated with mental health (Cauberghe et al., 2020; Marciano et al., 2021).

Adolescents were more involved in addictive screen media use and watching videos/movies due to isolation than in texting or video chatting (Shawcroft et al., 2022). More screen time is common among children who are older, obese, and overweight, born to a single parent, and have less physical activity and low sports participation (Allen & Vella, 2015; Azadfallah et al., 2021). Some of the parental factors that are associated with adolescent screen time include parents' age, education, job nature, and socio-economic status (SES) (Bernard et al., 2017; Matarma et al., 2016). With the increasing reliance on screen device usage and marketing strategies that keep people addicted, it is necessary to regulate adolescents' online presence and screen device usage, as they are in the emotional development stage of their lives.

Psychiatrists and psychologists emphasize the value of parental involvement in limiting children's and adolescents' use of digital screen devices. To protect the mental and physical well-being of adolescents, they demand that parents monitor, control, and regulate how their children use digital devices (Bozzola et al., 2019; Spina et al., 2021). To balance and create a safe media consumption environment for children and adolescents, several researchers have repeatedly stressed the significance of open family communication and parents' adoption of rules and restrictions in screen device use (Parent et al., 2016; Reid Chassiakos et al., 2016).

Rarely have studies concentrated on parents' screen device usage habits, making it crucial to comprehend their degree of involvement with screens to better grasp how parents are regulating their own screen time and their ability to regulate their adolescents. Additionally, individuals born after 1980 are referred to as first generation digital natives (those who were born with digital technologies around) in western countries (Joiner et al., 2013; Prensky, 2001), whereas in many developing countries, people born till mid 1990s are all digital immigrants only due to the delayed digital revolution.

Like many developing countries, India's digital journey began almost two decades later, compared to Western countries. As the "technology leapfrog" theory suggests, India leapfrogged into mobile technology adoption, facing the Internet and digital revolution together in terms of digital transformations as it entered the market later. Though people born after the 1995s qualify as India's first-generation digital natives, technology access was limited to only a very few people due to India's larger political and economic divide. Ideally, people born between 1995 and the late 2000s are the first-generation digital natives in India (Darbha & Rao, 2016; Fong, 2009). This study includes parent samples, who are all digital immigrants, and adolescent samples, who are all digital natives, to test the status of the digital divide. This study

compares the screen device usage patterns of digital immigrant parents and digital native adolescents, proposing the following hypotheses.

- H1.** Adolescents are major users of screen devices compared to their parents.
- H2.** Parent ownership of screen devices is higher than adolescents.
- H3.** Adolescents spend more screen time with each device compared to their parents.

The relationship between gender and screen time is inconsistent with many studies. Some studies have concluded there is no relation; some have stated that girls have addictive social media use (Cudo et al., 2020), while others state boys spending more screen time (Allen & Vella, 2015; Downing et al., 2017; Munaro et al., 2016; Stald et al., 2014). According to a few studies, mothers use digital media frequently and spend more time on screens (Dennis et al., 2022). This study also analyzed the gender role in screen device consumption patterns with the hypothesis,

- H4.** Gender differences exist in screen time between parents and adolescents.

## METHODOLOGY

### Participants & Procedure

This study adopted a quantitative method to collect data from parents and their adolescent children to test the hypotheses stated. Since the study involves analyzing device usage preference, screen time spent with devices, and comparison between parents' and adolescents' usage patterns among a larger sample, a quantitative approach was chosen for data collection, analysis, and result interpretation. The study was carried out at two urban schools and two rural schools in the southern part of India.

A total of 480 survey questionnaires (parent survey + adolescent survey) were distributed through stratified sampling and circulated among adolescent students in the 9<sup>th</sup> to 12<sup>th</sup> grades. Each school carried 120 questionnaires, and 30 were given to the volunteer students in each grade, of whom 15 were boys and 15 were girls. Students were clearly explained how to fill out the forms, and they were also given an instructional video that contained directions regarding filling out the form. One parent of the participating adolescent was instructed to complete a parent copy of the survey. Parents also shared an instructional video online guiding them on filling out the survey form.

After filtering out the incomplete survey forms, a sample of 447 parent-adolescent dyadic reports were accounted for in the study. Concerned school authority permission and individual consent were collected from all the respondents on their willingness to provide study-related data. As the study involved adolescent children, parent consent was obtained before proceeding with the survey. Parents of the volunteered children for the study were contacted through communication apps (e.g., WhatsApp) and phone calls, and their consent was received in writing for their participation and their children's participation in the study.

**Table 1.** Descriptive statistics of parents & adolescents

Characteristics	Parents (n=447)			Adolescents (n=447)		
	Levels	Frequency (n)	Percentage (%)	Levels	Frequency (n)	Percentage (%)
Place	Urban	225	50.30	Urban	225	50.30
	Rural	222	49.60	Rural	222	49.60
Gender	Fathers	192	43.00	Boys	212	47.40
	Mothers	255	57.00	Girls	235	52.60
Age	<30	4	0.89	13	26	5.81
	30-40	216	48.30	14	102	22.80
	40-50	206	46.00	15	125	27.90
	50-60	20	4.47	16	118	26.30
	>60	1	0.22	17	76	17.00
Socio economic status	Upper	0	0.00	Upper	4	0.89
	Upper middle	41	9.17	Upper middle	70	15.60
	Lower middle	107	23.90	Lower middle	125	27.90
	Upper lower	269	60.20	Upper lower	225	50.30
	Lower	30	6.71	Lower	23	5.14
Screen devices count	Six	2	0.44	Six	2	0.44
	Five	8	1.78	Five	6	1.34
	Four	6	1.34	Four	9	2.01
	Three	54	12.10	Three	80	17.80
	Two	308	68.90	Two	281	62.80
One	69	15.40	one	69	15.40	

Note. Adolescent samples include from class 9<sup>th</sup> to 12<sup>th</sup>. 9<sup>th</sup>=106 (23.7%); 10<sup>th</sup>=118 (26.3%); 11<sup>th</sup>=116 (25.95%); & 12<sup>th</sup>=109 (24.3%)

## Measures

Socio-demographic variables, age, region, gender, and SES were collected as socio-demographic variables. All these variables were measured categorically. Adolescent age was measured on an ordinal scale from 13 to 17, and parent age was measured into five groups from less than 30 to above 60, as shown in **Table 1**. The region was measured in categorical terms urban and rural. The socio-economic measuring scale questionnaire was adopted from the modified Kuppaswamy scale 2020 (Saleem, 2020). This scale collectively measures the family head's occupation, education, and family monthly income categories as scores. Depending on total score obtained, SES is classified into five categories (1=lower, 2=upper lower, 3=lower middle, 4=upper middle, and 5=upper). Gender was measured categorically, as 1=boy/father and 2=girl/mother.

Screen device usage related variables: Six screen devices were considered for this study (1=conventional TV, 2=smart TV, 3=computer, 4=laptop, 5=tablet, and 6=smartphone). For each screen device, information about its availability, use, ownership, screentime, and intended purpose of use was gathered from adolescents and their parents. The availability, usage, and ownership of devices were measured as dichotomous variables (0=no, 1=yes). Screentime was measured on a Likert scale (1=less than an hour, 2=one to two hours, 3=two to three hours, 4=three to four hours, and 5=more than four hours). Intended device usage purpose was measured as a categorical variable on binary scales of 1=yes and 0=no (professional, educational, communication, entertainment, personal use, and playing games).

## Statistical Analyses

Descriptive statistics were used to present the socio-demographic data of both parents and adolescents. The Chi-square ( $X^2$ ) test was used to analyze the difference between screen device characteristics between parents and adolescents.



















The Kruskal-Wallis H test was used to compare screentime spent per device between parents and adolescents. Linear regression analysis was used to study the influence of SES on the number of devices available at home. The Mann-Whitney U test was used to analyze the relation between device ownership and screentime among parents and adolescents.

## RESULTS

**Table 1** shows the descriptive statistics for parents and adolescents. 50.3% of the sample belonged to urban areas and 49.6% to rural areas; 52.6% of adolescents were girls, and 57.0% of parents were mothers. 94.3% of the parents' age group was between 30-50 years and almost 60.0% of the adolescents' age group was between 14-16 years. Most of the sample (parents: 60.2% and adolescents: 50.3%) belonged to the upper-lower class, which ranked 4<sup>th</sup> out of five SES. On average, between the parent and adolescent samples, 66.0% of the dyads reported that they had two screen devices at home. 15.0% had only one screen device, which was a smartphone, and another 15.0% reported that they had three screen devices. Around 3.5% had four or five screen devices, and less than 1.0% had six screen devices at home. Results showed that there was no significant difference between the descriptive statistics data provided by parents and adolescents. There was a positive correlation between SES and number of devices in a household. Results from adolescents' data indicate  $R^2=0.077$ ,  $F(1, 445=37.223)$ ,  $p<.001$ ,  $\beta=0.278$ . Similar results were obtained from parents:  $R^2=0.060$ ,  $F(1, 445=28.643)$ ,  $p<.001$ ,  $\beta=0.246$  and dyad data:  $R^2=0.070$ ,  $F(1, 892=67.580)$ ,  $p<.001$ ,  $\beta=0.256$ .

Data provided for screen devices availability at home was similar between parents and adolescents, which was tested using Chi-square test. Many of the families, according to parents' reports, had smartphones (96.6%), followed by conventional television (73.6%), smart TV (19.9%), laptops (12.5%), computers (7.1%), and tablets (2.5%) (**Table 2**).

**Table 2.** Comparison between parents & adolescents

Screen devices	Total sample (n=894)			Parents (n=447)			Adolescents (n=447)		
	Parents (n=447)	Adolescents (n=447)	$X^2$ (df=1)	Fathers (n=192)	Mothers (n=255)	$X^2$ (df=1)	Boys (n=212)	Girls (n=235)	$X^2$ (df=1)
	n (%)	n (%)		n (%)	n (%)		n (%)	n (%)	
<b>Devices available</b>									
 TV	324 (72.50)	329 (73.60)	0.14	144 (75.00)	180 (70.60)	1.07	151 (71.20)	178 (75.70)	1.18
 SMART TV	84 (18.80)	89 (19.90)	0.18	36 (18.80)	48 (18.80)	0	43 (20.30)	46 (19.60)	0.04
 COMPUTER	22 (4.90)	32 (7.10)	1.97	13 (6.80)	9 (3.50)	2.46	16 (7.50)	16 (6.80)	0.09
 LAPTOP	48 (10.70)	56 (12.50)	0.70	18 (9.30)	30 (11.80)	0.65	28 (13.20)	28 (11.90)	0.17
 TABLET	10 (2.20)	11 (2.50)	0.05	5 (2.60)	5 (1.20)	0.21	5 (2.40)	6 (2.60)	0.02
 SMARTPHONE	436 (97.50)	432 (96.60)	0.63	188 (97.90)	248 (97.30)	0.20	199 (93.90)	233 (99.10)	9.59***
<b>Devices used</b>									
 TV	296 (66.20)	302 (67.50)	0.18	129 (67.20)	167 (65.50)	0.14	136 (64.20)	166 (70.60)	2.14
 SMART TV	68 (15.20)	81 (18.10)	1.36	26 (13.50)	42 (16.50)	0.73	38 (17.90)	43 (18.30)	0.10
 COMPUTER	10 (2.20)	22 (4.90)	4.67*	6 (3.10)	4 (1.60)	1.21	11 (5.20)	11 (4.70)	0.61
 LAPTOP	28 (6.30)	49 (10.90)	6.27*	13 (6.80)	15 (5.90)	0.147	26 (12.30)	23 (9.80)	0.70
 TABLET	4 (0.90)	9 (2.00)	1.95	1 (0.50)	3 (1.20)	0.53	4 (1.90)	5 (2.10)	0.33
 SMARTPHONE	407 (91.10)	431 (96.40)	10.97***	177 (92.20)	230 (90.20)	0.53	199 (93.90)	232 (98.70)	7.61**
<b>Devices owned</b>									
 TV	181 (40.40)	36 (8.05)	127.95***	84 (43.80)	97 (38.00)	1.48	18 (8.50)	18 (7.70)	0.11
 SMART TV	35 (7.82)	9 (2.01)	16.16***	13 (6.80)	22 (8.60)	0.52	3 (1.40)	6 (2.60)	0.73
 COMPUTER	4 (0.89)	5 (1.11)	0.11	3 (1.60)	1 (0.40)	1.69	4 (1.90)	1 (0.40)	2.15
 LAPTOP	13 (2.90)	18 (4.02)	0.84	8 (4.20)	5 (2.00)	1.89	5 (2.40)	13 (5.50)	2.90
 TABLET	3 (0.67)	5 (1.11)	0.51	1 (0.50)	2 (0.80)	0.11	1 (0.50)	4 (1.70)	1.53
 SMARTPHONE	318 (71.10)	186 (41.60)	79.25 ***	143 (74.50)	175 (68.60)	1.83	93 (43.90)	93 (39.60)	0.85

Note. Chi-square test was performed for comparison: \* $p < 0.50$ ; \*\* $p < 0.010$ ; & \*\*\* $p < 0.001$

On comparing the devices used between parent-adolescent dyads, there was a significant difference for three devices, where adolescents were using them more than their parents, computer,  $X^2(1)=4.670$ ,  $p=0.020$ ,  $\phi=0.070$ ; laptop,  $X^2(1)=6.270$ ,  $p=0.040$ ,  $\phi=0.080$ ; smartphone,  $X^2(1)=10.970$ ,  $p < 0.001$ ,  $\phi=0.110$ . These results partially support **H1** that adolescents are major users of screen devices compared to their parents.







On comparing device ownership between parent-adolescent dyads, Chi-square test results showed that parents largely owned conventional TV, smart TV and smartphones compared to their adolescents. The significant difference for conventional TV ownership was determined by  $X^2(1)=127.950$ ,  $p < 0.001$ ,  $\phi=0.378$ ; for smart TV ownership by  $X^2(1)=16.159$ ,  $p < 0.001$ ,  $\phi=0.134$ ; for smartphone ownership by  $X^2(1)=79.250$ ,  $p < 0.001$ ,  $\phi=0.298$ . These findings partially support **H2** that parents own more screen devices than adolescents.

**Table 2** also shows the comparison of screen devices available, used, and owned between fathers and mothers and boys and girls. There was no significant gender difference among parents and adolescents (except for smartphones) on screen devices availability, usability, and ownership pattern. The smartphone was the only screen device that showed a significant difference between boys and girls.

Smartphones were more available in the girls' homes ( $X^2[1]=9.590$ ,  $p < 0.001$ ,  $\phi=0.146$ ), and girls highly preferred often using smartphones more than boys ( $X^2[1]=7.610$ ,  $p=0.008$ ,  $\phi=0.131$ ). Girls' ownership of laptops was also considerably higher than boys,  $X^2(1)=2.900$ ,  $p=0.060$ .

Screentime spent was compared across the six screen devices for both parents and adolescents separately using the Kruskal-Wallis H test. Parents' screentime across the six different screen devices was significantly different ( $X^2[5]=37.090$ ,  $p < 0.001$ ), with a mean rank of 428.50 for conventional TV, 425.40 for smart TV, 408.06 for smartphone, 397.40 for tablet, 215.90 for laptop, and 142.00 for computer. According to one-way ANOVA test results, parents spend approximately three hours per day on conventional TV, smart TV, and smartphones, 2.0-2.3 hours on tablets, and one-two hours on computers and laptops. Adolescents screentime across the six different screen devices was also significantly different ( $X^2[5]=72.500$ ,  $p < 0.001$ ), with a mean rank of 493.26 for smartphones, 449.12 for smart TV, 435.73 for conventional TV, 334.67 for tablets, 309.77 for computers, and 197.39 for laptops. One-way ANOVA test results showed that adolescents spent three hours on their smartphones, conventional TV, and smart TV, 2.0-2.3 hours on tablets, and one-two hours on computers and laptops.

**Table 3.** Comparison between parents & adolescents screentime

Screentime	Variable	n	Mean rank	Rank sum	Z	U	p
	Parents	296	306.36	90,684.00	-1.004	42,664.00	0.315
	Adolescents	302	292.77	88,417.00			
	Parents	68	75.09	5,106.00	-.024	2,748.00	0.981
	Adolescents	81	74.93	6,069.00			
	Parents	10	11.75	117.50	-2.057	62.50	0.040*
	Adolescents	22	18.66	410.50			
	Parents	28	38.88	1,088.50	-0.040	682.50	0.968
	Adolescents	49	39.07	1,914.50			
	Parents	4	7.63	30.50	-0.396	15.50	0.692
	Adolescents	9	6.72	60.50			
	Parents	407	388.95	158,301.00	-3.683	75,273.00	0.000***
	Adolescents	431	448.35	193,240.00			

Note. Mann-Whitney U test was performed for comparison: \* $p < 0.500$ ; \*\* $p < 0.010$ ; & \*\*\* $p < 0.001$

Additionally, Mann-Whitey U test was used to test **H3**, which stated adolescents spend more screen time with each device compared to their parents. The results obtained support **H3** only for computer ( $U=62.50$ ,  $p=0.400$ ) and smartphone ( $U=75,273.00$ ,  $p < 0.001$ ) screentime comparisons but reject **H3** for other devices screentime comparisons, as shown in **Table 3**. There was no significant difference in screentime between mothers and fathers for any of the screen devices. Boys spent more smartphone screentime ( $U=19,388.00$ ,  $p=0.005$ ) than girls; there was no significant difference for screentime on other devices. These results reject **H4**, which stated that gender differences exist in screen time between parents and adolescents. **H4** is only supported for smartphones among adolescents, where boys exceed smartphone screentime. It was important to note that though the preference rate for using smartphone was higher among girls, boys spent more screen time with smartphones. Analyzing parents' and adolescents' device ownership with their respective screentime using the Mann-Whitney U test produced insignificant results for screen devices other than smartphones. Both parent ( $U=16,684.00$ ,  $p=0.007$ ) and adolescent ( $U=25,811.50$ ,  $p=0.015$ ) data proved that smartphone ownership increases screen time.

The intended usage purposes of screen devices were evaluated based on percentages and were largely the same between parents and adolescents. Screen devices are primarily utilized for a variety of purposes, such as personal use (taking notes, using a calculator, and taking pictures), work, education, entertainment, and communication. For entertainment, parents and teenagers use both conventional and smart TVs. The most common use of conventional television was for entertainment (93.9% of parents and 95.0% of adolescents in the study) followed by infotainment, mainly watching news. Smart TV use was mostly for entertainment (representing 94.1% of the parent sample and 87.7% of the adolescent population), but adolescents also showed diverse engagement in using smart TV such as education (17.3%), communication (6.2%), play (7.4%). There were differences in the ways that parents and teenagers used laptops and computers. Of the parent sample, 40.0% utilized computers for work and 50.0% for personal usage. The most common uses of computers among the sample of adolescents were for education (63.6%), gaming (22.7%) and enjoyment (40.9%), then for education. The primary purposes of laptop use of the parent sample were work (39.3%), education (42.9%), personal use (14.3%), communication (14.3%), and entertainment

(17.9%). Most of the teenage sample utilized their laptops for educational purposes (63.3%), entertainment (46.9%) and games (14.3%). While parents primarily favor tablets and smartphones for gaming, adolescents also utilize PCs, laptops, and tablets. Parents (0.9% in the total sample) utilized a tablet, and that was hardly ever for personal, educational, gaming, or communication purposes. 2.0% of the total sample of adolescents used tablets, mostly for educational purposes and gaming, then for entertainment and personal usage. For communication purposes, parents used smartphones, tablets, and laptops, but adolescents mostly used smartphones. Parents used smartphones majorly for communication (67.3%), entertainment (51.8%), personal use (39.3%), educational (31.9%), work (30.0%) and for playing games (12.0%). Adolescents used smartphones, majorly for educational (82.6%) followed by communication (54.0%), entertainment (50.8%), personal use (39.7%) and playing games (37.8%).

## DISCUSSION & CONCLUSION

The primary objective of the study was to evaluate and compare the screen media devices' usage patterns between digital immigrant parents and their digital native adolescents in India. With the huge digital divide existence between parents and adolescent-children in India, this study focused to understand the screen devices usage patterns of them.

The study findings broadly classify the screen devices into three groups based on screen time. The most used devices, smartphones, conventional TVs, and smart TVs, belong to the first group, where the most screen time is spent. Parents and adolescents still rely on traditional media and spend more time in front of conventional TVs and smart TVs, which were made for entertainment, despite the availability of multipurpose screen devices. Tablets can be classified into a second group; they are the least available, used, and owned devices, but more screen time is spent on them than on laptops and computers. Laptops and computers belong to the third group, which are primarily used for professional and educational purposes with less screen time. Some of the parental factors that are associated with adolescent screen time include parents' age, education, job nature and SES (Bernard et al., 2017; Matarma et al., 2016). This research analysis found that screen time was

more associated with the intended purpose of use and was not dependent on device availability, ownership, or screen size.

Previous research findings stated that devices used at adolescent and young formative years are highly preferred in their later stage and thus older people avoid complex user interfaces (Sackmann & Weymann, 1994). And smaller screen devices like smartphones, tablets are most used among adolescents and young people than old people (Bozzola et al., 2019; Lugtig & Toepoel, 2016). But the current study results contradict these findings as smartphones, tablets and laptops were also commonly used among parents.

The presence of screen devices and their strong engagement among parents and adolescents indicate the need for explanatory research on the psychological and physical effects of using these screen devices separately, which are usually highly concentrated only among smartphones. The lesser screen time spent with tablets, laptops, and computers, which closely possess the same capabilities as smartphones, could be encouraged as an alternative option to reduce the negative effects produced by excess smartphone usage.

During the COVID-19 pandemic, teenagers spent up to 10 hours per day watching screens (Werling et al., 2021). The outcomes of this study are consistent with current research findings that screen device usage has steadily decreased to pre-pandemic levels, which are roughly four hours each day. Boys and girls spend the same amount of time using screen devices, except for smartphones, which adolescents mostly use for communication. Stranger contacts are seen as potential threats for girls, and so parents usually regulate the girls' time spent for communication using smartphones. Adolescents spend equally or more screen time than their parents with screen devices, even though the ownership is with the parents.

The digital media usage pattern was different between first generation digital natives and second-generation digital natives (Joiner et al., 2013). As discussed in literature above, people born between 1980 to 1992 who were referred as first-generation digital natives in western countries are digital immigrants in developing countries. On that note, screen device consumption patterns are quite similar among digital immigrant-parents and digital native-adolescents in developing countries. This similar pattern between parents and adolescents indicates that parents do not feel hesitant to adapt themselves to newer challenging screen devices usage. This leads to further research on the role of screen devices in parenting practices, parent-adolescent relationship, and family communication. Though parents' equal level of engagement with screen devices to their adolescents shows the shortening of digital gap, it also notifies the crucial position of parents whose psychological association with screen media referring to excitement, addiction, unregulated media usage, is being same as their children.

Adolescents interact more frequently with digital screens and the online world because they spend more time alone after school and because of peer pressure. Children and adolescents learn from their parents on digital well-being; hence it becomes necessary for parents to regulate their screen time and be aware of the digital risks to monitor and guide their children (Tang et al., 2018).

The Indian Academy of Pediatrics strongly recommends parents' participation in their children's and adolescent's media consumption practices to ensure safety use of screen-based media (Fairclough, 2021; Gupta et al., 2022; Singh & Balhara, 2021). Parents should be informed on cyber bullying, online risks, exposure to inappropriate content and violence and spread awareness onto their children (Chen et al., 2020; Wong et al., 2020). This study suggests academic institutions organize workshops and seminars, involving media educators, psychiatrists, pediatricians, on regulated use of screen media among parents to educate them. Government schemes on providing guidelines to parents and adults in regulating the family screen media usage and broadcasting the same in mainstream media channels could increase parental awareness on digital well-being. Indian Government launched two schemes namely 'national digital literacy mission' in 2014 (was active till 2016) and 'Pradhan Mantri Gramin Digital Saksharta Abhiyan' in 2017 on educating people on digital literacy. Even though the schemes impact reflects effective in people performance in terms of basic digital literacy skills (Vishwanath Achari & Feneilce, 2020), this study suggests adding healthy digital culture approaches in the curriculum.

The variables measuring screen device usage that were investigated in this study were limited to device availability, usage, ownership, and screen time. To better comprehend the parent-adolescent media relationship, future research can explore relationships between device perception, usability knowledge, and digital skills.

**Author contributions:** **NP:** conceptualization, methodology, data collection, analysis, writing-original draft preparation, & editing & **PUM:** conceptualization, supervision, & validation. Both authors agree with the results and conclusions.

**Funding:** No external funding is received for this article.

**Ethics declaration:** The authors declared that the Institutional Review Board of the Centre for Research, Anna University gave its approval for the study procedure, which followed the Declaration of Helsinki, dated 16 September 2021 (Approval code: Lr. No. 18237197135/Ph.D./AR13). A cover letter explaining the study objectives and procedures was presented to parents, and informed consent was received from parents approving their adolescent children to participate in our study. Another written informed consent was obtained from participating students and parents regarding their voluntary participation in the study.

**Declaration of interest:** The authors declare that they have no competing interests.

**Availability of data and materials:** All data generated or analyzed during this study are available for sharing when appropriate request is directed to the corresponding author.

## REFERENCES

- Allen, M. S., & Vella, S. A. (2015). Are the correlates of sport participation similar to those of screen time? *Preventive Medicine Reports*, 2, 114-117. <https://doi.org/10.1016/j.pmedr.2015.02.002>
- Azadfallah, P., Shalani, B., & Farahani, H. (2021). Correlates of screen time in children and adolescents: A systematic review study. *Journal of Modern Rehabilitation*, 15(4), 187-208. <https://doi.org/10.18502/jmr.v15i4.7740>

- Bernard, J. Y., Padmapriya, N., Chen, B., Cai, S., Tan, K. H., Yap, F., Shek, L., Chong, Y.-S., Gluckman, P. D., Godfey, K. M., Kramer, M. S., Saw, S. M., Müller-Riemenschneider, F. (2017). Predictors of screen viewing time in young Singaporean children: The GUSTO cohort. *International Journal of Behavioral Nutrition and Physical Activity*, *14*, 112. <https://doi.org/10.1186/s12966-017-0562-3>
- Bozzola, E., Spina, G., Ruggiero, M., Vecchio, D., Caruso, C., Bozzola, M., Staiano, A. M., Agostiniani, R., Del Vecchio, A., Banderali, G., Peroni, D., Chiara, A., Memo, L., Turra, R., Corsello, G., & Villani, A. (2019). Media use during adolescence: The recommendations of the Italian Pediatric Society. *Italian Journal of Pediatrics*, *45*, 149. <https://doi.org/10.1186/s13052-019-0725-8>
- Bröhl, C., Rasche, P., Jablonski, J., Theis, S., Wille, M., & Mertens, A. (2018). Desktop PC, tablet PC, or smartphone? An analysis of use preferences in daily activities for different technology generations of a worldwide sample. In J. Zhou, & G. Salvendy (Eds.), *Human aspects of IT for the aged population: Acceptance, communication and participation* (pp. 3-20). Springer. [https://doi.org/10.1007/978-3-319-92034-4\\_1](https://doi.org/10.1007/978-3-319-92034-4_1)
- Carter, B., Rees, P., Hale, L., Bhattacharjee, D., & Paradkar, M. S. (2016). Association between portable screen-based media device access or use and sleep outcomes: A systematic review and meta-analysis. *JAMA Pediatrics*, *170*(12), 1202-1208. <https://doi.org/10.1001/jama.pediatrics.2016.2341>
- Cauberghe, V., Van Wesenbeeck, I., De Jans, S., Hudders, L., & Ponnet, K. (2020). How adolescents use social media to cope with feelings of loneliness and anxiety during COVID-19 lockdown. *Cyberpsychology, Behavior, and Social Networking*, *24*(4), 250-257. <https://doi.org/10.1089/cyber.2020.0478>
- Chen, C., Chen, S., Wen, P., & Snow, C. E. (2020). Are screen devices soothing children or soothing parents? Investigating the relationships among children's exposure to different types of screen media, parental efficacy and home literacy practices. *Computers in Human Behavior*, *112*, 106462. <https://doi.org/10.1016/j.chb.2020.106462>
- Cudo, A., Torój, M., Misiuro, T., & Griffiths, M. D. (2020). Problematic Facebook use and problematic video gaming among female and male gamers. *Cyberpsychology, Behavior, and Social Networking*, *23*(2), 126-133. <https://doi.org/10.1089/cyber.2019.0252>
- Darbha, S., & Rao, N. S. (2016). The concept of digital natives & digital immigrants in context of India. *International Journal of Managerial Studies and Research*, *4*(4), 1-5. <https://doi.org/10.20431/2349-0349.0404001>
- Dearman, D., & Pierce, J. S. (2008). It's on my other computer!: Computing with multiple devices. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 767-776). <https://doi.org/10.1145/1357054.1357177>
- Dennis, C.-L., Carsley, S., Brennenstuhl, S., Brown, H. K., Marini, F., Bell, R. C., Miller, A., Ravindran, S., D'Paiva, V., Dol, J., & Birken, C. S. (2022). Screen use and internet addiction among parents of young children: A nationwide Canadian cross-sectional survey. *PLoS ONE*, *17*(1), e0257831. <https://doi.org/10.1371/journal.pone.0257831>
- Downing, K. L., Hinkley, T., Salmon, J., Hnatiuk, J. A., & Hesketh, K. D. (2017). Do the correlates of screen time and sedentary time differ in preschool children? *BMC Public Health*, *17*(1), 285. <https://doi.org/10.1186/s12889-017-4195-x>
- Fairclough, S. J. (2021). Adolescents' digital screen time as a concern for health and well-being? Device type and context matter. *Acta Paediatrica*, *110*(7), 1985-1986. <https://doi.org/10.1111/apa.15843>
- Fong, M. W. L. (2009). Technology leapfrogging for developing countries. In M. Khosrow-Pour (Ed.), *Encyclopedia of information science and technology* (pp. 3707-3713). IGI Global. <https://doi.org/10.4018/978-1-60566-026-4.ch591>
- Griffioen, N., Scholten, H., Lichtwarck-Aschoff, A., van Rooij, M., & Granic, I. (2021). Everyone does it—Differently: A window into emerging adults' smartphone use. *Humanities and Social Sciences Communications*, *8*(1), 177. <https://doi.org/10.1057/s41599-021-00863-1>
- Gupta, P., Shah, D., Bedi, N., Galagali, P., Dalwai, S., Agrawal, S., John, J. J., Mahajan, V., Meena, P., Mittal, H. G., Narmada, S., Smilie, C., Ramanan, P. V., Evans, Y. N., Goel, S., Mehta, R., Mishra, S., Pemde, H., Basavaraja, G. V., ... IAP Guideline Committee on Digital Wellness and Screen Time in Infants, Children and Adolescents. (2022). Indian Academy of Pediatrics guidelines on screen time and digital wellness in infants, children and adolescents. *Indian Pediatrics*, *59*(3), 235-244. <https://doi.org/10.1007/s13312-022-2477-6>
- Jenkins, H. (2006). *Convergence culture: Where old and new media collide*. NYU Press.
- Joiner, R., Gavin, J., Brosnan, M., Cromby, J., Gregory, H., Guiller, J., Maras, P., & Moon, A. (2013). Comparing first and second generation digital natives' internet use, internet anxiety, and internet identification. *Cyberpsychology, Behavior, and Social Networking*, *16*(7), 549-552. <https://doi.org/10.1089/cyber.2012.0526>
- Karsay, K., Schmuck, D., Matthes, J., & Stevic, A. (2019). Longitudinal effects of excessive smartphone use on stress and loneliness: The moderating role of self-disclosure. *Cyberpsychology, Behavior, and Social Networking*, *22*(11), 706-713. <https://doi.org/10.1089/cyber.2019.0255>
- Lugtig, P., & Toepoel, V. (2016). The use of PCs, smartphones, and tablets in a probability-based panel survey: Effects on survey measurement error. *Social Science Computer Review*, *34*(1), 78-94. <https://doi.org/10.1177/0894439315574248>
- Marciano, L., Ostroumova, M., Schulz, P. J., & Camerini, A.-L. (2021). Digital media use and adolescents' mental health during the COVID-19 pandemic: A systematic review and meta-analysis. *Frontiers in Public Health*, *9*, 793868. <https://doi.org/10.3389/fpubh.2021.793868>

- Matarma, T., Koski, P., Löyttyniemi, E., & Lagström, H. (2016). The factors associated with toddlers' screen time change in the STEPS study: A two-year follow-up. *Preventive Medicine, 84*, 27-33. <https://doi.org/10.1016/j.ypmed.2015.12.014>
- Miller, V. (2020). *Understanding digital culture*. SAGE.
- Munaro, H., Silva, D., & Lopes, A. (2016). Prevalence of excessive screen time and associated factors in a school from a city in the northeast of Brazil. *Journal of Human Growth and Development, 26*, 360. <https://doi.org/10.7322/jhgd.122821>
- Nagata, J. M., Cortez, C. A., Cattle, C. J., Ganson, K. T., Iyer, P., Bibbins-Domingo, K., & Baker, F. C. (2022). Screen time use among US adolescents during the COVID-19 pandemic: Findings from the adolescent brain cognitive development (ABCD) study. *JAMA Pediatrics, 176*(1), 94-96. <https://doi.org/10.1001/jamapediatrics.2021.4334>
- Parent, J., Sanders, W., & Forehand, R. (2016). Youth screen time and behavioral health problems: The role of sleep duration and disturbances. *Journal of Developmental and Behavioral Pediatrics, 37*(4), 277-284. <https://doi.org/10.1097/DBP.0000000000000272>
- Prensky, M. (2001). Digital natives, diggital immigrants part 1. *On the Horizon, 9*(5), 1-6. <https://doi.org/10.1108/10748120110424816>
- Rather, M., & Rather, S. A. (2019). Impact of smartphones on young generation. *Library Philosophy and Practice*. <https://c4rnhk.org/impact-of-smartphones-on-young-generation/>
- Reid Chassiakos, Y. L., Radesky, J., Christakis, D., Moreno, M. A., Cross, C., & Council on Communications and Media. (2016). Children and adolescents and digital media. *Pediatrics, 138*(5), e20162593. <https://doi.org/10.1542/peds.2016-2593>
- Sackmann, R., & Weymann, A. (1994). *Die technisierung des alltags: Generationen und technische innovationen [The mechanization of everyday life: Generations and technical innovations]*. Campus-Verl.
- Saleem, S. M. (2020). Modified Kuppaswamy socioeconomic scale updated for the year 2020. *Indian Journal of Forensic and Community Medicine, 7*(1). <https://doi.org/10.18231/ijfcm.2020.001>
- Shawcroft, J., Gale, M., Coyne, S. M., Twenge, J. M., Carroll, J. S., Brad Wilcox, W., & James, S. (2022). Teens, screens and quarantine; the relationship between adolescent media use and mental health prior to and during COVID-19. *Heliyon, 8*(7), e09898. <https://doi.org/10.1016/j.heliyon.2022.e09898>
- Singh, S., & Balhara, Y. P. S. (2021). "Screen-time" for children and adolescents in COVID-19 times: Need to have the contextually informed perspective. *Indian Journal of Psychiatry, 63*(2), 192-195. [https://doi.org/10.4103/psychiatry.IndianJPsychiatry\\_646\\_20](https://doi.org/10.4103/psychiatry.IndianJPsychiatry_646_20)
- Spina, G., Bozzola, E., Ferrara, P., Zamperini, N., Marino, F., Caruso, C., Antilici, L., & Villani, A. (2021). Children and adolescent's perception of media device use consequences. *International Journal of Environmental Research and Public Health, 18*(6), 3048. <https://doi.org/10.3390/ijerph18063048>
- Stald, G., Green, L., Barbovski, M., Haddon, L., Mascheroni, G., Sagvari, B., Scifo, B., & Tsaliki, L. (2014). Online on the mobile: Internet use on smartphones and associated risks among youth in Europe. *EU Kids Online*. <http://eprints.lse.ac.uk/59960/>
- Tang, L., Darlington, G., Ma, D. W. L., & Haines, J. (2018). Mothers' and fathers' media parenting practices associated with young children's screen-time: A cross-sectional study. *BMC Obesity, 5*, 37. <https://doi.org/10.1186/s40608-018-0214-4>
- Vishwanath Achari, V. V., & Feneilce, R. (2020). *Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) and rural development in association with the poverty line and digital literacy rate*. [https://www.researchgate.net/publication/344362411\\_Pradhan\\_Mantri\\_Gramin\\_Digital\\_Saksharta\\_Abhiyan\\_PMGDISHA\\_and\\_Rural\\_Development\\_in\\_Association\\_with\\_the\\_Poverty\\_Line\\_and\\_Digital\\_Literacy\\_Rate](https://www.researchgate.net/publication/344362411_Pradhan_Mantri_Gramin_Digital_Saksharta_Abhiyan_PMGDISHA_and_Rural_Development_in_Association_with_the_Poverty_Line_and_Digital_Literacy_Rate)
- Werling, A. M., Walitza, S., Grünblatt, E., & Drechsler, R. (2021). Media use before, during and after COVID-19 lockdown according to parents in a clinically referred sample in child and adolescent psychiatry: Results of an online survey in Switzerland. *Comprehensive Psychiatry, 109*, 152260. <https://doi.org/10.1016/j.comppsy.2021.152260>
- Wong, R. S., Tung, K. T. S., Rao, N., Leung, C., Hui, A. N. N., Tso, W. W. Y., Fu, K.-W., Jiang, F., Zhao, J., & Ip, P. (2020). Parent technology use, parent-child interaction, child screen time, and child psychosocial problems among disadvantaged families. *The Journal of Pediatrics, 226*, 258-265. <https://doi.org/10.1016/j.jpeds.2020.07.006>