18 Digital Media Use in Transitional-Age Youth: Challenges and Opportunities

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Key Points

- Today's TAY are distinct from other generations in their habitual engagement with new media technology, decreased risk-taking, and increased rates of depression and anxiety.
- New digital media for entertainment and communication is extensively interwoven into TAY's lives.
- Interactions with digital technologies can engender or exacerbate mental health problems.
- Mental health disorders often drive excessive digital media use, creating a novel symptom profile.
- Mental health providers must assess digital media use, identifying elements of potential risk and harm.
- TAY often engage in social connections online in place of healthier face-to-face interactions.
- Online activities are often preferred by TAY to other means of managing negative affective states.
- TAY engaging excessively in online entertainment often experience worsening symptoms of ADHD, anxiety, or depression.
- Negative and unhealthy sites, such as those endorsing eating-disordered behaviors, self-harm, or suicide, may be particularly appealing to depressed youth.
- Solutions to common media-related problems can include mindful use and utilizing technology applications to track and limit unhealthy use.
- Incorporating new technologies into treatment can augment interventions, improve communication and alliance, and integrate treatment into our patients' lives.

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Clinical Vignette

Jared is a 19-year-old man who presents reluctantly with his parents to an initial outpatient psychiatry evaluation in relation to a suicidal threat he made after an argument with his parents over completing chores. He dropped out of college 3 months before presentation and has become progressively isolated and despondent. In high school, during which he played video games in moderation, Jared was a fair student, and he did well in his first semester of college. However, after the winter break of college, he returned to campus, bringing his powerful "gaming computer." At a friend's advice, Jared started playing Counter-Strike: Global Offensive (CS:GO) – an online competitive first-person shooter game played in teams. In his second semester, his gaming habit quickly consumed over 8 hours per day, to the detriment of sleep, socialization, homework, and study. Ultimately, Jared stopped attending class in college. He experienced a major depressive episode, lost weight, and contemplated suicide. He dropped out, returned home, and made a plan with his mother to get a full-time job. In the ensuing months, he continued to spend most of his waking hours playing CS:GO. He has not pursued a job, has gained 20 lbs., and has left household chores undone. He reports increasing social anxiety, rarely leaves home, and relapsed into depression. On interview, he makes little eye contact and gives minimal answers. His gaze returns regularly to his phone, and when asked why, he states it is to see if a CS:GO teammate has yet responded to his text. Jared admits that this has been the worst year of his life, but notes that he has at least gotten joy from playing CS:GO, which he calls "my coping skill."

Introduction

Tech is everywhere. Modern youth's engagement with media represents, by many measures, the greatest generational divide in history. Today's transitional age youth represent the first generation whose adolescence began in a world of smartphones and contemporary computers, windows to online entertainment and video games. Dubbed "iGen" [130], this cohort born between 1995 and 2012 is defined by their technology habits. Technology has had a transformative effect on how these youth experience the world on a daily basis. This poses new challenges to their health and maturation, with implications for the assessment and treatment of psychiatric disorders. Transitional age youth of today often possess new skill sets, but also lack abilities considered basic in previous generations. Disorders of mental health in youth are interwoven with the media habits and experiences which dominate their lives. Excessive online habits can themselves become pathological, causing dysfunction, representing a distinct mental disorder. Online activities and experiences such as cyberbullying, sexting, and fear of missing out (FOMO) can also have a dramatic impact on mental health. It is vital that mental health practitioners understand the new normal, as well as digital technology's differential impact on psychiatric disorders including depression, anxiety, attention-deficit/hyperactivity disorder (ADHD), and disorders of the autism spectrum. As such, practitioners must adapt the clinical evaluation of transitional age youth to include effects of technology-related mental health issues and disorders and guide patients toward balanced, healthy lives in a world dominated by screens.

Problematic Internet Use

For many adolescents and young adults, regulating digital media use is challenging; smartphones, tablets, laptops, etc., are the gateway for commerce, education, employment, entertainment, information, and socialization [100].

Researchers use a variety of terms and methods when trying to understand digital media use and when it becomes problematic. To date, there are over 60 terms describing the latter. Problematic interactive media use (PIMU) describes when overuse or compulsive use of media (both online and offline) interfere with one's daily life – having a negative impact on personal hygiene, grades, family interactions, emo-

tional and psychological issues, and relationships [87]. PIMU often presents in one of four ways: gaming, social media, pornography, and information-bingeing.

TAY with PIMU may also have coexisting diagnoses of ADHD, ASD, anxiety, depression, eating disorders, and/or substance use [93] Physically, those who have PIMU may have sedentary lifestyles, weight gain, sleep issues [93], neck/back pain, wrist/hand pain, and eye strain.

Problematic Internet use (PIU) is described as the "use of the Internet that creates psychological, social, school and/or work difficulties in a person's life" [9, p. 378]. PIU focuses upon two factors, time on the Internet and what is done on the Internet, and it includes additional ideas beyond addiction (e.g., Internet use that interferes with offline socialization).

Internet addiction focuses on an addiction specific to the Internet, describing core features of addiction such as loss of control while on the Internet or feelings of withdrawal when away from the Internet [120].

Internet gaming disorder is defined in the 2013 revision of *Diagnostic Statistical Manual of Mental Disorders* 5 (DSM-5) as a condition requiring further study, not yet an official diagnosis. Gaming disorder is listed in the *International Classification of Diseases* (ICD-11) as a diagnosis in the 2018 revision.

The figure below (Fig. 18.1) incorporates language from primary care and mental health practitioners to illustrate the relationship between Internet gaming disorder and related phenomena.

Table 18.1 compares the definitions of Internet gaming disorder and gaming disorder.

There are over 20 assessment tools that focus on different aspects of problematic use [66]. These tools may measure concepts of addictive behaviors, impulse-control disorders, or behaviors that use the Internet as a medium for other addictive behaviors. Others assess the impact of the use of existing apps [81], or devices like smartphones.

The impact of PIMU/addiction upon TAY may include physical and mental health concerns and decreased success in educational, employment, or social realms – regardless of culture. These behaviors may also have a significant impact upon the family system. For example, TAY who never leave their parents' home may have had a "failure to launch", or a "boomerang" effect may occur if the TAY returns to live at home as a result of PIMU or addiction. In both scenarios, family dynamics may be disrupted, financial stressors increased, and interpersonal conflicts intensified.

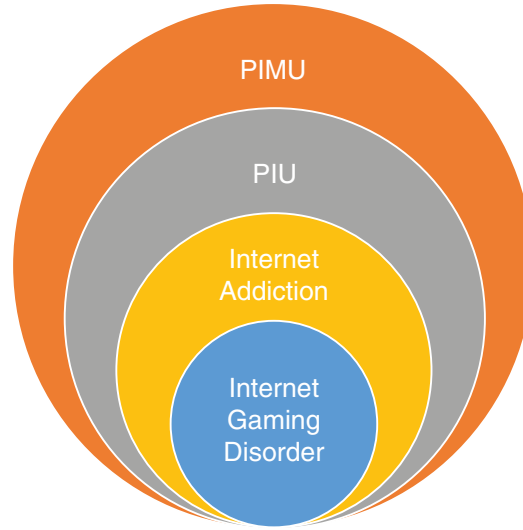

Fig. 18.1 Interrelationship of PIMU, PIU, Internet addiction, and Internet gaming disorders

The following two tables (Tables 18.2 and 18.3) summarize the current state of research and treatment evidence in therapy and in pharmacological management to address problematic use of digital media. For pharmacological management, the medications listed can be beneficial in treating PIU, which may coexist with one or more comorbid psychiatric diagnoses.

Clinical Vignette

Suzie is a 19-year-old female who has come to see a college counselor, as she is experiencing poor mood and difficulty sleeping. She is studying biomedical sciences and had an argument with a friend about a joint assignment last week. The conflict has escalated, and several other people are involved. She is worried about her reputation and feels excluded, as she is no longer welcome in her former study group. This issue

Table 18.1 Internet gaming disorder and gaming disorder comparison

DSM-5 Internet gaming disorder	ICD-11 gaming disorder
Condition for further study, not an official diagnosis	Diagnosis
Internet-based games	Online or offline video games
Criteria present within 1 year	Criteria present within 1 year
Modifiers of mild, moderate, severe	No modifiers
Repetitive use of Internet-based games, often with other players, that leads to significant issues with functioning	Pattern of gaming behavior (digital gaming or video gaming) which must be of sufficient severity to result in *significant impairment* in family, social, educational, occupational, or other important areas of functioning
5 of 9 criteria (below) needed	**All 3 bolded criteria required**
Preoccupation or obsession with Internet games	**Impaired control over gaming** **Increasing priority given to gaming** over other activities to the extent that gaming takes precedence over other interests and daily activities
Loss of interest in other life activities, such as hobbies	
Lied to others about Internet game usage	
Has lost or put at risk an opportunity or relationship due to Internet games	
Continued overuse of Internet games, even knowing how much they impact their life	**Continuation or escalation of gaming despite the occurrence of negative consequences**
Uses Internet games to relieve anxiety or guilt	No explicit discussion of these topics
Withdrawal symptoms when not playing Internet games	
Tolerance – needs more time playing games	
Tried to stop or decrease playing Internet games, but failed	

Table 18.2 Psychotherapeutic treatment of problematic interactive media use

Therapeutic approach	Details
Acceptance commitment therapy	Accept distress and neutrally engage with emotions
Cognitive behavioral therapy	Identify cognitions, behaviors, and emotions that trigger relapses and focus psychoeducational and coping strategies on the antecedents
Dialectical behavioral therapy	Increase patient's ability to be conscious of experienced feelings, thoughts, and urges so patient can make effective decisions [93]
Digital detoxification	Complete abstinence is promoted for a finite period of time
Family-based/ family therapy	Improve communication and teach family monitoring of digital media use
Motivational interviewing	Evaluation of readiness for change using precontemplation, contemplation, preparation, action, maintenance, and relapse stages
Sports intervention	Sports exercise prescriptions improved PIU [75] Exercise rehabilitation may benefit PIU [60]

has kept her up at night, and she has tried to reason with several people to rejoin the group, to no avail. Her grades are slipping, and she nearly walked into a passing car while simultaneously texting her ex-friend. She has had near misses with traffic like this in the past while using social media on her phone.

Typical Screen Habits and Mental Health Impact

Young adults of this generation come of age with significantly distinct strengths and weaknesses due to individual experiences accumulated in childhood and adolescence. Cross-sectional stud-

Table 18.3 Medication treatment of problematic interactive media use

Medication	Evidence
Atomoxetine	Improved child depression inventory scales [92]
Bupropion	11 patients open-label trial – decreased craving for video games [47]
Citalopram + quetiapine	Case report TAY w/PIU – improvement maintained at 4-month follow-up [19]
Clonazepam + sertraline	Case study of CBT to treat anxiety and Internet addiction reduced both symptomatologies [109]
Escitalopram	Case report of gaming addiction [110] Open-label trial in 19 patients, decreased time online in 11 patients [27]
Fluoxetine	Case report of pornography addiction [26]
Lamotrigine/ fluoxetine	Case report of compulsive sexual behaviors online and offline [112]
Methylphenidate (extended release)	62 children with ADHD, decreased Internet video game use time [46]
Memantine	29 subjects with gambling addiction, open label, 10 weeks decreased gambling behaviors [42]
Naltrexone + sertraline	Case report of Internet sexual addiction, depression, OCD [13]

ies done 15 years apart, in 2000 and in 2015, show a massive increase in daily screen entertainment consumption, to an average of over 6.5 hours per day for adolescents [100, 103]. The average amount of time spent online tripled during this time period, and the average amount of time spent playing video games quadrupled. Taken as a whole, the average transitional age American youth spends about twice as much time engaging in screen entertainment during their teenage years as they spend in school. The extensive time devoted to screens has displaced time traditionally spent in other activities. Generational research indicates that in 2015, adolescents spent significantly less time socializing in person with peers, going out on dates, reading books and magazines, driving, and even sleeping than at any other time in the prior 25 years [130]. However, this time period also saw a significant decrease in adolescent violent crime rates, teen pregnancy, and cigarette and alcohol use. Determining causality is difficult, but it appears that the increase in teen technology habits have displaced both healthy and risky behaviors. Current transitional age youth have less experience with socializing in person (including dating) than any generation before, which is expected to negatively impact their "offline" social skills [130]. Modern youth have also spent less time reading books and magazines for enjoyment, as well as driving, which may impact their education and options for employment as well as social life. Nighttime technology use displaces time spent sleeping, deconditions sleep habits, and increases sleep latency times following video games or other stimulating screen activities. Insufficient sleep is particularly vital to correctly identify and address in psychiatric care, because it strongly predicts depression, anxiety, and suicidality [83]. As a possible protective factor, today's youth also come of age having engaged in fewer experiences with sexual intercourse, pregnancy, interpersonal violence, and drug and alcohol use [130], which may in turn decrease susceptibility to mental disorders such as post-traumatic stress disorder and substance use disorders.

However, there are signs that the current generation is overall less mentally healthy than the last. When compared with young adults who were aged 18–25 years old in the mid-2000s, transitional age youth in the late 2010s are more likely to report specific psychological problems [131]. This relationship is illustrated in Fig. 18.2.

Changing screen habits seems to be the biggest difference between the current and previous generations. Even within the generation of young adults, increased screen habits have been associated with anxiety, depression, psychopathology symptoms, and poor sleep quality [141]. Large systematic reviews of research studies have associated time spent on screen media with depression,

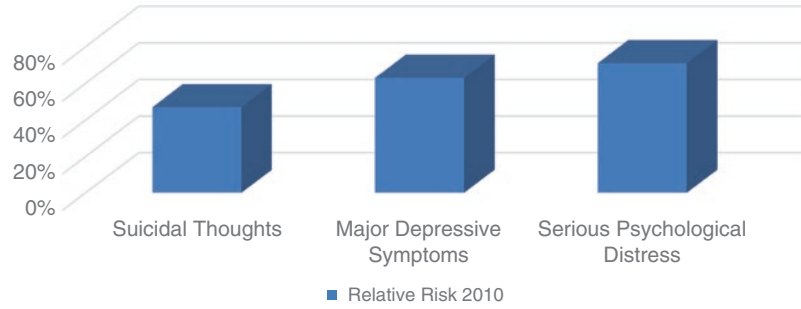

Fig. 18.2 Likelihood of mental health problems in transitional age youth in 2010 as compared to a decade before [131]

psychological distress, behavior problems, low self-esteem, and poor physical fitness, although one review found only a small effect [121].

The amount of screen time youth engage in may be less important than the choices they make regarding quantity and content of use. For example, scrolling social media while in a classroom may distract from learning, while doing so late at night may lead to insufficient sleep.

Advantages and Disadvantages of Online Experiences and Behaviors

Specific online screen habits and experiences have been associated with negative mental health outcomes and warrant particular concern: cyberbullying, sexting, social comparison, FOMO (fear of missing out), violent video game play, and viewing pornography. Cyberbullying is the use of electronic communication to bully another, typically by sending intimidating, humiliating, or threatening messages. Cyberbullying victimization is becoming more common in recent years, and it specifically predicts worsening of depression symptoms over time [67, 77]. Sexting involves sharing sexually explicit photographs or videos via electronic media and is also becoming more common. One survey of young adults found that a majority admitted to having engaged in sexting [122]. Although sexting is not always related to a negative outcome, at greatest risk are females who send a picture for the hopes of starting a new relationship [32]. Sexting has also been associated with depression, anxiety, substance use, and risky sexual behaviors [86, 119]. Social comparison refers to the human tendency to evaluate oneself based on observation of others. This concept can relate to use of various types of media, yet its effects appear particularly powerful via social media, where users often exaggerate or fabricate desirable characteristics in order to compete for "followers," "friends," and "likes." Youth engaging in social comparison are more likely to feel inferior and are significantly more likely to experience depression in relation to social media use [76, 88, 133]. Similarly, FOMO is the feeling of being excluded from experiences one's peers are enjoying. Youth who experience FOMO tend to feel inferior and self-conscious over time [59]. They are more likely to check social media accounts obsessively and to suffer negative consequences of social media use [90]. Similar to engagement with other forms of violent media, violent video game play has been found to increase aggressive thoughts and behaviors in dozens of research studies. Although the effect size is relatively small, it is significant, and may be proportional to the extent of exposure. The mental health implications of watching online pornography are largely unknown, but a significant proportion of young men endorse feeling addicted [43]. These online experiences should be assessed in psychiatric evaluations of youth and addressed in treatment when problematic.

Various habits of screen media engagement appear to confer specific skills and advantages. Regular video game play has been shown to benefit eye-hand coordination, aspects of vision such as detail resolution and contrast sensitivity, visual tracking, mental rotation, task switching, and multitasking.

Social media use may also confer specific benefits and risks to mental health. Social

media engagement has been related to increased self-esteem and social support. Youth suffering from depression and anxiety often seek help and support online, typically preferring to socialize online rather than in person. Racial minority and LGBTQ youth, as well as those with niche interests, or learning disabilities, often use social media to connect with like-minded peers and as a result feel less lonely [63]. Some studies indicate that social media engagement in youth may be protective against depression, particularly for those who receive positive feedback and online support and who engage actively, e.g., posting, commenting, and "like-ing." In contrast, other studies have found that social media use by youth who are unpopular, lack self-purpose, and are emotionally invested in their social media image is linked to negative mental health outcomes [12, 136]. Social media use may be riskier for depressed users, who are much more likely to have negative interactions on social media, to feel left out on social media, and to use social media to avoid real-world problems [101]. Youth often disclose suicidal thoughts online rather than in person. Doing so risks delaying needed help, and online discussion about suicide is related to worsening suicidality over time [31, 82].

When compared with previous generations, contemporary transitional age youth have more experience playing video games and engaging on social media. They have considerably less practice with in-person socializing and reading. They are more likely to suffer depression or mental distress, have poorer physical fitness, and have less healthy sleep habits than any time in living memory [130]. These generational differences exist, but generalizations are difficult, due to high variability in individual screen media habits and experiences. Psychiatrists who treat transitional age youth must be able to assess screen habits in patients and their effects on mental health and psychiatric disorders. Providers can guide our patients toward healthier media habits and make use of the unique opportunities computer technology offers for health and recovery.

Assessment and Formulation

Engagement with digital media is an almost universal behavior among TAY across class, sex, and culture. An unheralded level of access to media has shaped youth culture and is an aspect of daily life with multitasking of different media the new norm [95]. An expanding portfolio of evidence demonstrates an impact of digital media use on self-esteem, sleep quality, mood, risk-taking behaviors, and even propensity for accidents [3, 45, 61]. Thus, digital media use bears a role in mediating the risk of depression, anxiety, and self-injurious behavior. There is a need for mental health providers to become attuned to a rapidly shifting digital environment and for psychiatric assessments to reflect this change in youth culture [114]. However, over half of practicing psychiatrists are over 55 years of age and may have less experience with technology than the youth they are evaluating [48]. Professional organizations including the APA and AACAP work to address this practice gap via clinical updates and education about the relevance of digital media within a psychiatric assessment [1, 5].

Considering the type, extent, and impact of digital media use in their lives may be helpful as a broad framework when interviewing the patient. Being aware of the potential for media-related issues within the patient's narrative can help garner pertinent clinical information that may otherwise not be offered.

- *What* digital media does this person use? (number/type of devices, social media, video games)
- *When* do they use digital media? (time of day (night time use, work hours), duration)
- *Why* do they use these forms of media? (entertainment, distraction, boredom, information, communication, anonymity) [61]
- *Impact* – Does the patient feel their media use offers positive, neutral, or negative effects on their functioning? (in addition to objective assessment from the provider including collateral as indicated)

The approach of tailoring questions relevant to each of the assessment domains may be the most intuitive and has been proposed [18]. Psychiatric providers can quickly establish rapport and begin to guide appropriate digital media use by inquiring about digital media use as part of a psychiatric history [18]. The domains can be adapted to consider the influence of digital media within it and be tailored to the patient's presentation.

Screening tools have commonly been used for depression or anxiety, such as the PHQ-9 and GAD-7 [85, 94]. Validated, succinct tools assessing problematic media use are also available and may be a beneficial primer in assessing digital media use. The *Problematic and Risky Internet Use Screening Scale* (*PRIUSS -3*) is a three-question scale that, if positive, can be further evaluated assessing social impairment, emotional impairment, and risky/impulsive Internet use [52]. The *Bergen Social Media Addiction Scale* (*BSMAS*) is another self-report scale that has six items based on the diagnostic criteria of addiction as outlined in the DSM-5: mood modification, conflict, withdrawal, salience, and relapse [3].

Integrating the Clinical History of Media Use into Practice

History of Presenting Illness

This is the initial narrative as to why a patient is coming to seek psychiatric care. This may vary from insomnia to low mood to social problems. Curiosity and exploration as to whether media habits play a role in the chief complaint can be established here. For example, in a case of insomnia or interpersonal conflict, querying about the role of screen media and their perception of its impact may be helpful. Late evening or bedtime screen use can lead to untimely arousal, increased sleep latency, and poor-quality sleep along with suboptimal cognitive and athletic performance the next day [45, 54]. Asking how communication is conducted (e.g., Snapchats that disappear, text messaging, public posts on Facebook or Twitter) helps establish how individuals manage conflict, or if they are a victim and/or perpetrator of cyberbullying [18].

Past Psychiatric and Medical History

TAY access online resources for health-related information and may use mental health applications as their first foray into addressing mental health problems [4]. Asking about applications they utilize and whether they find them beneficial can offer an initial impression as to their treatment preferences [4]. Media use when driving increases risk for accidents and also should be discussed [41, 128].

Social History

TAY are unlikely to differentiate between "real-world" friends and friends they have only ever conversed with online – unless asked [95]. This differentiation offers an opportunity to reflect on the balance between offline and online influences and at times helps establish a diagnosis and illuminate potential risks. Asking about whether a patient uses their phone during work, class, or study is worthwhile as use of smartphones and social media during lectures has a detrimental effect on academic performance [106].

Developmental History

An exploration of how media use evolved, including at what age they started, and how their use was restricted or encouraged by their caregivers can help paint a picture of the nature of their home life and quality of caregiver relationships. Did caregivers provide adequate supervision? Were there arguments about appropriate media use? Did caregivers use screen media predominantly for play, or to soothe them as children? [140]

Safety Assessment

Research has indicated that exposure to NSSI (non-suicidal self-injury) imagery [15] and sexual predators can increase an individual's risk for self-injury or exploitation [99]. Individuals with problematic use, especially with comorbid psychiatric symptoms, are at increased risk of being victim to or engaging in risky behavior such as

cyberbullying [115]. A survey among psychiatrically hospitalized youth indicated a positive relationship between problematic Internet use and suicidality [36]. Young people are increasingly communicating distress digitally, particularly to peers [78]. Careful yet overt inquiry and education about exposure to risks and disclosure of suicidality on digital media is necessary here.

Mental Status Examination

A cross-sectional observation of what the patient does with their electronic device during the consultation is useful and can be compared with the narrative obtained [18]. This may vary from keeping it out of sight; setting it on the table; being distracted by it – replying to messages and calls; or using it to communicate with the provider by showing images or texts. This may offer a "teachable moment" whereby the provider can assess and target insight, or as a discussion point when assessing for problematic use.

Formulation

Considering the influence of digital media within each domain of a biopsychosocial framework assists in incorporating its relevance within a summary formulation. The impact of the digital environment youth exist in and have created should be considered within [35]:

- Biological aspects including light exposure, sleep, sedentarism, physical activity, or eating habits [18]
- Psychological aspects: mood including depression, anxiety and FOMO, general sense of well-being [139]
- Social aspects: social supports and the connectedness and similarities between online and offline environments including risks taken

A digital media assessment can help to generate a more holistic and realistic view of the patient with an appropriate management plan tailored to their presentation. This may include intermittent periods of abstinence to reduce stress [129], increased engagement in sports, CBT, or another psychotherapy to target addictive Internet behaviors [87].

Clinical Vignette

Raquel, a freshman at a community college who lived at home, was spending increasing amounts of time alone in her bedroom. Worried about her isolation and moodiness, her mother encouraged her to see a therapist. During the initial meeting, Raquel slumped into a chair, her gaze fixed to the floor. She admitted to habitually coming home after class to confine herself to her bedroom and to spend hours online. Raquel lacked motivation to leave the house or spend time with her family or "offline" friends, preferring connection with her "online-only" friends. Raquel told her therapist that she frequently felt sad and bored but enjoyed watching videos on YouTube. Conflicts often arose with her mother over how much time she has spent online. Raquel dealt with loneliness by further scrolling through the feeds of social media sites, which was often followed by feelings of sadness and hopelessness. Raquel found herself in a cycle of depression and excessive time spent online. Raquel sacrificed sleep and in-person relationships for her activities online. She admitted to frequently updating her status on social media sites and checking responses to her posts, feeling frustrated and disappointed when she received too few "likes," or responses.

Depression and Anxiety

Raquel's story is not uncommon among transitional age youth (TAY). Many struggling with negative mood turn to the Internet for information, entertainment, social connection, and support, often with negative consequences. TAY with moderate to severe depression report a heightened affective response to social media experiences, both positive and negative [101]. Internet devices are immediately available sources of education and feedback. Today's TAY are coming of age at the same time that new digital technologies are emerging as the preferred source of personal expression, entertainment, and information. TAY search online for information about their health conditions as well as to find support from others afflicted with similar issues; 87% of 14- to

22-year-olds access the Internet for health information [101]. However, those dealing with anxiety or depression are vulnerable to certain aspects of digital technology. Compared with peers, anxious and depressed youth prefer socializing online. Internalizing youth often use social media to combat loneliness, but are also more susceptible to cyberbullying and other negative online interactions [11, 96].

Like many of her peers, Raquel's emergence into adulthood coincides with a period of increased autonomy, the emergence of mental illness, and poorly regulated digital technology habits. Major transitions mark this life stage, with TAY typically entering the workforce or college, often moving to a new community in the process. New onset, or exacerbation of existing mental illness, frequently occurs during this time period. Youth now progress through these milestones with the Internet as a constant companion. Although TAY typically seek support and relief from distress online, overdependence on digital technology may lead to ineffective coping skills, increased social isolation, addictive use of social media, and, ultimately, worsening distress.

Young adults who spend the most time online report the highest rates of depression and anxiety [49, 71, 117] as well as suicidal ideation and attempts [60, 78, 113]. Studies of various Internet activities (social media, gaming, blogs, shopping sites, and topic-specific platforms) have found that the highest utilizers of each endorse the most anxiety and depression [79, 89, 125].

TAY endorsing anxiety and depression report more negative interactions online than their peers, a pattern which often worsens the problem. These include:

- Cyberbullying [53] – both perpetrators and victims are significantly more likely to engage in self-harm or suicidal behaviors [105, 132].
- Problematic interactive media use – particularly social media, whether excessive use is intended to manage negative mood states or youth experiencing psychological distress experience greater emotional distress as a result of their use [51, 98, 116, 132, 137].
- Problematic experiences on social media such as attention-seeking behaviors and suffering FOMO [117] – depressed youth spend more time on social media platforms, more frequently checking for reactions to their posts.

Determining causality in the association between Internet habits and psychiatric disorders is complex. The majority of currently published studies utilize cross-sectional designs and are unable to conclude the directionality of the association between Internet habits and psychopathology. However, individuals with excessive and inappropriate Internet use frequently endorse greater rates of depression or anxiety. Youth with internalizing disorders appear to be uniquely vulnerable to the effects of excessive or inappropriate Internet use.

Many TAY prefer to seek information and support for their psychological issues online. A 2018 Hope lab survey found that adolescents and TAY with depression use the Internet for several purposes [101]. TAY often conduct online research as their first step in better understanding their mental health concerns. Websites, blogs, apps, and social networking groups dedicated to mental health issues appeal to many youth with a variety of psychiatric diagnoses. These resources are readily available and can be used anonymously. However, many online resources are not affiliated with a recognized academic or treatment organization and may contain misleading information. Globally accessible platforms allow for youth to connect with individuals experiencing similar problems, who may be better able to understand shared experiences. Used appropriately, the Internet is a powerful tool for TAY to understand and manage their psychiatric symptoms. Supportive family or friends can use similar online tools to engage TAY dealing with such problems.

In planning interventions for TAY dealing with anxiety and depression, special consideration should be given to the role of their online activities. Formal assessment of Internet habits in TAY presenting with depression or anxiety should be part of all initial evaluations. Intensity and frequency of use, platforms used, and other

patterns of use can affect anxiety and depression. Understanding patients' online lives will help providers create better-informed treatment interventions. Treatment should include helping TAY identify problematic behaviors and emotional responses related to digital technology, thus reducing or removing unhelpful online behaviors and increasing positive use of technology and other healthy behaviors. The Internet is a powerful educational tool, a source of peer support, and many TAY are receptive to using technology as a component of mental health treatment [38]. The Internet can enable providers who work with TAY to better understand, treat, and support patients.

Clinical Vignette

Aaron, a college freshman, presents to his first appointment with a psychiatrist during his winter break. His parents had insisted that he see a psychiatrist after learning that he had received C's and D's in his first semester. He had been diagnosed with attention-deficit/hyperactivity disorder (ADHD) in third grade by his family doctor, but with treatment had become an A and B letter grade student who was also active in sports. Aaron stares at the floor as the psychiatrist asks about his semester. Aaron insists that he is taking his stimulant daily, but complains of often missing deadlines for assignments, feeling unprepared for tests, and struggling with insomnia. Aaron admits to spending hours, both during and outside of class time, playing a popular multiplayer game. He subscribes to several YouTube channels featuring others playing the game and finds it difficult to turn off his devices to attend to his schoolwork.

Attention-Deficit/Hyperactivity Disorder

It is no surprise that newly-independent Aaron struggled with self-monitoring his Internet habits. TAY with ADHD are particularly susceptible to excessive Internet use and addiction. In such cases, inappropriate and excessive Internet habits further exacerbate physical, psychological, and biological disability. Childhood associations between ADHD and excessive technology use (e.g., causing difficulties with social relationships, sleep, and behavior) persist in transitional years [2, 10]. TAY with insomnia have higher rates of both ADHD and Internet addiction [34]. Those with greater ADHD severity typically have increased social impairment as well as higher levels of state and trait anger, leading to social isolation [107]. Social isolation, in turn, contributes to excessive Internet use, which perpetuates isolation in a vicious cycle. Online activities incorporating high risk or reward, such as gambling and gaming, are particularly habit-forming for those susceptible to addiction. Digital technology is emerging as an important factor in how symptoms of ADHD manifest in TAY.

ADHD, comorbid symptoms, and poorly regulated Internet habits can profoundly impact functioning. TAY and adults with ADHD have higher levels of Internet addiction, a construct recognized worldwide but not yet defined in DSM 5 [49, 69, 124, 135]. Internet use disorders are associated with maladaptive behaviors and negative mood states. Impulsiveness, loneliness, and impaired behavioral inhibition are predictors of Internet addiction among adults with ADHD [70]. Internet gaming disorder is associated with impulsivity and hostility in TAY [142]. Severity of ADHD symptoms is associated with severity of Internet addiction in TAY, particularly so when the Internet is used to help regulate negative emotions [33]. The immediate gratification, fast-paced interfaces, and constantly moving screens may alleviate immediate feelings of boredom [33]. Left unchecked, excessive online behaviors interfere with offline functioning.

Achieving autonomy and independence, key developmental tasks for this age group, are threatened by factors that impair executive functioning skills. A significant proportion of ADHD cases diagnosed in adulthood report an absence of symptoms in childhood, calling into question whether an alternative etiology is responsible for their symptoms [20]. Adults with recent-onset ADHD symptoms are more likely to endorse symptoms of Internet addiction compared to controls [69]. Engagement with video games and

other screen media has been linked to deteriorating attention over time [123]. Similarly, gaming disorder has been linked with the development of ADHD symptoms [80]. Although causality is impossible to prove from this data, excessive Internet habits may cause or worsen symptoms of ADHD. When evaluating ADHD, especially for adults with new-onset symptoms, care must be taken to also assess technology habits.

When working with TAY in clinical settings, priorities should include strengthening self-monitoring and self-regulation skills including challenges uniquely impacted by ADHD symptoms and Internet use (e.g., time management, limit setting, need for immediate feedback, problems with sleep and interpersonal relationships). These TAY require strategies to manage these issues to improve their overall functioning. Recognition of the interrelationships between these varied problems will help patients gain insight into their vulnerability to problematic Internet use.

Clinical Vignette

Tony is a 20-year-old male with autism spectrum disorder (ASD) who lives with his family. He was "too high functioning" for vocational rehabilitation services but has not been successful in keeping a job. He doesn't have "real-life" friends; he has "virtual" friends online. When his parents tell him to stop gaming, he throws things; his tablet and controller broke. He learns about sexuality and relationships from online forums, mainstream media, and pornography. He has tried to meet romantic partners via social media but has been unsuccessful.

After Tony and his parents contacted the Office of Vocational Rehabilitation about his employment challenges, he met with a job coach who explained professional interactions in the workplace and via email. He and his family began co-watching movies and programs, and his family taught him which observed behaviors were unreasonable. Tony also joined a social skills group where he made some acquaintances and learned "rules" about appropriate and inappropriate behavior online and offline. They talked about topics like independence, safety, relationships, sexuality, courtship behaviors, consent, pornography, and the law. His therapist also referred him to reliable online resources.

Autism Spectrum Disorder

TAY with autism often find that interactions online are less threatening to navigate [25]. They also have patterns of Internet use that differ from their peers, listed in Table 18.4.

Data demonstrates that TAY with ASD have greater compulsive Internet and video game use, which can lead to fewer opportunities to develop social, academic, and occupational skills and negative impacts for their families. Technology

Table 18.4 Media habits of youth on the autism spectrum

Topics	How youth with ASD differ from peers
General use	More computer use [65]
	Preference for online communication over face-to-face interaction
	Less use of social aspects (email, social media like Facebook, texting)
	Discussion forums: more specific interests and a greater number of interests [55, 56]
	Higher rates of non-social media use (i.e., television and video games)
Online social interactions	More comprehension and control over communication, access to similar others, and the opportunity to express their true selves [37]
	More positive friendships after receiving emails from friends or visiting social networking sites [65]
Employment	Increased social problems – obstacles concerning communication and human interaction in non-autism-specific employment [74]
Gaming	More likely to use mobile phones for games than their peers
	More difficulty disengaging from playing video games, feeling upset when not able to play, getting angry when interrupted from games, and playing longer than intended

can help initiate social interactions with like-minded others, but maintenance of connections with desired friends and romantic partners, knowledge of who is trustworthy, and assessment of appropriate disclosure can be challenging [16]. Benefits and limitations of various low- and high-tech social outlets for this population are listed in Fig. 18.3.

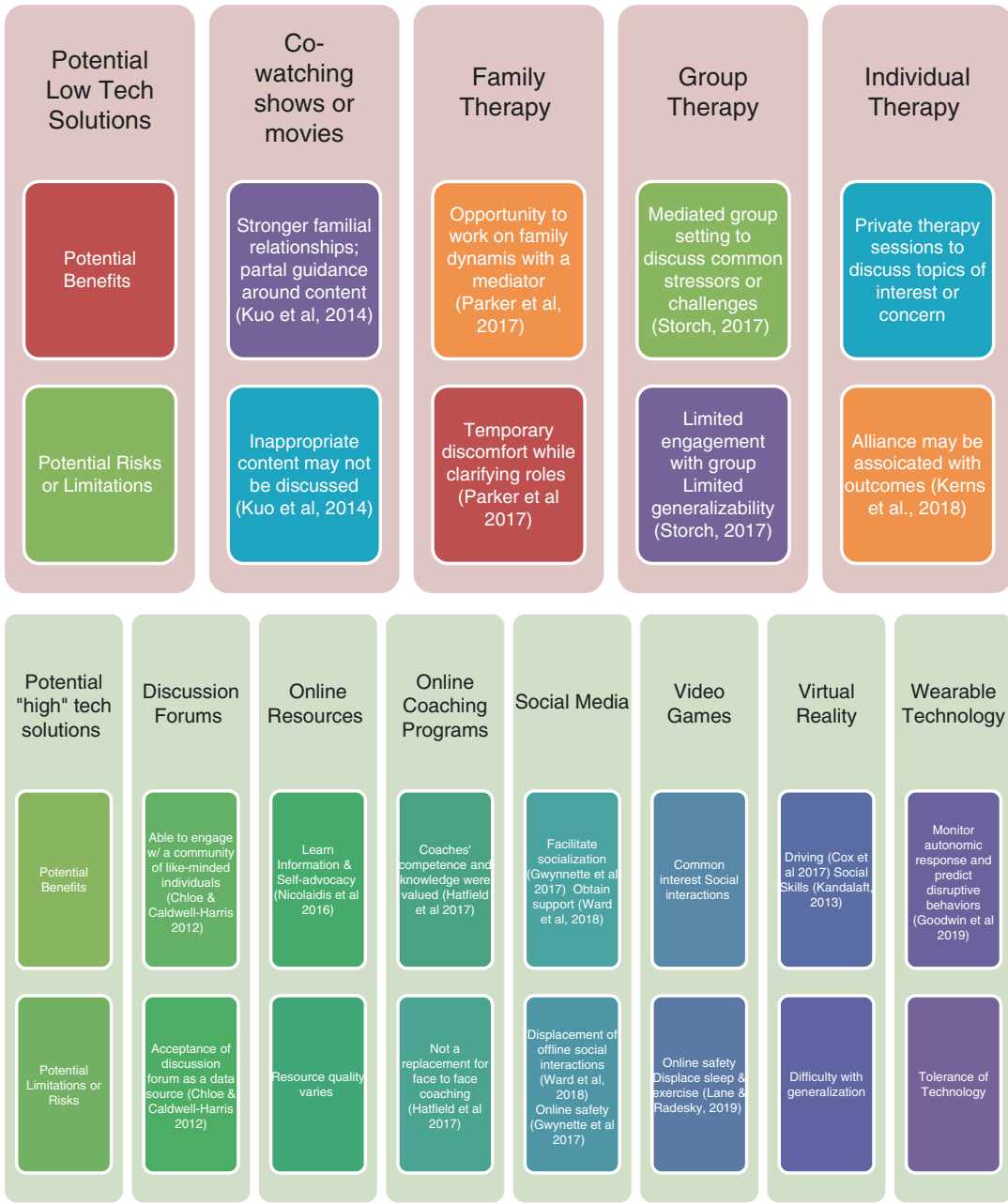

Fig. 18.3 Social outlets for TAY with ASD

Integrating Technology into Treatment

Digital media and related technology are incrementally becoming a part of mental healthcare delivery – from booking appointments online; text messaging services to deliver information and support (e.g., Caring Contacts) [23]; or enabling access to emergent help such as crisis text line, or HIPAA-compliant telepsychiatry services (e.g., VSee) [40, 73]. As mental health burden outstrips current psychiatric resources, digital therapeutic options could play a crucial role in addressing the gap in services [127].

A growing area of interest is mental health applications ("apps"), of which there are over 10,000 claiming to benefit mental health [127]. Patients may already be using these applications in lieu of or to supplement traditional treatment options [91, 97]. Potential advantages include affordability, wide-ranging geographical reach, immediate accessibility in a crisis, improving engagement, and lowering the stigma of seeking psychiatric help [4]. Yet optimism needs to be tempered with caution. The vast majority of apps lack robust evidence of efficacy [68], and many of the exceptions are apps specifically designed for a trial and not commercially available [4, 30, 97]. However, where RCT evidence is available, the results are encouraging [29, 111]. Unfortunately, the rapid development of apps means that their rigorous study is impractical. Practitioners ought to be aware that many apps may be evidence informed (rather than evidence based), unhelpful, or even harmful, and most do not fall under the remit of FDA regulations [4, 68, 127].

The APA does not endorse or supply ratings for specific apps. However, an APA app evaluation model has been published providing guidance to clinicians as to how to examine the utility, suitability, risks (including privacy issues), and benefit of a particular app before recommending it to patients in clinical practice [5, 22]. This model is illustrated in Fig. 18.4 and includes using the app to gauge whether it may add value to specific aspects of clinical care, e.g., stress management, strengthening adaptive coping skills (e.g., the meditation app Headspace) [22], or medication reminders (e.g., MediSafe [108]). Chan et al. also provide questions relevant to these domains to consider before recommending an app [21]. Behavioral activation and physical exercise can be encouraged using apps that utilize "gamification" methods such as Zombies, Run! and

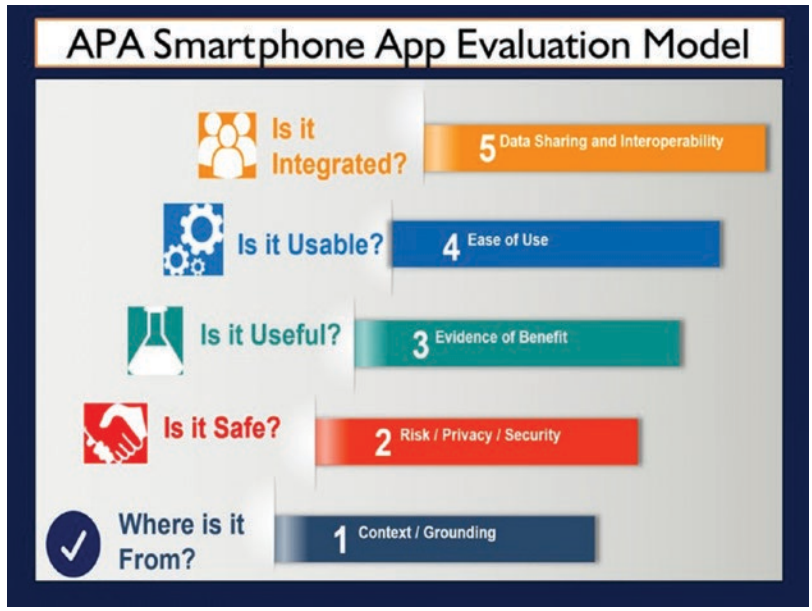

Fig. 18.4 APA app evaluation model [126]. (Adapted APA app evaluation model, reproduced with permission from author)

SuperBetter [7, 104]. The gamelike interface and rewards system have been shown to increase motivation for individuals to reach their goals [22, 84].

Apps engaging in real time or ecological momentary assessment of mood, thoughts, or behavior (e.g., MoodPrism, T2 Mood Tracker) lend themselves well to outpatient care [30, 91]. These may be useful for diagnostic clarification. Apps are perceived positively by youth and can improve patient engagement in treatment [91]. Additional benefits include increasing emotional awareness, reduced subjective experience of depression, a positive "digital placebo effect," and, importantly, limited potential for adverse effects [4, 6, 7, 30]. However, a barrier to clinical use is the inability to incorporate and store app data with current EMR systems [127].

AACAP suggests a few applications, e.g., MY3, which assists users with a readily available safety plan and contact information of supports that they have pre-created for use in times of crisis [1, 72, 127]. However, they are recommended with the proviso that all are utilized in conjunction with a provider [1, 127]. A recent meta-analysis of CBT treatment formats indicated that guided digital self-help was as effective as individual or group based ones for treatment of depression [24]. A burgeoning area is virtual reality exposure therapy via apps such as ZeroPhobia [29]. RCTs have indicated these helpful for an array of anxiety disorders including phobias [17, 29, 58]. CBT-i Coach for insomnia and PTSD Coach, developed by the US Veteran Affairs, have also demonstrated some efficacy [50, 62, 64].

Digital therapeutics are becoming a credible option for treatment, and some app creators are seeking FDA approval as a legitimate treatment option for psychiatric disorders. Recently the FDA approved the app "reSET" for the treatment of substance use disorder (in conjunction with face-to-face treatment) [134]. Other apps that are undergoing FDA approval include Headspace and Akili Interactive Labs' video game for ADHD treatment, for which initial trials yielded positive results [102].

Clinical Vignette

Maria is a 19-year-old female who was living at home while taking classes at the local community college. She had difficulty with making new friends but stayed connected to her high school friends on social media. She did play a couple video games, watch videos, and looked up facts about her favorite topics, but she spent hours on social media instead of doing her schoolwork. After late nights online, she often slept through morning classes. By the time the semester ended, she had regular complaints of neck pain, day and night reversal, and poor grades (C's, D's, and an F).

Maria connected with a therapist and psychiatrist through her college mental health center. She was diagnosed with social anxiety, started on escitalopram, and began the spring semester. She was motivated to see peers in her afternoon classes. With her therapist, she improved her time management – building in time for assignments, physical exercise, eating, and sleeping. Any remaining time before bedtime, she spent at her discretion online. She ended the semester with A's and B's and some acquaintances that she might socialize with over the summer.

Solutions

Higher work- and school-related demands, greater freedom, more opportunities for socializing, and reduced family-related structure and support create increased autonomy and difficult choices for TAY. "On-the-fly" decision-making regarding media engagement is a poor strategy due to its high cognitive demands, poor prioritization, susceptibility to impulsive decisions, and the ever-present digital distractions.

For healthy functioning, TAY should adopt a time management approach which prioritizes productive work and essential responsibilities, captures goals, lists important tasks, and schedules events. Tasks requiring sustained attention must often be "chunked," broken up into manageable portions. TAY should cultivate healthy habits incorporating exercise, in-person socializing, cre-

ative activities, and routine chores. A consistent work routine is preferable to sporadic expenditures of effort. Creating calendars, setting timers, and making lists help to organize activities.

Many TAY must be taught about the costs of multitasking. Multitasking has not been shown to cause permanent cognitive deficits [8, 118], but it reduces productivity and increases fatigue [57]. The brain's data processing systems truly only focus on one thing at a time, so what appears to be multitasking is actually rapid shifting of attention back and forth. Cognitive energy and efficiency are lost each time the attentional filter changes from one task to another, the costs of which quickly accumulate.

Frequent distractions and interruptions (such as those created by screen media) reduce productivity in much the same way. Each time sustained attention is turned away from active work, efficiency is sacrificed. The extra effort required to shift attention frequently may give "multitasking" TAY the mistaken impression they are working efficiently. Even the mere availability of an inert smartphone within reach creates a distraction significant enough to hinder cognitive performance [138].

Addressing problems of multitasking and frequent interruption are most important for TAY already suffering disorders which interfere with cognitive control and attention, such as depression, anxiety, and ADHD.

Finally, getting sufficient sleep is an essential activity, not a waste of time as many youth believe. TAY are easily caught up in subcultures which discount the benefits of sleep and normalize insufficient sleep habits. Sleep researcher Lauren Hale has suggested the approach of desist, dampen, and dim. This can be understood as (1) *desist* by stopping digital media at least 1 hour prior to bed, (2) *dampen* by avoiding arousing material just prior to sleep, and (3) *dim* by reducing screen light intensity to minimize sleep-disrupting blue light exposure after sunset [44].

Problematic technology use habits are common in TAY, and professionals should assess these problems as well as motivation for change, coping skills, and psychosocial supports before setting treatment goals. Depending on this assessment, either a harm reduction or abstinence-based approach may be appropriate. It may be helpful to reframe unhealthy or problematic digital behaviors as misguided methods to meet one's basic needs such as receiving attention, stimulation, self-expression, affiliation, or control. Matching these needs with alternative, enjoyable, healthy non-digital activities is often the key to an optimal outcome [39]. A lack of mindfulness often plays a role in excessive online engagement [14]. Transitional age youth should be encouraged to notice and tolerate impulses to use their devices. Creating self-awareness represents a good start while other interventions are initiated. Regular media "fasts" (i.e., periods of abstinence), along with scheduling screen-free elements of daily routine, will help prevent relapse and reduce incidents of overuse. A detailed list of dilemmas associated with technology habits and their solutions can be found in Table 18.5.

Table 18.5 Technology-related dilemmas and solutions

Area of concern	Solutions
Privacy – exposure to junk mail, spam, identity theft, account hacking, and ransomware which misappropriate personal information *Safety* – involvement with stalking, cyberbullying, or disputes risking legal problems or retaliation. Vulnerability to distracted driving and walking	Wise sharing of sensitive information, especially that which may attract unwanted attention, create conflict, or alienate others Use platforms, apps, and websites which are transparent regarding data collection and safeguards Use strong privacy settings on video games, apps, and websites
Displacement of movement – lack of physical activity and deconditioning *Repetitive stress injury* – particularly of the neck, back, and eyes. Contracture and weakening of abdominal and back musculature skeleton due to disuse	Increase exercise, consider fitness tracker or monitoring through phone or mobile device Take frequent screen breaks, set timers to cue breaks Engage a full range of movements of every part of the body Use a standing desk or treadmill, walk while listening or conversing on devices, and schedule times to stand

Table 18.5 (continued)

Area of concern	Solutions
Sensory overload – underexposure to nature Loud, distracting, and agitating noises. Noise-induced hearing loss, often caused by excessive headphone volume *Sleep /circadian rhythm disturbance* – underexposure to natural lighting and overexposure to nighttime light, especially blue light	Seek leisure activities which maximize opportunities in green spaces away from urban stressors Honor the importance of sleep Align digital media use with natural circadian rhythms Turn devices off when not in active use Decrease screen brightness settings or use blue light-filtering glasses at night Use eye shades and earplugs to minimize disruptive sensory exposure to nighttime light and background noise
Attention fatigue and difficulty with focus –excessive time with digital media causing ADHD- like symptoms *Lack of productivity* – digital media displacing essential activities such as work or school. Frequent distractions or "multitasking" causing ineffective work or learning	Minimize distractions including multiple active devices, open windows, pop-ups, notifications, or email Prioritize cognitive energy toward important tasks "Chunk" work into manageable intervals, intermixed with breaks for physical activity and creative diversions Manage information flow via a system which helps order goals, organize dataflow, and ensure task completion
Cognitive distortions related to distorted information and false narratives – worsening of emotional and cognitive deficits via media featuring narrow perspectives, negativity, and/or distorted social comparison, or promoting inaccurate, depressogenic, and anxiety-generating schemas	Self-assessment of positive vs. negative emotional valence and behavioral impacts of engagement with various media sources Monitoring influences on rigid or negative thought patterns, cognitive distortions, and avoidance behavior Build awareness of stressors inherent in following news media, marketing manipulations, and divisive rhetoric
FOMO and/excessive social comparison – distress based on anxieties regarding missed social activities, exclusion, and envy Fueled by recognition of a narrowed social life and relationships primarily conducted through digital media	Avoid social media or other digital diversions which increase distress and isolation Self-assess the balance between online and offline relationships Create a practice to be thankful for what you have, rather than what you lack Proactively establish etiquette and expectations in housing or dorms which promotes real-world experiences
Parental over-involvement/infantilizing – digitally enabled enmeshment and related parental overprotection	Establish boundaries regarding levels of family involvement. Consider digital calendars or reminders to schedule contact TAY may need to set limits on overinvolved parents and prioritize the establishment of an independent identity
Online conflict – cyberbullying and digital "drama." Many platforms, especially those with anonymous posting, support negativity, tribalism, or hate. Due to amplification effects and permanency of the online record, hostile interactions can have long-lasting, more profound effects	Understanding that lack of social cues and anonymity in electronic communication exacerbate conflict Careful stewardship of personal digital footprint and reputation When angry, wait 24 h before sending related posts, texts, or email, and consider going offline to engage directly
Identity formation, purpose, and meaning – disconnected "offline" lives lack social bonds and purpose. Lack of meaning is especially painful for those dissatisfied with school or work and those subscribing to popular and consumer culture emphasis on status and wealth	Assess whether digital media habits are building community and positive relationships Constructive risk-taking regarding building identity and contributing to community Seek out creative and social outlets unrelated to work or school

Conclusion

Today's TAY appear different than previous generations, in part due to the technologies interwoven into their lives. They are required to use smartphones, computers, and other digital devices to function in their school, work, family, and social lives. TAY have ready access to unlimited digitally mediated leisure activities and diversions. They lack role models for media habits and must pave a new path navigating complex and tempting digital environments.

A successful launch into adulthood will require effective strategies, including setting realistic limits on digital media use, effectively prioritizing activities, and honoring the importance of sleep, in-person contact, and physical activity. In clinical populations, unhealthy habits are common, including PIU – problematic Internet use. Changing harmful patterns is often difficult, especially in TAY whose habits are engrained over a substantial portion of their lives. A valid assessment of digital activities is complicated because many intermix benefits (e.g., socialization, learning, and stimulation) with unhealthy patterns that compromise other aspects of life.

Mental health providers working with transitional age youth must assess the quantity, quality, and impact of their digital media habits. Asking the right questions regarding Internet use is vital to gathering the essential information. Thankfully, screening tools can help simplify and standardize such assessments, as can digital devices themselves.

For example, a quick smartphone assessment notes frequently used apps, notification settings, total screen time, and daily steps walked. With little effort and expense, such important data can be gathered, as well as time spent on apps or games. Smart devices can track physiological measures such as blood pressure, medication adherence, or sleep. In the near future, digital devices could routinely and automatically download directly into electronic medical records, easing the identification and tracking of relevant health patterns and simplifying treatment plans.

For TAY, digital media-related issues are often important enough to warrant a substantial component of the biopsychosocial formulation. An ever-expanding range of apps, online treatment, and emerging uses for virtual reality efficiently augment traditional care. Digital technologies can enable patients to learn clinically relevant information and track mood states and could prompt patients, thereby increasing medication compliance, or completion of psychotherapy "homework" assignments.

Thus the paradox of growing up digital is constantly evolving, creating new challenges and opportunities. Youth benefit from virtually unlimited information, the ability to track one's own habits and enhance personal relationships with improved communication. Yet, simultaneously, they suffer far more distractions; receive less trustworthy information, with online acquaintances replacing friendships; and have powerful enticements to establish unhealthy or self-destructive digital behaviors.

To quote Dickens: "it was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness" [28]. Today's digitally native TAY enjoy many positive trends with regard to safety, health, and quality of life. However their generation must contend with an epidemic of depression, anxiety, and suicidality. TAY face unprecedented challenges related to their digital media devices, yet they wield powerful new tools capable of enhancing their lives. Mental health providers who have stood witness to these trends and are well-informed are capable of providing practical solutions to new versions of timeless challenges inherent in emerging into adulthood during extraordinary times.

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