

**Indian Academy of Pediatrics Guidelines on Screen Time and Digital Wellness in Infants, Children and Adolescents**

PIYUSH GUPTA,<sup>1</sup> DHEERAJ SHAH,<sup>1</sup> NIDHI BEDI,<sup>2</sup> PREETI GALAGALI,<sup>3</sup> SAMIR DALWAI,<sup>4</sup> SANWAR AGRAWAL,<sup>5</sup> JJO JOSEPH JOHN,<sup>6</sup> VIDUSHI MAHAJAN,<sup>7</sup> PINKY MEENA,<sup>1</sup> HEMA G MITTAL,<sup>8</sup> S NARMADA,<sup>9</sup> CHABUNGBAM SMILIE,<sup>10</sup> PADMASANI VENKAT RAMANAN,<sup>11</sup> YOLANDA N EVANS,<sup>12</sup> SANJEEV GOEL,<sup>13</sup> RAJESH MEHTA,<sup>14</sup> SUDHIR MISHRA,<sup>15</sup> HARISH PEMDE,<sup>16</sup> GV BASAVARAJA,<sup>17</sup> BAKUL J PAREKH,<sup>17</sup> MICHAEL RICH,<sup>18</sup> FOR THE \*IAP GUIDELINE COMMITTEE ON DIGITAL WELLNESS AND SCREEN TIME IN INFANTS, CHILDREN, AND ADOLESCENTS.

*Department of Pediatrics, <sup>1</sup>University College of Medical Sciences and GTB Hospital, Dilshad Garden, Delhi; <sup>2</sup>SGT Medical College Hospital and Research Institute, Gurugram, Haryana; <sup>3</sup>Bengaluru Adolescent Care and Counselling Centre, Bengaluru; <sup>4</sup>New Horizons Child Development Centre, Mumbai, Maharashtra; <sup>5</sup>Ekta Institute of Child Health, Raipur; <sup>6</sup>Believers Church Medical College Hospital, Thiruvalla, Kerala; <sup>7</sup>Government Medical College Chandigarh; <sup>8</sup>ABVIMS and Dr RML Hospital, New Delhi; <sup>9</sup>Nalam Medical Centre and Hospital, Sathuvachari, Vellore; <sup>10</sup>Regional Institute of Medical Sciences, Imphal, Manipur; <sup>11</sup>Sri Ramachandra Institute of Higher Education and Research, Chennai, Tamil Nadu; <sup>12</sup>University of Washington Seattle Campus: University of Washington, USA; <sup>13</sup>Computer and Medical Informatics Chapter of IAP, Vadodara; <sup>14</sup>World Health Organization Regional Office for South-East Asia, Delhi; <sup>15</sup>Tata Main Hospital, Jamshedpur; <sup>16</sup>Lady Hardinge Medical College, New Delhi; <sup>17</sup>Indian Academy of Pediatrics, Mumbai, Maharashtra; <sup>18</sup>Harvard Medical School, Boston, Massachusetts, USA.*

*Correspondence to: Dr Dheeraj Shah, Director-Professor, Department of Pediatrics, University College of Medical Sciences and GTB Hospital, Dilshad Garden, Delhi 110 095. shahdheeraj@hotmail.com*

**PII: S097475591600384**

**Note:** This early-online version of the article is an unedited manuscript that has been accepted for publication. It has been posted to the website for making it available to readers, ahead of its publication in print. This version will undergo copy-editing, typesetting, and proofreading, before final publication; and the text may undergo minor changes in the final version.

**ABSTRACT**

**Justification:** Screen-based media have become an important part of human lifestyle. In view of their easy availability and increasing use in Indian children, and their excessive use being linked to physical, developmental and emotional problems, there is a need to develop guidelines related to ensure digital wellness and regulate screen time in infants, children, and adolescents. **Objectives:** To review the evidence related to effects of screen-based media and excessive screen time on children's health; and to formulate recommendations for limiting screen time and ensuring digital wellness in Indian infants, children and adolescents. **Process:** An Expert Committee constituted by the Indian Academy of Pediatrics (IAP), consisting of various stakeholders in private and public sector, reviewed the literature and existing guidelines. A detailed review document was circulated to the members, and the National consultative meet was held online on 26th March 2021 for a day-long deliberation on framing the guidelines. The consensus review and recommendations formulated by the Group were circulated to the participants and the guidelines were finalized. **Conclusions:** Very early exposure to screen-based media and excessive screen time (>1-2h/d) seems to be widely prevalent in Indian children. The Group recommends that children below 2 years age should not be exposed to any type of screen, whereas exposure should be limited to a maximum of one hour of supervised screen time per day for children 24-59 months age, and less than two hours per day for children 5-10 years age. Screen time must not replace other activities such as outdoor physical activities, sleep, family and peer interaction, studies and skill development, which are necessary for overall health and development of the children and adolescents. Families should ensure a warm, nurturing, supportive, fun filled and secure environment at home, and monitor their children's screen use to ensure that the content being watched is educational, age-appropriate and non-violent. Families, schools and pediatricians should be educated regarding the importance of recording screen exposure and digital wellness as a part of routine child health assessment, and detect any signs of cyberbullying or media addiction; and tackle it timely with expert consultation if needed.

**Keywords:** *Cyberbullying, Digital technology, Harmful effects, Management, Media addiction, Prevention, Screen-based media.*

Screen time and digital technology have become an inevitable part of childhood, with shift of learning and socialization to virtual environments [1]. However, concerns on ill-effects of excessive exposure to screen and digital media have emerged. Several professional organizations and World Health Organization (WHO) have issued recommendations on digital wellness and screen-time for children [1-6]. As the scope of digital awareness and content may differ according to cultural and socio-demographic background, guidelines need to be developed in regional context.

**PROCESS**

In August 2020, the Executive Board of the Indian Academy of Pediatrics (IAP) constituted a task force to formulate guidelines and recommendations on screen time and digital wellness in children. (*Annexure 1: List*

of participants). Nine sub-committees were constituted to conduct detailed search of literature and prepare narrative review of evidence on the following topics: (i) Definitions and types of digital media; (ii) Extent of problem of digital media/screen-time use by children; (iii) Importance of digital media; Harmful effects of screen-time on (iv) health, (v) development and psychology, and (vi) child safety and security; (vii) Effective interventions to address screen time and digital wellness; (viii) Family and societal perceptions; and (ix) Existing guidelines and legislation related to use of digital media and screen-time.

These sub-committees prepared the first draft of their respective reviews by December 2020. These were then internally discussed and refined on e-mail with small group meetings of the sub-committees. The second draft was prepared, based on all inputs, and re-circulated to all members. A National Consultative meeting was held on 26 March 2021 on digital platform (Zoom) where all the reviews were discussed, and the deliberations among experts provided the direction to frame the draft of recommendations. The final document was prepared by the Writing Committee after several rounds of revisions and was approved by the IAP Executive Board.

### **EXTENT OF PROBLEM**

Screen exposure is reported as early as in infancy in almost all countries. The nomenclature used for defining screen time and types of media is summarized in **Box 1** [7-13]. Among under five children, excess screen time prevalence varies from 10% to 93.7% across the high-income countries, and 21% to 98% in the middle-income countries [14]. However, there is inhomogeneity in criteria used to define excess screen time, varying from more than one hour in some studies [15-17] to more than two hours in others [18,19]. Overall screen time ranged from 0.9 to 3.5 hours/day among under five children; 1.0 to 3.1 hours/day among school-aged children; and 1.3 to 7.1 hours/day among adolescents across different studies.

#### **Western literature**

Earlier studies done on screen time reported television as the most preferred and commonly watched screen over other digital-media devices [20,21]. The American Academy of Pediatrics (AAP) statement on media use in school-aged children and adolescents, reported average daily TV time over 2 hours per day in children above 8 years of age. Approximately three-fourths of teenagers owned a smart-phone and 25 percent of teenagers were found to be “constantly connected” to the Internet. Social media sites, mainly Facebook, Twitter, and Instagram were being used by 75% of teenagers. Approximately 80% households owned a device used to play video games, boys being the most avid video game players [1,2].

#### **Indian Scenario**

Indian studies demonstrate shows a similar trend as western world with initial exposure to screen-based media as early as 2 months of age; and median age of first exposure to screen at 10 months. Most children are exposed to screen-based media by 18 months of age; with greater usage of smartphones (96%) than television viewing (89%). Nearly 65% families keep their television on while having dinner [22]. In another Indian study (2019), four out of five preschool children reported using smartphone devices, primarily for games and videos [23].

In a study among Indian adolescents, three-fourth (76.4%) of them viewed television during mealtime, and only 22.9% had family rules for watching television. Screen time for the vacation and holidays

was more than school days (3.9 (2.8) and 3.2 (2.8) hours/ day respectively). Most used devices were television (96.5%) and mobile phones (56.7%) [24]. A systematic review of Indian studies depicted smartphone addiction among adolescents, ranged from 39% to 44%. [25].

### **Factors affecting screen-time**

Many studies have observed and assessed different factors associated with increased or decreased screen time in children. Various systematic reviews have identified more than 30 correlates across various age groups [26,27]. Factors influencing screen time can be related to children (age of introduction of screen device, duration of sleep, sedentary preferences, eating in front of screen, fast food consumption); parents and caregivers (parental screen-time and perceptions, working hours, education); and demographics and environment (easier access to digital media, high background television time, number of screen devices at home, socioeconomic status, working of parents from home, lockdown).

### **HARMFUL EFFECTS OF SCREEN TIME**

Parents, pediatricians, and policymakers need to be cognizant of the harmful effects of screen use in children. Television exposure is the most studied electronic media; mobile dependence, internet access, gaming addiction, and social media addiction are some of the other areas of concern.

#### **Obesity**

Various longitudinal cohort studies and randomized controlled trials (RCTs) have demonstrated a cause and effect relationship between screen media use and obesity [28]. Watching television for more than 2 hours per day has been shown to cause obesity among preschool children as well [29]. Food advertisement is an important link connecting media time with unhealthy food consumption and subsequent obesity [30]. Other proposed mechanisms of screen exposure and obesity include decreased physical activity, increased intake of high-calorie, low-energy food, and decreased sleep [31]. Sleep deprivation leads to changes in ghrelin and leptin, causing increased hunger and decreased satiety. Short sleep duration leads to increased snacking and eating outside of normal mealtimes, especially at night thereby leading to consumption of more unhealthy calories [31].

#### **Sleep Disturbance**

Blue light emitted by electronic media suppresses and disrupts melatonin secretion. Use of light emitting media prior to sleep is associated with decreased subjective sleepiness and suppressed late evening rise of pineal melatonin [32]. Violent or sexual content portrayed in the media can cause excitement, fear or stress in children, leading to delayed onset of sleep. Violent daytime media exposure has also been associated with sleep problems, nightmares and night awakenings, again affecting sleep quality adversely [33]. Social media use and internet surfing was seen to cause maximum sleep onset latency and mid-sleep awakenings [34]. Use of media as sleeping aids was found to be associated with higher fatigue, later time to bed, lesser hours of sleep per week and poorer sleep quality [32-34].

#### **Postural effects and Visual Disturbances**

Most children using a cell phone or laptop tend to have poor posture, with head tilted forward and shoulders

stooping forward to look at the screen. This can lead to increased stress around the cervical spine with early wear and tear, and degeneration. According to the American Optometric Association, *Computer Vision Syndrome* is a complex of eye and vision problems, experienced during or related to computer work. Refractive errors, astigmatism and ocular discomfort are some of the commonest eye problems. Reduced blink rate and amplitude have been consistently reported with screen use, leading to headaches [35].

### **Cognitive Development**

Exposure to adult-directed television content early in life, as well as high background television exposure has negative association with the child's executive functioning and cognitive development [36]. Background television has been shown to impair the quality and quantity of parent-child interaction and disrupt sustained toy play in this age group [37]. A systematic review concluded that children with excess screen time are at a higher risk of delayed language development, learning problems (language and mathematics), and reading problems [28]. Children older than 6 years are more likely to watch adult-directed media, which can influence anti-social and aggressive behavior, due to exposure to violent content. Changes in aggression can be long-lasting and shape the child's personality. Adolescents who are exposed to violent video games reported increased hostility, physical fights and poorer school performance [38].

### **Body Image Perception and Emotional Disorders**

Negative social comparisons (e.g. getting fewer 'likes' on a social media picture) can lead to worsening body image perceptions and harmful psychological impacts in a vulnerable mind [39]. Early exposure to television at age 1 and 3 years has been associated with attention problems at age of 7 years [40]. Systematic reviews and meta-analysis have demonstrated small but significant associations between social media use and depressive symptoms [41-43].

### **Drug and Substance Abuse**

Exposure to media violence may result in subsequent aggressive behavior and ideas, anger, and arousal [44]. Exposure to smoking in movies is identified as a risk factor for taking up smoking among children [45]. Viewing alcohol advertisements is found to increase immediate alcohol consumption relative to non-alcohol advertisements [46]. Cyberbullying can have strong psychological impact, and seems more strongly linked with substance abuse and depression as compared to traditional bullying [47]. Sexting is receiving, sending, or forwarding sexually explicit messages or photographs. Teen sexting can lead to unhealthy sexual practices, and perpetration of sexual harassment. It has also been linked to negative outcomes such as depression and low self-esteem [48].

## **BENEFICIAL EFFECTS OF SCREEN MEDIA**

### **Learning and Social Interaction**

For children above 2 years of age, shared use of media between children and parents may help enhance learning interactions. Adolescents find social media useful to develop and nurture friendships [49]. Digital media can promote healthy behaviors and counter undesired effects among children and adolescents [50]. Social marketing campaigns are effective means to promote behavior change, like prevention and control of substance abuse, encouraging physical activities, maintaining healthy diet and prevention of sexually

transmitted diseases [51]. According to a systematic review, tailored audio or text messages on cell phones can enable adolescents improve their health-related knowledge, increase compliance to medications and disease monitoring, setting reminders for regular appointments [52].

### **Other Benefits**

Children and adolescents can experience positive emotions and learn moral values through digital media. Digital technologies (watching TV, playing videogames, using computers and smartphones) when used in moderation (2 to 4 hours/day) may promote psychological and emotional well-being. Preschoolers and early elementary school graders can identify and feel basic emotions like happiness, sadness, anger, and fear portrayed in digital media. Playing on computer-based games may have additional benefits of enhancing abstract thinking, analyzing information and improve planning, problem-solving skills, scientific reasoning, artistic and creative skills of children and adolescents [53,54].

### **EFFECTIVE INTERVENTIONS**

Interventions have been conducted in the community, school, home/family, and clinics. Mode of intervention varied from providing knowledge, aiming at behavioral change, environmental, or regulatory interventions, or their combinations. Most of the interventions were based on behavior change theories. Most studies were from western world; Indian data is meager. The most effective interventions included those which specifically targeted and set goals for reduced TV viewing or screen-media use, used electronic monitoring devices, contingent feedback systems or clinic-based counseling, had high levels of parental involvement, and/or recruited participants who were already overweight or obese at baseline, had restricted access to the television or computer, or by providing opportunities for physical activity [55,56]. Another systematic review [57] included 21 studies in children between 3 to 11 years. 'TV turnoff week' strategy was documented beneficial to reduce screen time. A recent review of 17 studies [58] suggested that the most effective factors resulting in effective reduction in screen time included long duration of intervention ( $\geq 6$  months); and conduct in a community-based or preschool/childcare setting.

### **EXISTING GUIDELINES: GLOBAL AND INDIAN SCENARIO**

#### **Global Guidelines**

Guidelines and recommendation on screen time have been advocated by various professional societies as well as by World Health Organization [1-6]. Guidelines on screen time were issued by American Academy of Pediatrics (AAP) in 2001 [59] and further modified in 2013 and 2016 so as involve all age groups, from infancy to adolescents [1,2]. Canadian Paediatric Society released similar guidelines in 2017, which were updated in 2019 for older children and adolescents [60]. In 2019, WHO, in its global action plan on ending childhood obesity and physical activity, advocated no sedentary screen time for 1-year-olds and screen exposure of less than 1 hour/day in 2-5 years old; lesser the better [61].

#### **Indian Guidelines**

Indian Psychiatry Association in 2020-2021 issued recommendations for media use in children and adolescents up to 18 years of age [62]. These guidelines advised zero screen time in children <2 years.

Between 2 to 5 years viewing for specific purposes like educational games or teaching aid for a limited period (not longer than 30 minutes per session, and not more than two sessions per day, under supervision - a shared media use), rather than for entertainment was advocated. Adult interaction with the child during media use was stressed upon.

During COVID pandemic when screen time became a necessity for online education, PRAGYATA guidelines were issued by the Ministry of Information and Broadcasting in association with National Council for Education, Research and Training (NCERT). Pre-primary children should not be made to sit in front of screens for over 30 minutes while children of Classes I to 8 limit online classes to 2 sessions (30-45 min duration each) and 4 sessions (30-45 min duration each) for classes 9-12 [63].

Indian Academy of Pediatrics (IAP) released its parental guidelines for screen time in 2021 which cautioned about the harms of excess screen time and also provided guidelines to parents on the permissible screen viewing time, digital hygiene, healthy use and the right age for use of various platforms of social media. [64].

## **IAP GUIDELINES AND RECOMMENDATIONS**

Based on the review of evidence and existing guidelines from other agencies, and the deliberations during, before and after the meeting, the group arrived at the following consensus guidelines:

### **A. Guidelines for Children and Families**

#### *1. Infants and children 0-23 months age*

- Children below 2 years age should not be exposed to any type of screen.
- Screen media (e.g., smartphones, tablets, television) should not be used to facilitate feeding.
- Screen media should not be considered as an easy option to calm a crying/distressed child.
- Families should avoid incidental exposure of child to screen media by not leaving the devices on and should avoid watching the screen while engaging with the child, or with the child in the same room.
- Parents should look out for and prevent screen exposure in their absence, e.g. when the child is being looked after by a domestic help or in a crèche or daycare center.
- Parents should involve child in physical play activities, storytelling, music, and movement (dance), and age-appropriate toys to promote early childhood development.
- Minimal and occasional screen time may be allowed for social interaction with close family members staying at distant places.

#### *2. Children 24-59 months age*

- Limit screen time to a maximum of 1 hour (per day with each session not more than 20-30 min); the lesser, the better.
- Use only one screen at a time. Do not start a habit of media multitasking.
- Screen time needs to be always supervised by the caregivers. Promote shared use of screen media between child and families to ensure interaction and quality exposure.
- Caregivers should ensure that the content being watched is educational, age-appropriate, non-violent, healthy, and preferably interactive.

- Do not use screen media during meals, within one hour before sleep, or during surface travel.
- Children should have at least 3 hours of physical activities of any intensity (including at least one hour of physical activity of moderate-to-vigorous intensity), and 10–14 hours of good quality sleep daily (younger the child, more the sleep duration).

### 3. *Children 5-10 years age*

- Limit screen time to less than 2 hours per day; the lesser, the better. This includes recreational screen time, and time spent on screen at home to complete educational and extra-curricular assignments.
- Screen media exposure should be mainly for the purpose of education, learning, and social interaction. Recreational screen time should be kept to a minimal.
- Parents should monitor when children are using screens for education so that children are not straying away from lessons to play games, view online content, or communicate with others online.
- Screens should not be used to overcome boredom. Boredom is an emotion, and should be celebrated and encouraged as the cauldron of imagination and creativity.
- The device used by child should belong to one of the parents, and child should not get an independent phone/tablet/laptop. Modify the home environment by restricting access to the television or computer using a digital control device.
- Co-view and monitor use of digital media by children to ensure appropriateness of content, and children's safety and security.
- Encourage and reward appropriate use of screens. Discuss with them strategies and reasons to reduce screen time. Teach children to record their own screen time and ask them to inform parents and adults in the family, immediately, about any inappropriate or disturbing material/ messages viewed online. Do not permit the use of social media by the child except to catch up with educational, sports and extra-curricular assignments. Children and young adolescents are not mentally ready to handle social platforms such as Facebook, Twitter, WhatsApp, Instagram etc.
- Screen time must not replace study time, play time, sleep time, family time or 'me' time. Children of this age should have 9-12 hours of sleep, and at least one hour per day of physical activity of moderate-to-vigorous intensity.

### 4. *Adolescents (10-18 years age)*

- Balance screen time with other activities that are required for overall development. These activities include at least one hour of outdoor physical activity (playtime), 8-9 hours of nighttime sleep, and time for schoolwork, meals, hobbies, peer interaction and family time. If any of the above activities is compromised due to screen time, then screen time needs to be appropriately reduced to accommodate the same.
- Educate adolescents about safe and healthy use of screen devices. Most of the screen time should be related to education, communication, skill development and promoting healthy lifestyle and safety.
- Monitor media use by adolescents and ensure that they are not using/downloading any violent or undesirable content. Discuss the content with them and use this opportunity to instill media literacy

(promote critical thinking to interpret media messages), values, healthy and safe lifestyle, and knowledge of cyberlaws and strategies to detect fake news and messages.

- Monitor social media use by adolescents to ensure data privacy, cybersecurity, and detect any signs of cyberbullying or media addiction. Most apps and media are linked to email account, especially the offensive or adult content. All the content can be monitored and seen by checking what a child is doing by monitoring the email.
- Ensure that screen use is not interfering with their academic performance, mental health, talent development, and acquisition of values. If it is, regulate the screen use appropriately. If that does not work, consult the pediatrician for guidance.
- Parents should update themselves regarding new technology so that they could effectively monitor the media use by adolescents and can detect any inappropriate activity. They should have passwords and ability to access all online accounts at any time to protect and teach youngsters about their digital footprint.
- Before allowing adolescents to use a social media platform/video game, parents should familiarize themselves with it and allow only if they think it is appropriate for age.
- Parents should act as a role model to promote digital wellness in the whole family. They need to limit their screen time and be a role model for children and adolescents.

#### 5. *Guidelines for healthy use of media*

Parents should talk to children regarding healthy use of media before permitting them to use gadgets and make them responsible digital citizens. They must formulate clear rules about the online content that is apps, social media sites and games that they are allowed to access.

Children feel secure and are able to self-regulate better when boundaries and rules are laid down for behavior. Parents should formulate 'digital rules' to encourage healthy media usage when their child begins to use a digital device. These should be age appropriate and new rules could be added as the child becomes older. This needs to be monitored and reviewed with the child regularly. A few more rules for maintaining 'digital hygiene' are:

- Ensure a warm, nurturing, supportive, fun filled and secure environment at home. Children follow rules if they are guided in a respectful and empathetic manner.
- Screens should be switched off 1 hour before bedtime as blue light emitted from devices suppresses melatonin secretion necessary for healthy sleep.
- Adopt the correct posture while sitting in front of the computer and the mobile phone [64]. To reduce eye strain and dryness of eyes, it is important to follow 20-20-20 rule (see screen for 20 min, take a break for 20 sec, and look at an object 20 feet away).
- Avoid multitasking. While doing offline homework, all screen devices should be switched off.
- Avoid programs and games with violent content. Ensure proper privacy settings on the computer, safe search engines on browsers and apps, and anti-virus software, but do not depend on them as children can easily hack around them. For young children, install protective software to restrict access to inappropriate websites.

- Use ‘teachable moments’ on the media to convey family values, healthy lifestyle and interpret media messages. For example, irresponsible sexual behavior leading to unwanted pregnancy can be talked about while or immediately after co-viewing serials showing casual sexual encounters between teens.
- Mark digital free zones like bedroom, dining table, kitchen, bathroom, and motorized vehicles where no family member uses a gadget.
- Decide upon a digital fasting time when no family member uses any device and utilizes
- that time for family bonding. The schedule for such digital fasting (short daily breaks or/and longer weekend breaks) can be decided through mutual convenience of family members.

Parents should role model healthy media use, formulate a family media usage plan and teach online etiquette.

These are listed in **Box 2**.

### **B. Guidelines for Pediatricians**

- Screen media should not be used to distract the child to facilitate examination and procedures.
- During routine well child and adolescent visits and immunization visits, pediatricians should ask/observe the parents and adolescents about their screen exposure practices and impart anticipatory guidance to follow age-appropriate digital wellness guidelines.
- Provide written/printed material to families for appropriate use of screens and promote digital wellness. Display IEC material (preferably non-screen) in the clinics to educate families about digital wellness.
- Encourage non-judgmental communication with parents, children, and adolescents. Involve them in decision making regarding how best to reduce screentime and mitigate ill effects of unhealthy media usage that may be already occurring in the children and/or families.
- Involve both parents during educational/counseling sessions while discussing the strategies to reduce screen time for their children.
- Children above the age of 5 years and adolescents should be interviewed in private and with confidentiality regarding details of screen usage, duration, frequency, and content of programs viewed and its effects on their activities of daily living and development. They should be screened for cyberbullying, online sexual harassment and media addiction. They should be motivated to follow healthy media usage.
- All children failing the maximum permitted limits of viewing screens should be followed up subsequently during next visit or telephonically. Those detected with media addiction should be referred to a mental health professional.
- Educate other community members about impact of screen media on child’s health and development and promote digital wellness and role modeling in the society.

### **C. Guidelines for Schools**

- Ensure that screen-based devices (e.g., smartboards, LED screens) are not the only tools used for teaching-learning activities. Use a mix of conventional instructional media (e.g. chalk and board, whiteboard, flipcharts) and digital tools for education. Do not promote screen-based devices as the primary or best mode of teaching-learning.

- Ensure that online educational content, only supplements and does not replace the routine teaching-learning and physical activities in the schools, except during disasters and calamities when school attendance is not possible. In case online education is the only option, schools should follow PRAGYATA guidelines issued by Department of School Education and Literacy, Ministry of Human Resource Development, Government of India ([https://www.education.gov.in/sites/upload\\_files/mhrd/files/pragyata-guidelines\\_0.pdf](https://www.education.gov.in/sites/upload_files/mhrd/files/pragyata-guidelines_0.pdf)).
- Minimize assignments, homework, and evaluations that need use of screen, especially for children up to 10 years of age. Avoid screens wherever possible.
- Actively build an environment and have a school policy for limiting the importance and use of digital screens. Educate children about digital wellness by conducting exhibitions, competitions, and debates. Educate children using pictures and stories of families that model healthy media usage.
- Educate parents about digital wellness and cyber safety during interaction with parents.
- Do not allow children to bring/carry digital devices to school.
- Do not allow school activities to be posted on mass social media, like making pages for picnics or other school activities.
- Teachers should not be allowed to use phones during the class and should not be expected to read or respond to emails during school hours.

#### **D. Role of Indian Academy of Pediatrics (IAP)**

- Indian Academy of Pediatrics should ensure promotion of and dissemination of these guidelines to children, adolescents, schools, pediatricians and community through IEC material, campaigns, conference deliberations and workshops.
- The Academy should advocate and appeal to the government for including digital literacy and wellness issues in the school curriculum and ensure provision of services and help for avoiding and mitigating safety and security issues associated with use of internet.
- Children, parents, and public should be advocated about using the media to promote learning, skill development, social communication, health and wellness. They should also be educated about the associated ill health effects of the excessive use of screen-based digital media.
- Encourage member pediatricians to hold meetings, discussions with each other as well as other stakeholders like parents, teachers, and leaders in the community. Members should report and point out offensive and misleading content and advertisements to the concerned authorities.
- Encourage families and schools to develop and follow screen policy.
- Promote research related to screen use and family perceptions in different settings.

*Funding:* None; *Competing interest:* None stated. RM is a staff member of the World Health Organization. The author alone is responsible for the views expressed in this article and they do not necessarily represent the decisions, policy or views of the World Health Organization.

## REFERENCES

1. American Academy of Pediatrics. AAP Council on Communications. Media: Children, adolescents, and the media. *Pediatrics*. 2013;132:958-61.
2. Reid Chassiakos YL, Radesky J, Christakis D, et al. AAP Council on Communications and Media. Children and Adolescents and Digital Media. *Pediatrics*. 2016;138:e20162593.
3. Ashton JJ, Beattie RM. Screen time in children and adolescents: is there evidence to guide parents and policy? *Lancet Child Adolesc Health*. 2019;3:292-94.
4. Department for Digital Culture Media and Sport. Policy Paper UK Digital Strategy. Department for Digital Culture, Media and Sport. UK Government, London, UK; 2017. Accessed November 2, 2021. Available at <https://www.gov.uk/government/publications/uk-digital-strateg>
5. Tremblay MS, Chaput JP, Adamo KB, et al. Canadian 24-Hour Movement Guidelines for the Early Years (0-4 years): An Integration of Physical Activity, Sedentary Behavior, and Sleep. *BMC Public Health*. 2017;17:874.
6. World Health Organization. Guidelines on Physical Activity, Sedentary Behavior and Sleep for Children under 5 Years of Age. World Health Organization 2019. Accessed November 10, 2021. Available from: <https://apps.who.int/iris/handle/10665/311664>
7. Owens J. The adolescent sleep working group, committee on adolescence. Insufficient sleep in adolescents and young adults: An update on causes and consequences. *Pediatrics*. 2014;134:e921-32.
8. Minges KE, Owen N, Salmon J, et al. Reducing youth screen time: qualitative metasynthesis of findings on barriers and facilitators. *Health Psychol*. 2015;34:381-97.
9. Community Preventive Services Task Force. Reducing Children's recreational sedentary screen time: Recommendation of the Community preventive services task force. *Am J Prev Med*. 2016;50:416-18.
10. Rideout V. Measuring time spent with media: The commonsense census of media use by US 8- to 18-year-olds. *Journal of Children and Media*. 2016;10:138-44.
11. Digital wellbeing for you, your colleagues and students Briefing paper for practitioners. Accessed November 12, 2021. Available from: [https://www.digitalcapability.jisc.ac.uk/documents/228/JB0019A\\_DIGITAL\\_WELLBENG\\_PRACTITIONERS\\_BRIEFING\\_PAPER\\_NOV19\\_WEB\\_v2.pdf](https://www.digitalcapability.jisc.ac.uk/documents/228/JB0019A_DIGITAL_WELLBENG_PRACTITIONERS_BRIEFING_PAPER_NOV19_WEB_v2.pdf).
12. Christensson, P. (2006). Media Definition. Accessed November 10, 2021. Available from: <https://techterms.com/definition/media>.
13. What is digital media? All you need to know about this booming industry. Accessed October 15, 2021. Available from: <https://online.maryville.edu/blog/what-is-digital-media/>
14. Lin LY, Cherng RJ, Chen YJ, et al. Effects of television exposure on developmental skills among young children. *Infant Behav Dev*. 2015;38:20-6.
15. Christakis DA, Garrison MM. Preschool-aged children's television viewing in child care settings. *Pediatrics*. 2009;124:1627-32.
16. Byeon H, Hong S. Relationship between television viewing and language delay in toddlers: Evidence from a Korea National cross-sectional survey. *PLoS One*. 2015;10:e0120663.

17. Lee ST, Wong JE, Ong WW, et al. Physical activity pattern of Malaysian preschoolers: environment, barriers, and motivators for active play. *Asia Pac J Public Health*. 2016;28:21S-34S.
18. Kourlaba G, Kondaki K, Liargkovinos T, et al. Factors associated with television viewing time in toddlers and preschoolers in Greece: the GENESIS study. *J Public Health (Oxf)*. 2009;31:222-30.
19. Downing KL, Hinkley T, Salmon J, et al. Do the correlates of screen time and sedentary time differ in preschool children? *BMC Public Health*. 2017;17:285.
20. Emond JA, Tantum LK, Gilbert-Diamond D, et al. Household chaos and screen media use among preschool-aged children: A cross-sectional study. *Medical and Health Sciences 1117 Public Health and Health Services*. *BMC Public Health*. 2018;18:1210.
21. Jago R, Stamatakis E, Gama A, et al. Parent and child screen-viewing time and home media environment. *Am J Prev Med*. 2012;43:150-8.
22. Meena P, Gupta P, Shah D. Screen time in Indian children by 15-18 months of age. *Indian Pediatr*. 2020;57:1033-6.
23. Shah R, Fahey N, Soni A, et al. Screen time usage among preschoolers aged 2-6 in rural Western India: A cross-sectional study. *J Fam Med Prim Care*. 2019;8:1999-2002.
24. Dubey M, Nongkynrih B, Gupta S, et al. Screen-based media use and screen time assessment among adolescents residing in an Urban Resettlement Colony in New Delhi, India. *J Fam Med Prim Care*. 2018;7:1236-42.
25. Davey S, Davey A. Assessment of smartphone addiction in Indian adolescents: A mixed method study by systematic-review and meta-analysis approach. *Int J Prev Med*. 2014;5:1500-11.
26. Paudel S, Jancey J, Subedi N, et al. Correlates of mobile screen media use among children aged 0-8: A systematic review. *BMJ Open*. 2017;7:e014585.
27. Duch H, Fisher EM, Ensari I, Harrington A. Screen time use in children under 3 years old: a systematic review of correlates. *Int J Behav Nutr Phys Act*. 2013;10:102.
28. Li C, Cheng G, Sha T, et al. The relationships between screen use and health indicators among Infants, Toddlers, and Preschoolers: A meta-analysis and systematic review. *Int J Environ Res Public Health*. 2020;17:7324.
29. Suglia SF, Duarte CS, Chambers EC, et al. Social and behavioral risk factors for obesity in early childhood. *J Dev Behav Pediatr JDBP*. 2013;34:549-56.
30. Qutteina Y, Backer CD, Smits T. Media food marketing and eating outcomes among pre-adolescents and adolescents: A systematic review and meta-analysis. *Obes Rev*. 2019;20:1708-19.
31. Robinson TN, Banda JA, Hale, et al. Screen media exposure and obesity in children and adolescents. *Pediatrics*. 2017;140:S97-101.
32. Harrison K, Cantor J. Tales from the screen: Enduring fright reactions to scary media. *Media Psychol*. 1999;1:97-116.
33. Garrison MM, Liekweg K, Christakis DA. Media use and child sleep: The impact of content, timing, and environment. *Pediatrics*. 2011;128:29-35.

34. Hisler G, Twenge JM, Krizan Z. Associations between screen time and short sleep duration among adolescents varies by media type: Evidence from a cohort study. *Sleep Med.* 2020;66:92-102.
35. Computer vision syndrome. Accessed November 5, 2021. Available from: <https://www.aoa.org/healthy-eyes/eye-and-vision-conditions/computer-vision-syndrome?sso=y>
36. Barr R, Lauricella A, Zack E, et al. Infant and early childhood exposure to adult-directed and child-directed television programming. *Merrill-Palmer Quarterly.* 2010;56:21-48.
37. Schmidt ME, Pempek TA, Kirkorian HL, et al. The effects of background television on the toy play behavior of very young children. *Child Dev.* 2008;79:1137-51.
38. Gentile DA, Lynch PJ, Linder JR, et al. The effects of violent video game habits on adolescent hostility, aggressive behaviors, and school performance. *J Adolesc.* 2004;27:5-22.
39. Perloff RM. Social media effects on young women's body image concerns: Theoretical perspectives and an agenda for research. *Sex Roles.* 2014;71:363-77.
40. Christakis DA, Zimmerman FJ, DiGiuseppe DL, et al. Early television exposure and subsequent attentional problems in children. *Pediatrics.* 2004;113:708-13.
41. McCrae N, Gettings S, Pursell E. Social media and depressive symptoms in childhood and adolescence: A systematic review. *Adolescent Res Rev.* 2017;2:315-30.
42. Best P, Manktelow R, Taylor B. Online communication, social media and adolescent wellbeing: A systematic narrative review. *Children and Youth Services Review.* 2014;41:270-36.
43. Marino C, Gini G, Vieno A, et al. The associations between problematic Facebook use, psychological distress and well-being among adolescents and young adults: A systematic review and meta-analysis. *J Affect Disord.* 2018;226:274-81.
44. Ray M, Jat KR. Effect of electronic media on children. *Indian Pediatrics.* 2010;47:561-8.
45. Kulkarni MM, Kamath VG, Kamath A. et al. Exposure to tobacco imagery in popular films and the risk of ever smoking among children in southern India. *Tob Control.* 2021;30:560-66.
46. Stautz K, Brown KG, King SE, et al. Immediate effects of alcohol marketing communications and media portrayals on consumption and cognition: a systematic review and meta-analysis of experimental studies. *BMC Public Health.* 2016;16:465.
47. Gámez-Guadix M, Orue I, Smith PK, et al. Longitudinal and reciprocal relations of cyberbullying with depression, substance use, and problematic internet use among adolescents. *J Adolesc Health.* 2013;53:446-52.
48. Dake JA, Price JH, Maziarz L. Prevalence and correlates of sexting behavior in adolescents. *American Journal of Sexuality Education.* 2012;7:1-15.
49. Lenhart A, Duggan M, Perrin A, et al. Teens, social media and technology overview 2015. Smartphones facilitate shifts in communication landscape for teens. Washington, DC: Pew Internet and American Life Project; 2015.
50. Holla RG, Gupta A. Media responsibility and child health. *Indian Pediatr.* 2007;44:708.
51. O'Keeffe GS, Clarke-Pearson K. The impact of social media on children, adolescents, and families. *Pediatrics.* 2011;127:800-4.

52. Krishna S, Boren SA, Balas EA. Healthcare via cell phones: a systematic review. *Telemed J E Health*. 2009;15:231-40.
53. Dorr A. Television and affective development and functioning: Maybe this decade. *J Broadcast*. 1981;25:335-45.
54. Granic I, Lobel A, Engels RCME. The benefits of playing video games. *Am Psychol*. 2014;69:66-78.
55. Schmidt ME, Haines J, O'Brien A, et al. Systematic review of effective strategies for reducing screen time among young children. *Obesity (Silver Spring)*. 2012;20:1338-54.
56. Maniccia DM, Davison KK, Marshall SJ, et al. A meta-analysis of interventions that target children's screen time for reduction. *Pediatrics*. 2011;128:e193-210.
57. Altenburg TM, Kist-van Holthe, J, Chinapaw MJM. Effectiveness of intervention strategies exclusively targeting reductions in children's sedentary time: A systematic review of the literature. *Int J Behav Nutr Phys Act*. 2016;13:65.
58. Nguyen P, Le LK, Nguyen D, et al. The effectiveness of sedentary behaviour interventions on sitting time and screen time in children and adults: an umbrella review of systematic reviews. *Int J Behav Nutr Phys Act*. 2020;17:117.
59. American Academy of Pediatrics. American Academy of Pediatrics: Children, adolescents, and television. *Pediatrics*. 2001;107:423-26.
60. Canadian Paediatric Society. Digital Health Task Force. Digital media: Promoting healthy screen use in school-aged children and adolescents. *Paediatr Child Health*. 2019;24:402-17.
61. World Health Organization. Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age: summary. World Health Organization, 2019. Accessed November 10, 2021. Available from: <https://apps.who.int/iris/handle/10665/325147>
62. Indian Psychiatry Society. Recommendations for Screen Use: Indian Psychiatry Society 2020. Accessed November 12, 2021. Available from: <https://indianpsychiatricsociety.org/wp-content/uploads/2020/06/E-Booklet-RECOMMENDATIONS-FOR-SCREEN-USE.pdf>.
63. PRAGYATA: guidelines for digital education. Department of School Education and Literacy. Ministry of Human Resource Development Government of India 2021. Accessed November 10, 2021. Available from: [https://ncert.nic.in/pdf/announcement/PRAGYATAGuidelines English.pdf](https://ncert.nic.in/pdf/announcement/PRAGYATAGuidelines%20English.pdf).
64. Indian Academy of Pediatrics. Screen time guidelines for parents. Indian Academy of Pediatrics 2021. Accessed November 1, 2021. Available from: <https://iapindia.org/pdf/Screentime-Guidelines-for-Parents-Ch-005.pdf>

**Annexure 1:**

IAP Guideline Committee on Digital Wellness and Screen time in Infants, Children, and Adolescents

*Chairpersons:* Bakul Parekh, Piyush Gupta; *Convener:* Dheeraj Shah; *Co-conveners:* G V Basavaraja, Purna Kurkure, Harish Pemde; *National Coordinators:* Samir Dalwai, Preeti Galagali; *Members:* Nigam Prakash Narain, Anand Vasudev, G Sudhakar, Shekhar Dabhadkar, Ananda Kesavan, Raj Kumar Gupta, Sanjeev Goel, Atanu Bhadra, Geeta Patil, Sudhir Mishra, Prashant Jadhav, Remesh Kumar; *Members (Literature search and review team):* Padmasani Venkat Ramanan, Nidhi Bedi, Sanwar Agrawal, Jijo Joseph John, S Narmada, Vidushi Mahajan, Pinky Meena, Chabungbam Smilie, Hema G Mittal; *Invited Experts:* Manoj Sharma (Clinical psychologist), V C Mehta (Ophthalmologist), Rajesh Mehta (WHO-SEARO), Deepti Agrawal (WHO-INDIA), Gopal Krishnan (Media Expert), Afridah Rehman Ali (Media personality—TV Anchor); *International media experts:* Michael Rich, Yolanda N Evans

**Box 1: Definitions of common terms used in digital media**

*Screen time/digital engagement time:* Total time spent in watching screens like computers, laptops, tablets, smartphones, television, and handheld video games in a day [7-10].

*Digital wellbeing/wellness:* Maintaining health of the individual user and the community, in all spheres while using digital media and tools for personal, professional, educational, or recreational purposes. It includes safe and responsible behavior and conduct in digital environments, so as not to harm any living ones or the environment [11].

*Media:* It refers to different types of mass communication for example print, broadcast, and internet media [12]. These can be divided into traditional (print and broadcast) and newer media.

*Digital media:* These are defined as a group of media or applications that operate with the use of encoded numeric data formats and allow the creation and exchange of user generated content [13]. It includes blogs, social networking sites, collaborative projects, virtual game worlds, apps, and virtual social worlds. Smart-phones, computers, laptops, and tablets are the devices used to access the digital media [1,2].

**Box 2: Online Etiquette and Safety***Children and Adolescents*

- Follow the golden rule of interpersonal relationships; treat others as you want yourself to be treated. Never post hurtful messages. Disagree politely
- Use the right language for communication. Avoid the use of swear words. Do not use all caps while typing as it implies that you are screaming
- Do not post private information like home address, passwords, personal photograph, and family and school details.
- Respect the copyright laws and do not download or copy without permission
- Think before you type, post, and share to check if it is true, kind and legal. Before posting a picture, discuss with a parent. Do not post inappropriate material. Anything posted online cannot be erased completely as it leaves a digital footprint.
- Never meet a digital friend in person alone whom you have never met before
- Make internet a safe place by reporting online misbehavior to trustworthy adults
- During online schooling, maintain the decorum of the class, wear proper attire and follow the instructions of the teachers

*Parents*

- Teach, monitor and role-model good online manners as above.
- Whenever an incident of cyberbullying or online misbehavior is detected
  - Reassure your child that you love him/her and will help
  - Ask the child to take a break from the online world
  - Block the sender
  - Do not respond to the hurtful message
  - Save the message to enable reporting
  - If you know the bully, try talking to the parents
  - Contact the schoolteacher to inquire about bullying in school. Most schools have antibullying policies
  - Try contacting the digital platform provider to block and report the bully. If bullying doesn't stop, report to the cyber police\*

\*Cyberbullying, sexting and online sexual solicitation are cybercrimes and can be reported at cybercrime portal of Government of India (<https://www.cybercrime.gov.in>).