

How the pandemic has affected the mental health of adolescents and how to prepare for the longer-term consequences

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Montreal, Dec 5th 2022

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Hello, I am Perry Adler, the Director of the Teenage Health Unit at the Jewish General Hospital’s Herzl Family Practice Centre.

My co-presenter is Dr. Bana Hejazi, who will be introducing herself later.

Disclosure of Conflicts of Interest

- None for either of us

Slide 2: Conflicts of Interest:



In response to the COVID-19 pandemic, governments first focused on strategies to contain the spread of the virus and to create sufficient capacity in hospitals to manage acute medical needs.

Now, they and we must recognise the unprecedented threat to global mental health as a consequence of the pandemic.

Children and adolescents have been particularly susceptible to negative mental health effects related to their vulnerable developmental stage.

Workshop learning objectives

- Apprise you which teenage mental health issues have increased in prevalence during the pandemic
- Help you better screen for these issues
- Present the risk and protective factors associated with these issues

Our goals for the workshop are to:

1. Inform you of the teenage mental health issues that have increased in prevalence during the pandemic and may continue to be elevated in the coming months or even years
2. we hope to help you to better screen for these problems
3. And we will present the risk and protective factors associated with these issues

Step 1: Original Search on PsycInfo and PsycArticles Yielded 644 Results

Step 2: Visual examination of all titles for relevance (i.e., containing correct population, looking at COVID/pandemic/Coronavirus, and Mental health outcomes of some kind (n = 56)

Step 3: Reading of abstracts for relevance to answer the question "How the pandemic is affecting teen mental health? Implications for future functioning? What can be done to help teens?"

Step 4: Additional references from articles/google scholar added

EATING DISORDER SEARCH (in Google Scholar)

Search terms: "Eating Disorder*" OR "Restricted Eating" OR "Bulima" OR "Anorexia" AND "Teen*" OR "Youth*" OR "Adoles*" AND "Pandemic" OR "COVID"

GAMING ADDICTION SEARCH (in Google Scholar) *Initial search did not result in many relevant articles, so expanded to include other forms of screen usage.

Search terms: "Screen*" OR "Video game*" OR "Gaming" OR "Internet" AND "Teen*" OR "Youth*" OR "Adoles*" AND "Pandemic" OR "COVID"

November 2022 - Updated literature search completed using ("Adol*" OR "Teen*" OR "youth") AND ("COVID*" OR "pandemic") AND ("Consequence*" OR "Sequelae" OR "Effect*" OR "Impact*") and ("Addict*" or "substance" or "alcohol*" or "cannabis" or "internet" or "porn*" or "gamb*") → Yielded 48 articles

Also read articles from citations from above → Total articles read 169

To derive an informed sense of the mental health consequences of the pandemic we conducted an extensive literature review. This slide gives you an idea of part of what our lit search entailed.

We reviewed both cross-sectional and longitudinal studies, from Quebec, Canada, and across the globe. We distilled the results down to the major repeated findings across all our readings.

Depression and Anxiety in Adolescents

- Significant increases in referrals & admissions for wide variety of mental health problems (Furey, 2021; Haripersad et al., 2021; Solmi et al., 2021; Szklarski, 2021; Wilton, 2021).
- Overwhelming evidence of increased symptomology and prevalence of teens meeting DSM criteria for depressive & anxiety disorder (review examples: Samji et al., 2022; Racine et al., 2021).
- Globally ~1/4 adolescents met clinical criteria for an anxious or depressive disorder (Racine et al., 2021)
- Prevalence of these disorders nearly doubled since the start of the pandemic

Our lit review strongly indicates that there was a significant increase in prevalence of and referrals & admissions for a wide variety of mental health problems since the start of the pandemic.

Even before the pandemic, growing numbers of young people were experiencing high rates of mental health issues. For example, about 11% of adolescents had clinically significant anxiety in 2012, up 20% from 2007. But during the pandemic, those numbers nearly doubled, such that one-fifth of youth worldwide now struggle with anxiety symptoms, according to a meta-analysis reported in [*JAMA Pediatrics*](#) - which included

81,000 youth. Prevalence rates were higher when collected later in the pandemic, in older adolescents, and in girls.

Another excellent review of 116 articles, presenting data on 128,000 children and adolescents over the pandemic's first year had very similar findings.

These increases were likely fueled by pandemic-related stressors like fear of infection, illness and death, social isolation, missed milestones, increased family tension, suspension of regular school and extracurricular activities and contraction of community supports and services, as well as by background stressors such as school shootings, political unrest, and global financial recessions.

Importance of addressing elevated anxiety

- Those with elevated social anxiety symptoms from ages 10 to 18 years are, in adulthood...
 - 20X more likely to be depressed
 - 16X more likely to have social anxiety disorder
 - 16X more likely to have agoraphobia

Do not underestimate the importance of addressing elevated anxiety in your patients. The continuity of psychopathology is well illustrated in a recent study which found that Canadian youth who followed an elevated trajectory of social anxiety symptoms from ages 10 to 18 were 20 times more likely to be depressed, 16 times more likely to have social anxiety disorder, 16 times more likely to have agoraphobia in adulthood compared with those who followed a low trajectory of social anxiety symptoms across childhood and adolescence

A caveat: Because of pandemic restrictions and the population's general unease in presenting themselves for medical attention during the first year of the pandemic, the statistics related to the prevalence of many problems, especially mental health ones, are most likely underestimates. As an anecdote, every psychologist I know in private practice has never been busier with most no longer adding people to their long waitlists.

ER Visits and Suicidality

- RAMQ data showed:
 - 28% increase in antidepressant use in children 14 years and younger from 2019 to 2021
 - Suicide attempts increased 23% between 2019 and 2021 in 15-19 years old
- Toronto Hospital for Sick Children saw a 120% increase in ER visits for mental health concerns during pandemic's 1st year
- Children's Healthcare Canada reported double the number of admissions following attempted suicide during the pandemic
- Centres for Disease Control and Prevention noted a 31% increase of depression for 12-17 year-olds at the beginning of the pandemic (Leeb et al. 2020).

According to RAMQ data, there was a 28% increase in antidepressant use in children 14 years and younger from 2019 to 2021. Suicide attempts increased 23% between those two years in those aged 15 to 19.

During the first year of the pandemic the Toronto Hospital for Sick Children saw a 120% increase in ER visits for mental health concerns.

[Children's Healthcare Canada](#) reported double the number of admissions following attempted suicide across a similar time comparison.

The American Centres for Disease Control and Prevention noted a 31% increase of depression for 12 to 17-year-olds at the beginning of the pandemic

Loneliness: A Consequence & Mediating Factor

- Adolescents felt lonelier during the pandemic which contributed to the decline in adolescents' emotional adjustment (Sabato, Abraham, & Kogut, 2021).
- Highly extraverted adolescents reported greater increases in loneliness, and subsequently increased levels of depressive symptoms (Alt, Reim, & Walper, 2021).
- Greater peer connectedness during the pandemic was associated with a reduced odds of suicidal ideation during the pandemic among girls (Hutchinson et al., 2021).

Adolescents rely more heavily on friendships and social contacts than any other age group. Peer interactions play an important role in the development of their identity and personality.

Lockdowns and distancing measures resulted in a drastic reduction of possibilities for adolescents to be with friends, resulting in a considerable decline in feelings of affiliation and support. Several studies documented that many adolescents felt lonelier during the pandemic and that loneliness contributed to the decline in their emotional adjustment during the pandemic.

Interestingly, highly extraverted adolescents were most likely to report increases in loneliness, and subsequently had increased levels of depressive symptoms.

High-quality peer relations buffered the pandemic's negative effects on teens' functioning. For example, greater peer **connect-edness** during the pandemic was associated with reduced odds of suicidal ideation during the pandemic amongst girls.

Stay-at-home mandates, online learning, and social distancing requirements led to increased reliance on digital media for nearly all facets of adolescents' lives (e.g., entertainment, socialization, education).

Pros & Cons of Digital Media Use for Teens' Mental Health During the Pandemic

- Overall increased screen time associated with worse mental health outcomes during the pandemic, but it depends on the type of usage (Li et al., 2021; Thygesen et al., 2022; Marciano et al., 2021)
- Online one-to-one communication, self-disclosure in the context of mutual online friendship, and positive and funny online experiences mitigated feelings of loneliness and stress
- Passive use of social media has had negative effects (Nagata, J. M., et al, 2022)

Overall, increased screen time has been associated with worse mental health outcomes during the pandemic -

but it depends on the type of usage.

Several studies suggested that some of the negative effects of the pandemic have been alleviated by teens staying connected with friends online.

In particular, one-to-one communication, self-disclosure in the context of mutual online friendship, as well as positive and funny online experiences mitigated feelings

of loneliness and stress. Hence, these positive aspects of online activities should be promoted.

While active social interactions through the internet had a beneficial effect for many teens, there is overwhelming evidence that more passive use of social media has had a negative effect on the mental health of teenagers before and during the pandemic. The main risk factor is the engagement in upward social comparisons.

Upward Comparisons



When we compare ourselves to someone who we believe is better off than us, this is known as an upward social comparison. This was useful as a learning mechanism when we, as pre-civilized humans, compared ourselves to the under 100 people living in our tribe – most of whom were not that much different from us.

Extreme Upward Comparisons



Now, with mass media and the internet, we can compare ourselves to billions of people, and find extreme exceptions to the norm.

Dark Magic...



We follow the lives of billionaires, the superstars of athletics, music, and fashion – and feel inadequate in comparison.

Negative Effects of Upward Comparisons

- Frequent & more extreme upward comparisons immediately reduce self-esteem, mood, & life satisfaction
- People with low self-esteem make more frequent & more extreme upward comparisons



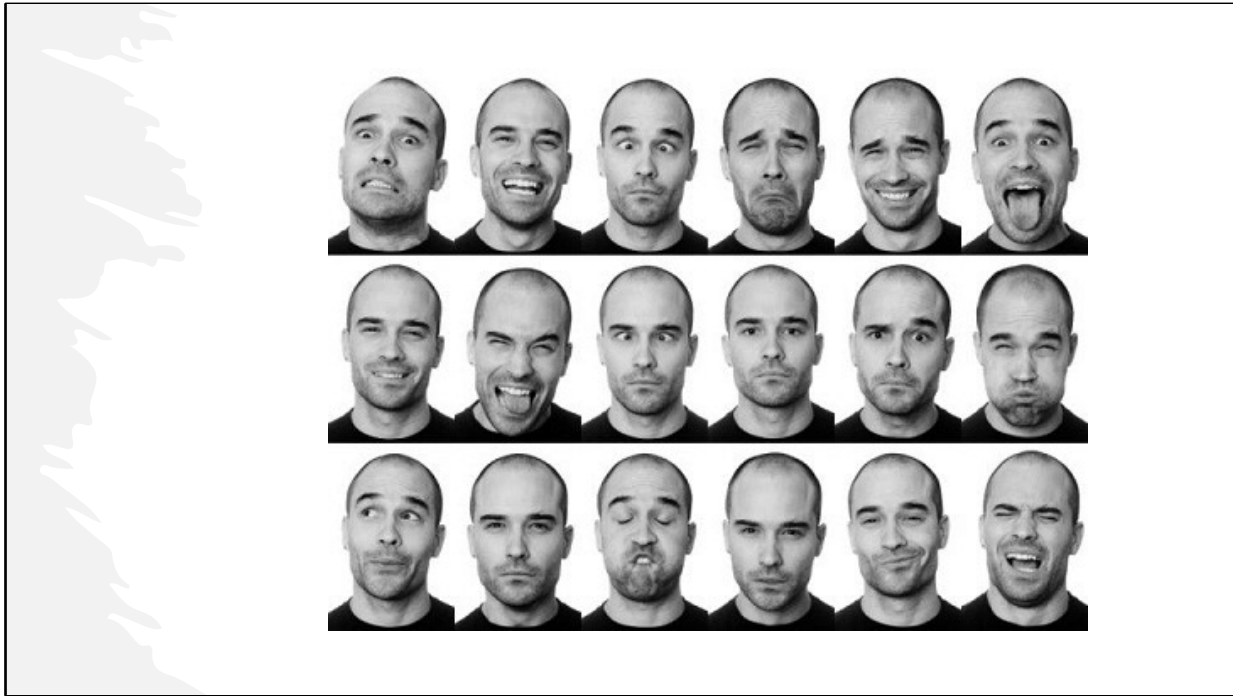
When we have fewer likes or views on our social media accounts, we assume that we are less desirable or likeable. Many studies have shown that this erodes self-esteem and contributes to social anxiety, eating disorders, and depression.

A 2020 study of 800 people showed that more frequent and extreme upward comparisons made during A social media browsing session resulted in immediate negative effects on their self-esteem, mood, and life satisfaction. People with low self-esteem were particularly vulnerable to making more frequent and more extreme upward

comparisons on social media, which in turn worsened their already-lower self-evaluations. A vicious circle.

When it comes to video games, while the literature is a bit mixed, the emerging consensus is that they are less likely to cause mental health problems in teens – at least in the short term. I will tell you why I am worried about longer terms effects.

Playing video games and most forms of social media used by teens to communicate are done without seeing and hearing the person with whom they are interacting.



Doing so for hours a day reduces in-person face-to-face interactions and the ability to learn crucial social skills, such as the ability to read facial expressions, tones of voice, and body language cues that help one understand what a person is really feeling or meaning.



Children and teens are missing out on the thousands of hours of face-to-face visual and oral communication needed to develop crucial social skills. They are less able to understand and successfully navigate the complex vagaries of social life, leaving them confused, frustrated, and all too often rejected by others. This leads to anger, anxiety, sadness, and depression.

For nearly two years we struggled with repeated and extended social distancing mandates that, even when together in the same rooms, we could not see the facial expressions of others behind masks. Imagine the

negative impact this has had on the brain development of toddlers to teens.

I predict that for a minority of young people, this reduced ability to practice and learn these skills in person will lead them to have more deficits in social skills than had the pandemic not occurred, and for some, these deficits will appear as symptoms of Autism. For a larger percentage, they will suffer symptoms of social anxiety disorder, because they will have reduced social skills.

Rising rates of autism due to digital media is starting to be shown in research findings.



A 2022 JAMA article reported that among boys, longer screen time at 1 year of age was significantly associated with autism spectrum disorder at 3 years of age.

Autism Odds Ratios Among Boys With “No Screen” as the Reference

- less than 1 hour of screen time: odds ratio = 1.4
- 1 to 2 hours = 2.2
- 2 to 4 hours = 3.5
- more than 4 hours = 3.0.

In a study of over 84,000 mother-child dyads, the prevalence of children with autism at 3 years of age was 0.4%, with boys 3 times more likely to have been diagnosed with autism. Among boys, when “no screen” was the reference, the adjusted odds ratios were as shown on the slide, with any usage above 2 hours associated with a 300% or more greater likelihood of developing Autism.

These findings support my worry. Interestingly, among girls, there was no association between autism and screen time.

Eating Disorders

- 62%-105% increase in rate of referrals and 64%-300% increase in admissions to ER for eating disorders since start of pandemic
 - (Chadi et al., 2021; Racine et al., 2021; Haripersad et al., 2021; Solmi et al., 2021; Szklarski, 2021; Nutley et al., 2021; Castellini et al., 2020; Schlegl et al., 2020; Singh et al., 2022)
- Increasing rates of ED are more prevalent in provinces with higher rates of COVID-19 infections (Agostino et al., 2022)
- Youth hospitalized during a lockdown were over 8-times more likely to be readmitted within 30-days of discharge compared to patients hospitalized before the pandemic (Matthews et al., 2021)

In Canada and in other countries, pediatric eating disorder programs reported an unprecedented increase in the number of referrals and hospitalizations for eating disorders since the beginning of the pandemic as well as an increase in disordered eating symptoms in the general population

For example, a study of about 1900 patients at six pediatric hospitals in Canada in November of 2020 found that new diagnoses increased during the first wave of the pandemic by 64% compared to the prior five years, which had stable numbers. Hospitalizations for newly

diagnosed patients increased 167%.

Another study reported that youth hospitalized during a pandemic lockdown were over 8-times more likely to be readmitted within 30-days of discharge compared to those hospitalized before the pandemic.

In summary, findings across multiple studies showed that pandemic eating disordered patients:

- had shorter courses of illness
- were more medically unstable, needing more hospitalizations
- And exhibited higher rates of nutritional restriction and functional impairment

Reduced Academic Functioning During the Pandemic

- 15% of adolescents had significant decreases in academic motivation and performance

School closures and teleconference learning resulted in about 15% of adolescents having significant decreases in academic motivation and performance.

Substance and Alcohol Use

- Some studies found prevalence of youth substance and alcohol use remained mostly stable during the first months of the pandemic
- Some reported a three-fold increase in admissions related to substance use
- Problematic use increased in some higher-risk youth

While some studies found that the prevalence of youth alcohol and substance remained mostly stable during the first months of the pandemic, probably due to fewer opportunities for social use, some reported a three-fold increase in admissions related to substance use, and problematic use increased in many higher-risk youth, such as those with concurrent mental health conditions

Summary of mental health problems more prevalent during the pandemic

- Depression
- Suicidality
- Anxiety Disorders: especially social anxiety, but screen for agoraphobia & OCD
- Excessive screen use
- Poorly developed social skills → autism spectrum disorder
- Eating Disorders
- Decreased academic motivation & performance

Here is a summary of the aforementioned mental health problems for which we found repeated evidence of greater prevalence since the start of the pandemic.

Risk Factors for Worse Mental Health Outcomes During the Pandemic

- Pre-existing mental health problems:
 - psychiatric disorders
 - internalizing disorders
 - emotional dysregulation
- Parental mental health problems
- Poor social support: from family or friends
- Loneliness
- Extraversion

This slide, and the next two, list the risk factors that we repeatedly found to be associated with mental health issues during the pandemic. Pre-existing individual characteristics such as ineffective coping or emotion regulation strategies...

Risk Factors for Worse Mental Health Outcomes During the Pandemic

- High use of internet, social media - passive screen time
- Older adolescents
 - To develop greater independence, need to socialize more than do younger teens
- Girls
- Neurodevelopmental conditions
 - Learning disorders
 - ADHD
 - Neurodiversity
- Pre-existing/chronic physical health problems

...or having neurodevelopmental conditions or chronic physical health problems...

Risk Factors for Worse Mental Health Outcomes During the Pandemic

- Disadvantaged or minority status communities. They experienced:
 - Greater loss of family income
 - Higher rates of illness and death among community members
 - Virtual connectivity problems
 - Less able to do schoolwork online from home
 - Less able to connect with friends online
 - Limited living space
 - Increased tension and conflict due to lack of privacy and secluded respite

...or contextual factors such as low SES or minority status all put teens at greater risk.

Of concern is that for a substantial group of adolescents, risk factors might cluster, resulting in cumulating and cascading effects of the pandemic across multiple interrelated aspects of their lives. As these teens are also less likely to have the individual, family, or community resources to deal with these negative consequences, they might be more likely to experience negative outcomes across multiple domains of functioning.

Protective factors associated with better mental health during pandemic

- Basically, the opposite of most of the risk factors
- Physical activity/exercise
- Having a structured routine
- More time in nature
- Getting adequate sleep

The protective factors are basically the opposite of most of the identified risk factors as well as the kindergarten rules of a living a healthy life: which include eating your vegetables, taking a nap, playing outside

Mental distress rampant among physicians

- A Canadian Medical Association survey of 4,100 physicians and medical residents in late 2021 found:
 - 60% said that their mental health had worsened since the onset of the pandemic
 - 14% had suicidal thoughts in the prior 12 months
 - 48% tested positive for depression, up significantly from 34% in 2017
 - 25% experienced severe or moderate anxiety
 - 53% experience high levels of burnout
 - 79% scored low on professional fulfillment.

In a Canadian Medical Association survey of more than 4,100 physicians and medical residents in late 2021, 60% said that their mental health had worsened since the onset of the pandemic, with 14% having suicidal thoughts in the prior 12 months. 48% tested positive for depression; 25% experienced severe or moderate anxiety, and 53% experienced high levels of burnout and 79% felt professionally unfulfilled.

We are highlighting this study to encourage you to take care of yourselves, not just others.

Next, we want to present you with recommendations on how to be better equipped to meet the worsened mental health of teens brought on by the pandemic.

PRE-VISIT INTERVIEW QUESTIONS FOR ADOLESCENTS DURING COVID-19 PANDEMIC
Please return your completed questionnaire to us **TODAY**
Email address: herzi@tgh.mcgill.ca

Name: _____
Date: _____

Is your main concern for physical health issues or mental health issues?

☐ PHYSICAL HEALTH ISSUES ☐ MENTAL HEALTH ISSUES ☐ BOTH

The following are health problems young people sometimes have. Please tell me which of the following problems you are experiencing:

<input type="checkbox"/> Dizziness/ Fainting	<input type="checkbox"/> Headaches	<input type="checkbox"/> Other pains
<input type="checkbox"/> Nausea/ Vomiting	<input type="checkbox"/> Stomach aches	<input type="checkbox"/> Discharge from penis or vagina
<input type="checkbox"/> Diarrhea/ Constipation	<input type="checkbox"/> Chest pain/ Trouble breathing	<input type="checkbox"/> Menstruation (Period) Problems

☐ Other physical health problems: _____

Some teenagers are sexually active. Please tell me which of the following you worry about or want to discuss with a doctor:

☐ Sexually transmitted infections
☐ Birth Control, pregnancy test, or abortion: _____

Some young people believe they are unattractive or too overweight. Do you worry a lot about your appearance?

☐ Yes ☐ No

Are you worried about or troubled by:

☐ Bullying/ Violence/Your Safety?
☐ Issues related to your sexual orientation or gender identity?
☐ Self-injury or mutilation (e.g. cutting/ hitting/ burning yourself)?

Some young people have been abused physically, sexually, or emotionally. Is this happening to you?

☐ Yes ☐ No If Yes, do you feel safe at home? ☐ YES ☐ NO

Which of the following have you been feeling almost every day for the past two weeks?

☐ Angry or irritable
☐ Sad
☐ Feel like you don't get any fun out of life
☐ Feel like killing yourself. If yes, please answer the following

1. Do you have a plan how you will suicide? ☐ YES ☐ NO

2. How likely are you to try to suicide within two weeks? ☐ 0% chance ☐ 25% slight chance ☐ 50% likelihood ☐ 75% very likely ☐ 100% certain

☐ Would you like to get counseling or meet with a psychologist?

At the Teenage Health Unit, we ask patients to complete the “Pre-visit Questionnaire (PVQ)”, which is sent through our electronic medical records system or handed to them during their first in-person visit. The PVQ screens for a variety of issues common to teens - both biomedical and psychosocial. Obtaining this information allows us to be more efficient and effective in developing a mutually agreed upon agenda for their visit.

HEADS-Driven Interview

- H = Home
- E = Education / Employment / Eating disorders
- A = Activities / Accidents / Abuse
- D = Drugs / Depression
- S = Sex / Suicide

We strongly recommend using a HEADS-driven interview with teen patients to properly screen for most of the problems we identified as showing increases in prevalence due to the pandemic.

H = Home - explore the quality of their relationships at home and the home environment

E = Education:

- screen for learning disabilities, ADHD, dropping grades, bullying, sexual harassment, conflicts with teachers

E = Employment: Hours/week; what they do with \$

E = Eating disorders

A = Activities: See if adaptively engaged in life. Explore what they do during free time.

A = Accidents

A = Abuse: Physical, Sexual, Emotional, Neglect

D = Depression

D = Drugs:

- Coffee & Energy drinks, Alcohol, tobacco, drugs. Determine frequency, quantity, consequences (e.g., blackouts, regrettable behaviour while under the influence).

S = Sex:

- Avoid terms that are unclear, e.g., “sexually active”. Use precise questioning, e.g., “What sexual experiences have you had, from holding hands to kissing, to oral sex, vaginal sex, anal sex, with boys, girls, or both?”
- Ask about sexual orientation and gender identity.

S = Suicide

LA MÉDECINE DE L'ADOLESCENCE

Il y a plus de trente ans, la médecine des adolescents était intégrée à la médecine pédiatrique. Cependant, au fil du temps, avec les changements économiques et socioculturels, l'émergence de la sexualité des adolescents qui sortait de la clandestinité, les drogues, le divorce des parents, les troubles alimentaires, le suicide, la dépression et l'explosion des réseaux sociaux grâce à Internet, la nécessité de créer une branche de la médecine distincte de la pédiatrie s'est imposée.

Vous trouverez, dans ce numéro, des articles qui vous aideront à mieux prendre en charge certains problèmes difficiles de la médecine de l'adolescence.

L'adolescence, période de la vie à mi-chemin entre le monde de l'enfance et de l'âge adulte, est difficile, complexe et fascinante. Elle comporte aussi son lot de maladies et de traitements qui lui sont propres.

L'adolescence est un moment de l'existence où tout peut basculer dans le bon comme dans le mauvais sens et où la médecine préventive de première ligne devra se pencher de plus en plus sur le suivi de ces êtres à l'apparence indépendante, mais qui sont au fond bien vulnérables.

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