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## **A needs assessment study to inform development of a yoga module for safe use of digital screens among adolescents**

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**Abstract-** With the increase in time spent on screen, there are equally growing concerns that this might adversely affect psychological and social well-being. Previous studies have linked the overuse of technology leads to physical and psychological health problems among adolescents. The present study aims to understand the screen usage behavior, and health issues faced by adolescents due to excessive screen use and to know the awareness levels and opinions of students, parents, and teachers about yoga practice as a therapeutic tool to address the problems associated with increased screen use. A needs assessment survey was conducted to understand the concerns related to excessive screen usage behavior of adolescents. This survey was conducted among students, teachers, and parents. This assessment focused on the health-based need to address excessive screen usage among adolescents. A total of 3286 people participated in the current study of which 1528 were students, 923 were parents and 835 were teachers. Participants were from both rural and urban areas and included both males and females in all three groups. Although, both parents and teachers recognize the health hazards of excessive screen usage and reported that kids often spend more time on different social media and gaming platforms, they seem to be satisfied with the academic performance of their children. Moreover, students also were aware of the effect of their screen usage behavior on their health. Findings also indicate that majority of the parents were unaware of the WHO guidelines related to safe screen use. Students, parents as well as teachers feel that screen time is a significant health-related issue and yoga practice is a feasible therapeutic approach to control excessive screen time behavior.

**Key words:** Screen time, yoga, adolescent development, physical health, mental health

### **INTRODUCTION**

With the proliferation of digital devices, humans have fundamentally changed how they work, play, and socialize. The advent of high-speed Internet, flat panel displays, and mobile computing power have resulted in devices that are now shaping and defining modern childhood as we know it.<sup>1</sup> For instance, the average time spent on online has more

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than doubled from 8 hr per week in 2005 to 18.9 hr in 2015.<sup>2</sup> With the increase in time spent on screen, there are equally growing concerns that this might adversely affect psychological and social well-being.<sup>3,4</sup> Previous studies have linked the overuse of technology to physical health problems, such as sedentary behaviour, sleep disruptions, and musculoskeletal issues.<sup>5</sup> Furthermore, research points to a direct link between excessive use of technology and problems with anxiety, despair, loneliness and depression.<sup>6</sup>

Screen-based activities are used by adolescents in many different ways, including watching television, playing computer games, and using the computer for other purposes (internet, chatting, e-mailing, homework, etc.). A common feature of these activities is that they usually involve maintaining a constant position in relation to the screen, regardless of their objective. As screen-based activities increase across different media types, it is important to address both the specific as well as cumulative effects of these activities. Analysis of such data might reveal if particular activities are more risk factors for physical complaints, or if the relationship generalises and accumulates across activities. However, it is important to consider several other factors while addressing the role of screen-based activities. These factors include level of physical activity, life stress, and depressive symptoms.<sup>7</sup>

Yoga is a widely accepted lifestyle-based intervention that can address these factors effectively as it has been shown to positively impact the health of people in healthy and disease conditions. Moreover, yoga is increasingly being recognized as a complementary treatment for addiction and other psychiatric issues.<sup>8</sup> For instance, a study on Suryanamaskara shows that it activates 80 percent of the musculoskeletal system, induces peace and calmness and improves executive function, attention and concentration.<sup>9,10</sup> Another study on Bhramari pranayama showed that it can aid in activating higher limbic activities and harmonizing hypothalamic functions.<sup>11</sup> Similarly, yoga practice has been shown to have a positive influence on dysphoric moods, emotional regulation, self-esteem, self-awareness, academic performance, and executive functions.<sup>12,13</sup> Meditation is also known to cause changes in the brain's limbic lobes, influencing the expression of anger and producing calmness.<sup>14</sup> A four-year qualitative study on developing mindfulness among college students for self-care by engaging them in a 15-week program consisting of hatha yoga, meditation, qigong, and mindfulness-based stress reduction practices promoted positive results in their physical, emotional, mental, spiritual health, and interpersonal skills.<sup>15</sup>

Even though there is a wider acceptability for yoga practice due to its health benefits, it is not known whether it is equally acceptable or considerable approach among people to address the problem of increasing screentime among students. Since yoga is a lifestyle based therapeutic approach, it becomes more important to understand about the willingness or acceptability in the society to implement

such interventions effectively. Therefore, the current need-based survey study attempts to understand if people by at large consider yoga practice to be effective in addressing the growing concern of increasing screen time. The information was gathered from students, teachers and parents to get a comprehensive understanding of the problem of screen time. Along with that the present study also helps us in understanding the perspectives of parents and teachers on the benefits of yoga practice in the context of screen usage behaviours of students.

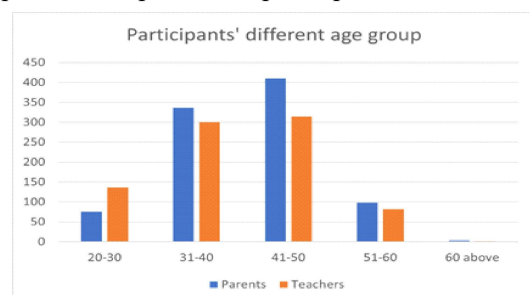
## MATERIAL & METHODS

### Study Design

A needs assessment survey to understand the concerns related to excessive screen usage behavior among students, teachers and parents. This assessment focused on the health-based needs to address excessive screen usage among adolescents. The study was approved by the institutional ethics board of S-VYASA University (IEC No. RES/IEC-SVYASA/224/2022). Written consent was obtained from participants. Informed assent was received from adolescents and informed consent was received from their parents. The study was carried out in accordance with the principles as enunciated in the Declaration of Helsinki. The current study was also registered as a clinical trial (CTRI/2022/05/042360).

### Sample Size

The required sample size was calculated based on previous work with mean screen time of 2.7 hours with standard deviation of 1.7 and primary objective to determine the mean screen time among users with 95% confidence interval and margin of error  $\pm 0.20$  units. The calculated required sample was 277.56, where value from the standard normal distribution (z) was 1.96 for 95% confidence interval (CI) with a standard deviation ( $\sigma$ ) of 1.7 that had a designed margin error of 0.20. Moreover, to account for clustering design effect of 3 was used and arrived at a final sample size of 840 (after rounding off 832.67) for each group. Total sample size of participants was 3297.



### Study Participants

The participants, in all the three groups, were from different parts of the country. Participants who were able to read and write English language were included in the study. Only currently employed teachers were considered for the survey in the teacher's group. If participants reported of any physical or psychological health conditions which interfered with their ability to take the survey were excluded from the study.

### Assessment Tools

#### Student's Survey:

The survey form of students included 31 questions including demographic information. The survey gathered information related to the health-related impact of screen usage, the kind of electronic devices used by the students, and how do they spend time on the electronic gadgets and their awareness about what constitutes excessive screen usage.

#### Parents' Survey:

The parents' survey form included 35 questions including demographic information. The survey was conducted to understand the beliefs and concerns about the needs for screen usage by their children, the impact of screen usage on their children's physical and psychological health, and their beliefs about yoga practice for reducing excessive screen usage. This survey helped in understanding the concerns of screen usage from a parent's perspective.

#### Teacher's Survey:

The teacher's survey form included 33 questions that also included the demographic information. The teacher's survey gave important insights about the teachers' opinion on online education and its impact on academic performance of students. The survey also gave understanding about the teachers' perception on the impact of excessive screen usage on physical and psychological health of students and ways of mitigating the problem of excessive screen use among them.

#### Survey/questionnaire

The questionnaire was created after a group discussion with a team of ten experts. Feedback was gathered independently, and the final version was agreed upon by consensus.

#### Procedure for implementing the needs assessment survey

The needs assessment survey was carried out both online and offline. A Google form was created to conduct

an online survey. Convenience, snow ball sampling is used for data collection. Authors reached out to different education institutes via e-mail and phone calls (e-mail address and WhatsApp numbers were gathered from different google groups and social media groups of educational institutes, teachers, and parents) to educational institutes, parents and teachers. Author explained about the study and requested to be a part of the study by providing survey response. The Google form link was shared via WhatsApp and email. Offline surveys were carried out by personally reaching out to educational institutes, teachers and parents.

#### Data Analysis/Data Extraction

The data was collected both through online and offline mode. Post survey, the data were tabulated for parents, teachers and students separately. Thereafter, a descriptive analysis of the survey was carried out using excel.

#### Inclusion and exclusion criteria:

The participants, in all three groups, who were able to read and write English language were included in the study. Only currently employed teachers were considered for the survey in the teacher's group. If participants reported any physical or psychological health conditions that interfered with their ability to take the survey were excluded from the study. All genders were included in the study. Adolescent students having the age group of 10 to 19 years have been included in the study.

## RESULTS

A total of 3286 people participated in the current study of which 923 were parents, 835 were teachers and 1528 were students. Participants were from both rural (students 296, parents 191, teachers 278) and urban (students 1232, parents 732, teacher 557) areas and included both male and female in all three groups. However, the majority of participants belonged to the urban area. Most of the people who responded in the parent and teacher group were graduates and post-graduates. Whereas the maximum students responded were between class 6 and 10, age ranged between 10 to 19 years. Demographic description of the participants is provided in Table 1 (a) & (b). The survey was conducted both online and offline and the response was received from many states in India. The maximum responses were received from the states of Gujarat (18%), Karnataka (13%) and Delhi (10%).

Table 1 (a): Demographic Information of parents and teachers

Demographic Variable	n (no. of participants)		n (%)	
	Parents	Teacher	Parents	Teachers
<b>Age (years)</b>				
20 to 30	75	137	8.11	16.41
31 to 40	336	300	36.36	35.93
41 to 50	410	314	44.37	37.6
51 to 60	98	82	10.61	9.82
Above 60	4	2	0.43	0.23
<b>Highest Education Qualification</b>				
Below High School	1	2	0.10	0.23
High School	6	0	0.64	0
Intermediate	83	42	8.98	5.02
Under-Graduate	492	293	53.24	35.08
Post-Graduate	307	484	33.22	57.96
Doctorate	34	14	3.67	1.67
<b>Residence Type</b>				
Urban	732	557	79.22	66.7
Rural	191	278	20.67	33.29

**Screen usage and online education**

The majority of parents (56.01%) and teachers (61.44%) reported that they were unaware of the WHO guidelines related to screen time usage. At the same time, both parents (45%) and teachers (92.22%) were willing to attend any orientation/workshop/awareness program relating to safe screen usage, although teachers were seen to be more willing to attend such programs (Table 2). Regarding online education of children, majority of parents (48.54%) and teachers (52.69%) feel that the online education also leads to spending more time surfing through different websites and online games.

Parents and teachers both seem to agree that the COVID-19 has increased the screen time use significantly. According to parents the increased screen time in children

Table 1 (b): Demographic information of students

Demographic Variable	n (No. of students)	n (%)
<b>Age (years)</b>		
10 to 15	931	60.53
15 to 19	597	38.81
<b>Gender</b>		
Male	873	57
Female	655	43
<b>Education</b>		
Class 3 to 5	72	4.68
Class 6 to 10	880	57.21
Intermediate (11 to 12)	576	37.45
<b>School/ College Type</b>		
Govt.	343	23
Private	1185	77
<b>Residence Type</b>		
Urban	1232	80
Rural	296	20

is majorly contributed by video games (46.8%) and social media (53%), whereas teachers contrast this opinion by saying that the majority of the screen time is spent for educational purposes (78%). However, none of the groups of teachers and parents prescribe complete cessation of online education. Specially, parents (46.91%) think that online education is also important along with the offline education. Table 2, provide details of these aspects. The students on the other hand feel that they are able to concentrate (45.7%) while studying online, although they also agree that their academic performance has gone down (49.06%). However, they reported spend more or less same time being spent on screen for education (73.14%) and other purposes (social media 67.49%, playing games 68.85%, watching videos 58.98%).

Table 2: Concerns of parents and teachers related to online education.

	Strongly Agree		Agree		Neither Agree nor Disagree		Disagree		Strongly Disagree	
	Parents (%)	Teachers (%)	Parents (%)	Teachers (%)	Parents (%)	Teachers (%)	Parents (%)	Teachers (%)	Parents (%)	Teachers (%)
Do you feel that after COVID-19, screen time has increased?	25.57	58.44	59.80	31.02	13.65	2.28	13.65	0.48	NA	NA
If increased, then for what purpose? (You may tick multiple options)										
Educational Purpose	14.63	78.44	50.92	12.22	24.92	1.08	24.92	0.24	0.54	0.24
Social media	33.37	40.00	53.85	42.04	10.29	9.46	10.29	0.72	NA	NA
Playing Games	43.12	36.77	46.80	2.87	6.72	0.24	6.72	0.12	0.22	NA
Watching Videos	45.72	36.17	46.80	3.59	6.18	0.24	6.18	NA	0.33	NA
Do you agree that your child focuses on the study while taking online classes?	15.28	31.86	41.39	18.68	30.55	19.04	11.92	20.12	0.87	2.51
Do you agree that your child requires monitoring while taking online classes?	21.67	43.83	56.34	1.44	20.15	10.90	1.84	35.93	NA	0.12
Do you agree that online learning leads to increased internet use, playing video games, social media, watching videos, etc.?	18.31	47.07	61.54	2.04	18.85	8.02	1.30	34.97	NA	0.12
Have you noticed in your child about following symptoms after online classes or excessive use of Screens? (You may tick multiple options)										
Irritation	10.4		60.67		20.8		7.48		0.65	
Backpain	26.76		54.17		12.57		5.53		0.98	
Headache	37.27		45.4		9.43		6.83		1.08	
Concerned about eyesight	42.47		42.47		9.53		5.09		0.43	
Weight gain	14.19		44.31		30.01		10.29		1.19	
Depression	6.28		41.82		35.43		15.06		1.41	
Anxiety	7.8		38.57		35.86		15.82		1.95	
Sleeping problem	13.33		38.57		33.48		12.24		2.38	

**Screen time use and health issues**

Parents and students agree that the increased use of screen has caused some health-related issues. Parents report that they have noticed some changes due to excessive screen use in several health-related issues like irritation (71.07%), eye related problems (84.94%), backpain (80.93%), depressive symptoms (48.51%), anxiety symptoms (46.37%), headache (82.67%), weight gain (58.53%), and

sleeping problems (51.9%) (Table 2). Similarly, students also reported increased problems in above mentioned health parameters viz - irritation (87.25%), backpain (87.64%), eye related problems (89.01%), depressive symptoms (84.2%), anxiety symptoms (86.08%) headache (89.4%), weight gain (86.47%), and sleeping problems (74.95%) (Table 3).

**Table 3: Online education experience of students**

	Agree (%)	Disagree (%)	Neither Agree nor Disagree (%)	Neutral (%)	Strongly Agree (%)	Strongly Disagree (%)
Are you able to concentrate on your study while taking online classes?	45.75	16.97	0.06	26.42	9.1	0.97
Do you agree that online learning gives you an advantage to use the internet, playing video games, social media, watching videos etc.?	49.67	1.10	0.06	5.78	5.39	1.10
Are you feeling such problems during or after online classes or excess use of Screen?						
Irritation	12.93	2.27	1.56	0	8.58	0
Backpain	13.26	2.01	1.62	0	8.38	0.06
Headache	13.97	1.43	1.56	0	8.38	0
Concerns about eyesight	11.83	1.56	1.69	0	10.27	0
Weight gain	13.71	2.34	1.95	0	7.28	0.06
Depression	67.23	9.03	5.59	0	17.29	0.26
Anxiety	68.14	8.45	4.68	0	17.94	0.19
Sleeping problem	11.11	2.34	1.62	0	10.20	0.06
Do you agree that your academic performance has gone down while studying through online mode?	13.45	1.04	0	6.11	3.96	0.45

Further, majority of parents (50.6%) and teachers (74.25%) think that yoga could help in preventing or mitigating the adverse effects of excessive screen use. Therefore, both parents and teachers think that the yoga

could be incorporated with educational program, outdoor games and recreational activities (Table 4). Participants are also of the opinion that the student’s online activity should be monitored along with the yoga practice.

**Table 4: Opinions of parents and teachers about the significance of yoga practices**

	Yes		No		Maybe					
	Parents (%)	Teachers (%)	Parents (%)	Teachers (%)	Parents (%)	Teachers (%)				
Do you think health related problems due to online classes or excessive screen usage can be cured with yoga?	50.6	74.25	6.61	0.48	42.8	25.27				
According to you what should be the best practices to be used for "safe use of a screen"?	Educational Program and Yoga		Monitoring Child online activity and Yoga		Outdoor game		Recreational activity	Strict instructions for minimum usage of screen time		
	Parents (%)	Teachers (%)	Parents (%)	Teachers (%)	Parents (%)	Teachers (%)	Parents (%)	Teachers (%)	Parents (%)	Teachers (%)
	18.42	23.35	39.54	8.74	21.99	3.95	14.73	1.79	4.33	2.15

**DISCUSSION**

The current study offers a cross-sectional perspective regarding excessive screen usage among students. The data was gathered from parents, teachers, and students across different states of India to understand the screen usage behavior, associated health problems, and methods to prevent or mitigate the adverse effects of increased screen usage.

**Online Education & Risk of excessive screen use**

Outcomes of the current study show that online education has resulted in complaints of irritation, back pain, headache, weight gain, and sleep problems in the students which is consistent with the findings of the previous studies.<sup>16</sup> Increased digital time has been reported to increase the risk of myopia, obesity and reduced general

health in adolescents. Increased screen time is also known to increase the odds of unhealthy dietary habits such as skipping breakfast, consuming fast food frequently and eating sweets frequently, and decrease the odds of healthy dietary habits such as consuming fruits every day, consuming fresh or cooked vegetables.<sup>17</sup> When almost every student uses technology and is regularly exposed to electronic screens, the risk of adverse effects of excessive screen use also increases.<sup>17,18</sup> Concerns related to these risks were also visible in the current study. Parents and teachers expressed that students often spend time on social media, games, videos, etc. while studying online, resulting in spending more time on screen and eventually reducing the time for outdoor activities. These distractions may eventually increase the mind wandering that has an association with academic performance and working memory. Moreover, higher levels of mind wandering are associated with lower academic performance and working memory.<sup>19</sup>

#### **Excessive screen use and psychological health**

Students in the present study reported to experience symptoms related to depression and anxiety due to excessive screen time. Parents also acknowledge of observing these symptoms in their children. The increased use of screen-based technology has been suggested to contributed to an increase in the prevalence of mental health problems and suicide among young people.<sup>20-23</sup> Similar to the current study, previous studies show that excessive screen usage might lead to a sedentary lifestyle and sleep disturbance and can increase the risk of depression and anxiety.<sup>24,25</sup> Prolonged screen time is known to hinder cognitive development, affecting attention span, memory, and problem-solving ability.<sup>26</sup> The increased screen use can also reduce the face-to-face interaction that hinders social skills development and the ability to develop meaningful relationships in students.<sup>27</sup>

#### **Excessive screen use & yoga intervention**

Although the majority of respondents for the current survey were from urban areas (80.61%, parents + teachers), they were unaware of the WHO guidelines related to the safe use of screens (parents 56.01%, teachers 61.44%). Even though excessive screen use is felt to be a top priority parent concern (parents 82.77%, teachers 92.82%), teachers (92.22%) seemed more willing than parents (45.61%) to attend any orientation/workshop/awareness program related to screen usage and yoga. In fact, majority of parents (50.6%) and teachers (74.25%) believe that the yoga

practice might actually help in addressing health-related problems of excessive screen usage. Previously, the practice of yoga has shown to benefit various psychological and psychiatric issues. For instance, practice of yoga-nidra induces positive influence on enthusiasm, alertness, quietude, clarity of thought, control over anger, self-confidence, and self-awareness.<sup>28</sup> Similarly, trauma informed yoga therapy helps improving parasympathetic tone, mitigating stress levels.<sup>29</sup> That in turn may help in promoting self-regulation that is critical in system regulation and healing mind and body, which is critical as excessive screen time may lead to less physical activity, skipping school, alcohol use and unhealthy eating habits.<sup>30</sup> Furthermore, a review on functional and anatomical changes among yoga practitioners found increased grey matter in the inferior frontal gyrus correlated with improved attention and well-being, while increased grey matter volume, enabling them to control movement, memory, and emotions. Therefore, yoga practice is a widely acceptable and feasible programs that can help increase the awareness of safe technology use and develop healthy technology use behaviours is critical prevent and mitigate the health-related problems associated with increased screen time. The strength current study highlighted perceptive accounts of parents, teachers and students themselves on their screen usage behaviours and its subsequent effects on their health. The significance of the current study is that it provides community-based evidence on the need for yoga practice to address the health problems associated with excessive screen use. Expressing the need for yoga reflects the broader acceptance of yoga as a lifestyle intervention in the community. The information gathered from the current study is critical for future studies that intend to develop yoga-based interventions for students with excessive screen use.

While the current study has several limitations and establishes the need for awareness for the safe use of technology among adolescents, it doesn't enquire into the pattern of parental practices towards the usage of screens by their adolescent children. The physiological and psychological problems indicated in the current study are subjective experiences of the students and their caregivers. However, the information could not be ascertained whether the participants were consulting with a mental health professional to address their problems of excessive screen use. This information would have helped understand the help-seeking behaviours among adolescents and their

parents with respect specific health-related problems associated with excessive screen use.

Health-related problems associated with excessive screen use are a significant concern among students, parents, and teachers, and are aware of the health issues being faced due to increased screen use. Students, parents, and teachers find yoga practice to potentially benefit in developing healthy screen use behaviour.

These findings indicate that the health-related concerns associated with excessive screen use must be addressed immediately. Educational initiatives are being implemented to raise awareness among parents, teachers, and students about digital hygiene.<sup>31</sup> Organizations like Indian Academy of Paediatrics (IAP) have also provided guidelines on screen time and digital wellness in infants, children and adolescents.<sup>32</sup> Several terms, including Nomophobia, Fear of Missing Out (FOMO), Digital Burnout, Digital Wellbeing, and Digital Fasting, are used in this context. However, merely increasing awareness is insufficient to address the issues arising from excessive screen usage. One effective strategy to mitigate health problems associated with prolonged screen time is needed and the practice of yoga intervention can be a significant initiative among adolescent students.

Parents and teachers in the current study think that yoga can be one of the effective strategies to deal with the adverse effects of excessive screen use. Therefore, it can be considered to be included as a part of the lifestyle of adolescents in different ways. Previous studies have shown that yoga helps reduce stress, anxiety, depressive symptoms, negative thoughts, back pain, obesity, and sleep-related problems. Therefore, it seems that the effectiveness of yoga therapy in managing various health issues has gained confidence in the minds of parents or caretakers and teachers that they are expressing their interest in including yoga practice in the lifestyle of adolescents as an effective strategy to prevent or mitigate the excessive screen usage and related health problems. Promoting mindful screen time through yoga explores how integrating yoga interventions encourages adolescents to approach screen time with mindfulness, fostering awareness and balance in their digital habits. Mitigating health risks associated with screen time examines how yoga interventions can help alleviate the negative health effects of excessive screen time, such as eye strain, sedentary behavior, and disrupted sleep patterns. Enhancing adolescent well-being with yoga, highlight the role of yoga in enhancing overall well-being

among adolescents, encompassing mental health, stress management, and emotional resilience in the digital age. Empowering adolescents with coping strategies showcases how yoga interventions equip adolescents with effective coping strategies to navigate challenges associated with screen time, fostering a positive relationship with technology. Taking a Holistic approach to adolescent health, illustrates the holistic benefits of integrating yoga interventions into screen time practices, addressing both physical and mental aspects of adolescent health and well-being. Educating stakeholders on digital hygiene, advocating for integrating yoga-based digital hygiene programs in educational settings, and providing adolescents, parents, and educators with tools to safely navigate screen time. Future directions in research and practice, highlight the need for further research and implementation of evidence-based yoga interventions to optimize screen time habits and support adolescent health in today's digital world.

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#### CONFLICTS OF INTEREST

There are no conflicts of interest.

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