

On-line education and media use in adolescents: Clinical perspectives related to the COVID pandemic.

Preeti Galagali^{1*}, Nimrat S Sidhu², Chitra Dinakar³

¹Department of Pediatrics, FIAP Consultant Adolescent health specialist and pediatrician, Director of Adolescent Care and Counselling Centre, Bangalore, India

²Department of Pediatrics, Senior Resident AIMS Mohali, Punjab, India

³Department of Pediatrics, St Johns Medical College Hospital, Bangalore, India

Abstract

Background: Adolescents form an important backbone of our society, contributing to 20% of the population and reflecting the future adult population. In times of COVID when education took a backseat due to lockdown and physical restrictions, online education became a means to provide continued education and bridge the gap. Social media has been in vogue for decades now and has evolved to encompass many networking sites such as google, youtube, facebook, instagram and so on. These sites provide adolescents with a means to connect, share, create content and evolve as digital citizens. There is however a blurring of lines between required online presences for study related activities and overuse of social media/other media. There is also a lack of clarity on how much is too much when discussing online presence. Persistent and unchecked online usage by the adolescent could lead them to an unreal world, making them face negative comments and unrealistic expectations with potential severe impact on their physical and mental well-being. Compromise on sleep due to long hours spent online, body image issues like body shaming, compromised social contact with their parents and limited physical activities have been major points of concern. We review the topic of online education and media use by adolescents and provide tips to physicians to inform their practice as we come to accept that technology will continue to be the path to take, for adolescent learning and interactions, going forward.

Conclusion: Social media and online education can be a useful tool by providing a means to learning, discovering, acquiring skills, social engagement and fostering a sense of belonging. It also brings to the table a serious risk for physical and mental wellbeing. Some common problems include overweight/obesity, depression, suicide, body image issues, cyber bullying and trolling. There has to be a middle path between the issues of concern and the positive effects as 92% of the teens are known to use the internet regularly. The medical concerns can be combatted with adolescent and parent education on healthy media use, positive parental behavior related to media use, open and nonjudgmental environment facilitating effective communication and policy initiatives aimed at addressing the social, environmental and economic factors that underpin healthy lifestyles and family well-being.

Keywords: Online education, Social media, Adolescents, Mental health, Harmful effects, Public awareness, Impact on adolescent health.

Introduction

Adolescence is a significant period of biological, psychological and social change for young people as they have emergent needs, develop new skills, fulfill new responsibilities and foster their intimate relationships. India is home to 253 million adolescents, constituting 20% of the population [1]. Covid-19 besides causing paradigm shifts in their daily routines lead to the discovery of online education and enhanced media usage because of the lockdown. This has had a tremendous impact

on the evolving physical, mental, emotional and social health of adolescents.

Technology has proliferated in society and allowed us to connect faster and easier, breaking all geographical barriers. According to Lenhart 2, in 2015, 92% of teens aged 13-17 years reported going online daily; 24% of all teens reported going online almost constantly. Technology use is not only limited to the regular school work of uploading and downloading assignments but also involves apps and social media such as

*Correspondence to: Preeti Galagali, FIAP Consultant Adolescent health specialist and pediatrician, Director, Adolescent Care and Counselling Centre, Bangalore, E-mail: drpgalagali@gmail.com

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Facebook, Instagram, Snapchat, Twitter, Google, YouTube, Facebook, etc., with adolescents logging in frequently [2].

Media use has both positive and negative effects. The continuation of education, acquiring new skills, reaching out to many peers, creating content and displaying creativity are some of the positive and beneficial effects which can enhance confidence, build self-esteem and add to their knowledge acquisition. Online education has undoubtedly helped in the continuation of educational activities through COVID times, keeping adolescents up to date with their curriculum. However, policymakers and parents have expressed their concerns about the risks that adolescents are exposed to due to unlimited usage of media [3]. Some of the notable risks are, being exposed to inappropriate content for their age, such as online pornography, abusive behavior in the form of sexually provocative comments, violations of privacy, emotional burden of peer to peer statements on social media, cyber bullying and trolling. Adolescents are particularly susceptible to these risks, some of them with long term and serious consequences like social and cognitive disturbances, phone and media addiction and eyesight disorders [4].

COVID and online education

While countries are at different points in their COVID-19 infection rates, worldwide there are currently more than 1.2 billion children in 186 different countries affected by school closures that happened in the pandemic. The sudden shift from classrooms to computers in many parts of the globe has raised questions about whether the adoption of online learning will persist post-pandemic. Apart from schools providing virtual classes, online learning platforms offered free access to their services: BYJU'S a Bangalore-based educational technology, Future learn Edx, Khan Academy etc. These helped to pick up pieces from where we left off in terms of education. It helped students to learn at their own pace, skip or accelerate through lessons and even helped tap into their potentials and hobbies of learning music, art, cooking or creating content sitting miles away.

What it means for future learning

Successful transitions to online education have already been taking place amongst many universities like Zhejiang University in China offering 5000 courses online by an app called "DingTalk ZJU" and The Imperial College, London, famously known to start a course on the science of coronavirus in 2020 on "Coursera". Online courses have changed the way and reach of teaching. They enable teachers to reach out to students more efficiently and effectively through chat groups, video meetings, voting and easier form of group

communication and also document sharing. These ways of learning and teaching came to the forefront especially during this pandemic. In a recent study done by Bersin, students were found to retain 25-60% more material when learning online compared to only 8-10% in a classroom. This is due to students being able to learn faster online [5].

What it means for the future is simply that knowledge through online education disseminates knowledge across borders, companies and all parts of society. If online learning technology can play a role here, it is incumbent upon all of us to explore its full potential [5].

How has social media impacted the adolescents?

Adolescence is a complex phase of growth where major biological, physical and social characteristics evolve and refine as the individual dons a unique identity and gradually takes on more responsibility. During this period, the need to 'fit in' leads young people to allow peers to influence their choices from meals to clothes and other health impacting habits.

Social media as a boon

Social media provides an extension to what's happening in the real world. Social media and online education has become a means to research and share information online, showcase issues and opinions, stay up to date with school events, socialize and develop real world skills such as managing online presence and team collaboration [6]. According to Erik Erikson's Stages of Development during adolescence, teens face psychological discomfort as they go through 'identity crises'. Social media provides an anonymous platform to test different identities. It also aids to promote 'seeking behavior' which helps them to discover their identity [7]. Evidence also exists in support of an opposing theory, 'the stimulation hypotheses, where social media enhances the user's existing social resources through increased contact and maintenance of relationships. However evidence suggests this leads to only bridging the relationships and not bonding [8]. Though usage of online content for online education and social media provides for a huge platform for learning, forming an identity, reaching out to a larger population and staying connected during imposed isolation related to the pandemic, the benefits get diluted with excessive use such as during the times of COVID.

Social media as a bane

Internet use, mainly the social media, can be a forum for anonymity for the adolescents. It offers more options than can be pursued, given practical restrictions and limited time.

Table 1. Indian Academy of Pediatrics (IAP) gives Guideline Recommendations on Time Allotment for Screen-based Remote Learning [27], shown below in the table.

Standard/class	Pre-primary	1-2	3-5	6-8	9-10	11-12
Screen time per session(min/d)	30	30	30	30 - 45	30 - 45	30 - 45
Maximum sessions/d	1	2	2	3	4	4
Days/wk	3	3	5	5	5	6
Content						
Curricular	-	< 25%-	25%	50%	75%	75%
Co-curricular/general	100%	> 75%	75%	50%	25%	25%

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On the downside, users are under the undue influence of third parties like advertising agencies and expose themselves to risk of negative comments, cyber bullying, trolling or anti-social behavior [5]. To ensure safety against such risks there is a need for media literacy and adopting responsible digital citizenship strategies.

Media overuse can impact all developmental domains-gross and fine motor, language and social milestones. O'Reilly, et al. [9,10]. Demonstrates that more than 18% of children in elementary school (6-11 years old) exhibit the highest prevalence and risk of obesity and overweight. Obesity and overweight during the teenage years have negative and dangerous ramifications for premature mortality and morbidity as well as physical disability later in adulthood. The association between obesity/overweight and eating habits while using the internet leading to reduced physical activity was demonstrated by Ghobadi, et al. [11]. This study from Iran, states how children remain engrossed on their phones and tablets and have reduced time for physical exercises which is a risk factor for obesity.

Not only does the physical health get affected but the mental health and social well-being of an adolescent is impaired because of excessive usage of social media. Internet use was seemingly linked to a reduction in face-to-face contact, increased social isolation, stress, depression and sleep deprivation [12]. Adolescents who used social media more, both overall in the morning and at night and those who were found emotionally invested in social media, experienced poorer sleep quality, lower self-esteem and higher levels of anxiety and depression [12]. Terms such as Fear Of Missing Out (FOMO) on social media, mean the apprehension that online content and interactions from others are unseen and not reacted to. This can become problematic and lead to anxiety, interrupted sleep, lack of concentration and dependence on social media to generate gratification [10]. It makes the adolescent feel pressured to access the site frequently due to the fear of missing out. Constant social comparison to other network members also triggers jealousy, anxiety and other negative emotions including low self-esteem.

Mental health is greatly impacted by the nature of social media interactions, which are at a fingertip away, making both types of commenting-negative and positive, easy and more frequent than in-person interactions. Two of the most serious adverse effects are: social media addiction and suicidal tendencies. According to a study [13] Social media platforms have been deliberately designed in a highly sophisticated way using algorithms, making use of behavioral psychology,

neuroscience and artificial intelligence, which promotes behavioral reinforcement to increased usage and leads to addiction. This is the reason why a person cannot put down their phone. Adolescents are the earliest adopters and heaviest users especially of social media. As a result of the widespread mobile phone and wireless Internet access the problem of overuse is compounded exponentially [14].

Insomnia has also been associated with usage of social media use as studied by Chang, et al. [15]. The use of electronic screens before bedtime disrupts sleep as it takes a longer time to fall asleep, decreased evening sleepiness, reduced melatonin secretion, circadian clock delay, reduced and delay in rapid eye movement sleep and hence reduced next-morning alertness. This affects concentration and causes poor performance in academics [16].

Youth violence, including bullying, gang violence and self-directed violence, increasingly occurs in the online space. Some forms of online violence are limited to Internet-based interactions; others are directly related to face-to-face acts of violence [16]. Meta-analyses of the unhealthy effects of media-violence have shown that youth who view media-violence on a regular basis are more likely to exhibit antisocial behavior, ranging from imitative violent behavior with toys to criminal violence, acceptance of violent behavior, increased feelings of hostility and desensitization toward violent behavior [17]. Bullying and online abuse goes unreported most of the time.

The effect of social media, as studied by Lewis et al., is different based on gender. Since girls spend more time on social media, their chances of facing cyber bullying was increased and in boys, cognitive styles like those that involve rumination and brooding appeared to be exacerbated. These effects were especially risky for vulnerable young people who experience mental health difficulties, as suggested by the bidirectional relationship between use of electronic media and decrease in psychological well-being [18].

81% adolescent's worldwide report that they use social media and 67% report using it once a day [19]. To address a problem of this scale and to impact young people positively, Health Care Providers (HCP) first need to recognize and understand the virtual landscape to ensure the validity and reliability of information available and improve their own knowledge and awareness of patients' health impacting behaviors in order to engage this traditionally difficult-to-reach and often high-risk population.

Problematic Internet Use (PIU)

Using internet has become a part of our lives, and internet addiction is a serious matter of concern. Though currently

Table 2. Researchers and game users have formulated guidelines for permissible age for usage of various apps, as shown in the table below [27].

Social Media App	Minimum Permissible Age
Facebook, twitter, instagram, Google plus, snapchat	13 years
Whatsapp	16 years
Youtube	18 years *13-18 years require parental permission
PUBG	18 years For 13-18 years : restrict play time Less than 13 years: need parental permission
Clash of clans	13 years

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no definition has been accepted with consensus, there is a suggestion to include Internet addiction as a subset of addiction disorders such as substance abuse. Addiction disorders are seen more commonly in those who have depression and ADHD. Internet addiction too can lead to compulsiveness, aggression, reduced human interaction and sleep disorders. A suggested definition of Internet Addiction Disorder (IAD), put forward pending consensus is: persistent and recurrent use of internet causing clinically significant impairment or distress as indicated by five or more of the following:

- Preoccupation with internet
- Tolerance
- Unsuccessful attempts to control or stop internet use
- Withdrawal: restless/moody/depressed or irritable when attempting to cut down or stop internet use
- Uses it as a way to escape from problems
- Lies to family members/therapist regarding the time spent on internet
- Continued excessive use of internet despite knowledge of psychosocial problems
- Jeopardizes social relationship /education

IAD can be mild, moderate or severe depending on degree of disruption of normal activities.

Recently, DSM 5 and ICD-11 have included Internet Gaming Disorder (IGD), which has been classified as a mental disorder. This disorder involves compulsive gaming addiction and has clearly spelt out diagnostic criteria.

How can physicians prevent negative health impacts and inform their practice?

Clinicians form an important backbone for the behavioral modifications in an adolescent. Though this topic has not been vastly studied in India and detailed detrimental effects have still not been explored, clinicians may choose to advocate for a harm reduction approach. The suggested reduced use of social media rather than abstinence for youth is important as evidence suggests prolonged use is associated with poorer mental health. An effective method is to be non-judgmental, unbiased and encourage an open communication which fosters trust and ensures safety and confidentiality to the adolescent [20].

Counselling and educating parents

Parents should be the first ones to expose their children to the cyber world, teach cyber ethics about negative commenting and safety aspects like not putting out personal details, pictures, phone number, address and bank details.

Encouraging parents to be proactive so that they can limit the exposure to social media, exception allowed only for online classes [21]. Parents need to be role models by demonstrating responsible media use. It is more important to understand that the adolescent is always watching parents even when they appear to be not listening to them. Parents can ensure a positive digital footprint by ensuring adolescents' use the 5Ps-profile (use your first name), permission (to view), protect (evidence protection), privacy (passwords and personal details) and positive (content sharing) [22].

Tracking softwares come handy to monitor the internet exposure eg. Mob Safety, Ranger Browser, Famigo, Video Monster, Qustodio, ContentWatch, Net Nanny, etc.

Table 3. To inform the practice.

<p>Pediatricians should ensure good HEEADDSSS history.</p> <p>Important part of the questions to be addressed about the WHICH, WHO, HOW and WHAT history for social media exposure are [28-31]:</p> <p>Counseling parents:</p>	<p>Universal media history taking as component of psychosocial history - HEEADDSSS (Home & Environment, Education & Employment, Eating & Exercise, Activities (with special focus on media usage : Which media, how much, with whom and for what), Drugs/Substances , Depression, Suicide, Sexuality, Safety)</p> <p>A) Television and Mobile screen : Time spent watching , whether with or without family member , do they discuss about the shows , is there a TV installed in bedroom , are the rules set for watching TV, any demands or change of behavior after watching advertisements</p> <p>B) Movies / Videos: discuss the type of movies or videos being watched, whether any restrictions, nightmares or trouble after watching them.</p> <p>C) Music : talk about the type of music, discuss the kind of lyrics that parents may object to</p> <p>D) Video games: are the parents familiar with types of video games played? Before a child starts playing always check on the rating and advisory content, what are the time restrictions</p> <p>E) Internet Access : explain about best use of the internet , whether they are aware of different websites , ensure internet restrictions for pornographic web sites</p> <p>F) Books : in todays' age of the net it is important to enquire about the time spent reading books, discuss about the books they read, ensure a 'one book one month' rule and reading a chapter before sleeping to ensure good sleep hygiene.</p> <p>G) Use of tobacco or alcohol: are important aspects of taking history as these habits can stem from social media, peer pressure and must be addressed with focused strategies.</p> <p>Inform parents about the 20-20-20 rule: every 20 minutes, take a break for 20 seconds and look for an object 20 feet away.</p> <p>About the red flag signs of media addiction: fall in academic performance, loss of friendships, persistent and compulsive usage. In presence of such signs it is imperative to consult a pediatrician.</p> <p>It is important to check for signs of cyber bullying and online sexual harassment.</p> <p>Body image issues should be treated with grave concern as they can give rise to greater problems like obesity, depression, suicidal thoughts. It requires a positive parental influence and a supportive school environment [22].</p>
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Table 4. Some helpful tips to parents which could enable monitoring internet use, reduce distractions and help adolescents to benefit from technology are.

Digital apps / Procedures	Advantages
Apps that show the time spent online	Helps to monitor time spent on each apps
Restricted social media apps	Restricts time spent online and prevent access to social media sites after fixed time usage.
Use silent mode	Can be used during academic work to prevent any distraction
Turn off notifications	Reduces eagerness to check apps and increases concentration towards the work
Curating digital timelines	Follow teen friendly apps
Privacy settings	To monitor who may be able to see the posts
Hiding	Keeping their phones or tablets out of their sight can reduce diversions
Use a watch	Sets time for app usage Limits the digital exposure
Set expectations	To discuss with family about the teen not always being available to reply frequently to questions could improve trust
Turn off devices before bedtime	For a sound sleep, no screen time 60 mins before bed time

American Academy of Paediatrics (AAP) encourages parents to model active parenting by establishing a family home plan for all media. In the plan, a negotiated agreement for mealtime and bedtime ‘curfew’ for media devices including cell phones can be included. The plan should establish reasonable but firm rules about cell phones, texting, Internet and social media use for all family members including the adolescent. Limit the use of electronic devices besides online classes to 1-2 hours per day. AAP recommends no electronic devices such as TVs or tablets in the adolescents’ rooms and to stop usage of all gadgets 30-60 minutes before bedtime. [23] Media usage plan involves simple recommendations like: media free locations like bedrooms or media free meal times along with positive parenting activities like reading, talking and playing together.

Parents need to set routines which promote adolescents to get the recommended amount of daily physical activity (1 hour) and adequate sleep (8-12 hours, depending on age [24,25].

Be a ‘digital neighbor’ to your kids, to get a clearer understanding on what they’re doing online and getting to know some of the sites or social media apps that they’re using. While in school, community-based programs can institute limits on social media and smartphone use but these should be developmentally appropriate and aim to respectfully ensure adolescents’ autonomy (Table 1) [26].

All values denote maximum recommended upper limits; presence of parents/adult supervisor is mandatory for pre-primary and those up to 2nd grade; preferable for grade 3-5; and optional for older children; use a judicious mix of synchronous/asynchronous modes of learning; interactive learning is to be preferred.

IAP remote guidelines speak about ergonomics while using the online modes:

- a) Keep the top of the screen at eye level
- b) Chair should support your thighs
- c) Legs should be bent in 90-110 degree angle
- d) Feet should be flat on the floor
- e) Shoulders should be relaxed
- f) Forearms should be parallel to the floor
- g) Chairs should have a backrest (Tables 2 to 4)

CONCLUSION

In today’s time, where adolescents have not seen a world without the internet and social media, we need to act like prohibitionists and regulate media use. Online education and the use of social media networking sites have led to media literacy, civic engagement, defining self-identity, a sense of belonging and a means for education and acquiring new skills. But it has some serious downside effects of compromising family time and affecting both physical and mental health. Some of the negative effects are due to body image concerns, risk for obesity, trolling, cyber bullying and serious mental health disorders like depression and suicide. To make the youth benefit from smartphones and internet use, we need to navigate the media space in such a way that all the benefits remain and the potential harms could be prevented, including safeguarding mental health. Adolescents are the future of this nation and we as pediatricians have a responsibility and opportunity of shaping their future, by providing them the right kind of health and behavioral guidance. We need to partner with parents and policy makers in addition to teenagers themselves to optimize safe and beneficial media usage.

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