

# Consequences of COVID-19 restrictions on adolescent mental health and drug abuse dynamics

S. MARINELLI<sup>1</sup>, G. BASILE<sup>2</sup>, L. DE PAOLA<sup>3</sup>, G. NAPOLETANO<sup>3</sup>, S. ZAAMI<sup>3</sup>

<sup>1</sup>School of Law, Polytechnic University of Marche, Ancona, Italy

<sup>2</sup>IRCCS Orthopedic Institute Galeazzi, Milan, Italy

<sup>3</sup>Department of Anatomical, Histological, Medicolegal and Orthopedic Sciences, University of Rome "Sapienza", Rome, Italy

*S. Marinelli and G. Basile contributed equally to this study*

**Abstract.** – The COVID-19 pandemic has hit elderly people the hardest in terms of severity and mortality. However, it is also evident that children and adolescents have been significantly impacted and experienced major disruptions in their lives. The psychological, mental, and developmental repercussions have been major and have led to a reshaping of drug abuse dynamics and substance addiction. The authors have outlined a narrative review of the major issues affecting adolescents and their mental well-being by clarifying the lingering effects and pandemic aftermath, especially on drug abuse, developmental aspects, and behavioral addiction. The unique traits of adolescent risk factors have been outlined, in order to identify areas to be prioritized for future strategies. Possible repercussions on juvenile crime linked to social estrangedness and disrupted interactions have been briefly explored as well. All such aspects are highly meaningful and relevant from a medicolegal perspective as well. The looming mental health crisis involving youngsters will have to be confronted by fine-tuning and optimizing mental health care services, building on current experiences, raising awareness, and eliminating the stigma that often comes with mental issues. Healthcare systems should look at the current scenario as an opportunity to improve care delivery to eliminate access inequalities and stigmatization of mental issues and raise awareness for the benefit and well-being of all. Similarly, law enforcement, lawmakers, and the judiciary will have to account for such factors, too, as will economic policy-makers. In that regard, a set of defining criteria has been framed in order to provide a degree of objectivity when meeting the unique challenges of the pandemic for youth mental health, in a comprehensive and tailored fashion.

## Key Words:

COVID-19, Adolescent mental health, Drug/behavioral addictions, New psychoactive substances (NPS), Behavioral dysregulation, Adolescent stress responses.

## Introduction

Although the COVID-19 pandemic has hurt elderly people the worst, from the standpoint of severity and mortality, children and adolescents have suffered major upsets and disruptions in their daily lives. The psychological, mental and developmental repercussions have been considerable, and worthy of investigation.

The authors have set out to succinctly expound upon the major issues affecting adolescents and their mental well-being as the pandemic seems to recede by clarifying the lingering effects and pandemic aftermath for mental health, likely to affect youngsters for years to come. A succinct analysis of the unique traits of adolescent risk factors has been outlined (from the biological, psychological, neurological, and social perspectives) for the purpose of identifying areas to be prioritized for future strategies. Also, despite the current dearth of research, the potential impact of pandemic-related disruptions and restrictions (and the mental burden thereof) on youth crime rates has been investigated in light of the millions of individuals who have been deprived of their ability to identify, commit and belong within a social ecosystem in which to function socially and emotionally. The looming mental health crisis involving

youngsters will have to be confronted by fine-tuning and optimizing mental health care services, building awareness, and eliminating the stigma often attached to mental health issues. The delineation of new viable strategies, along with the adjustment of current approaches, will, in fact, be essential both for providing care to those currently in need and in case a new pandemic threat should ever loom on the horizon<sup>1-5</sup>. Furthermore, such findings have considerable medicolegal value in terms of defining innovative frameworks to tackle novel youth crime evolving dynamics.

### Methods

The authors have started with a broad-ranging analysis of determinants and contributing factors to the pandemic impact on youth mental health and maladaptive behaviors. To that end, currently, available research studies in medical databases PubMed/Medline, Scopus, Web of Science, and Research Gate, have been taken into account, spanning the May 2020-October 2023 period through search strings such as “COVID-19 pandemic”, “drug abuse”, “addiction”, “adolescent mental health”, “behavioral/emotional/neurological dynamics”, “youth crime”; sources pre-dating that time span have been drawn upon for broader perspective and insight into youth mental health dynamics and distinctive traits, to contextualize such underlying factors. In addition, opinions, recommendations and guidelines by medical and scientific associations (e.g. the World Health Organization, the European Society for Child and Adolescent Psychiatry, the American Psychological Association, the United States Centers for Disease Control and Prevention, the Italian Society of Childhood and Adolescence Neuropsychiatry) have also been accounted for, in order to shed light on the distinctive traits and conditions determining the risks for adolescent mental health in the pandemic context and the prescription for adjusting current approaches to meet the growing demand for healthcare services stemming from such a crisis. Only the sources strictly related to adolescent mental health distinctive traits have been ultimately accounted for, most of which sought to shed light on youth mental health and how it was impacted by the pandemic. Out of 137 sources, 100 were closely related to the pandemic-substance addiction-youth mental health correlation, while sixteen were chosen for

the purpose of interpretative contextualization of such data, notably youth crime psychological determinants, contributing factors, and medicolegal prospects. This approach has strengths and weaknesses: it is closely focused on obtaining relevant data and putting them into context, but it cannot provide conclusive causal relationships. Juvenile crime trends in the aftermath of the pandemic are still under-researched. Longitudinal studies and meta-analyses will be needed to obtain clear profiles of correlation, even more necessary to provide targeted care by adjusting and fine-tuning our healthcare responses.

### Multiple Factors to Account For

Considering the 137 sources carefully chosen and utilized in this article, it is essential to evaluate and analyze all pertinent findings regarding adolescent mental health in the context of the pandemic. This examination aims to establish a framework of principles and standards for guiding future interventions and adjustments.

#### *Adolescence-Related Vulnerabilities*

The COVID-19 pandemic, the impact of social distancing and mask mandates, and the discontinuation of activities have weighed heavily on adolescents, majorly affecting their mental health. Anxiety, depression, sleep, and eating disorders, in addition to altered dynamics of social interactions, have been reported<sup>6,7</sup> as the most common presentations. Pandemic long-term consequences are likely to continue to adversely affect children’s and adolescents’ psychological well-being.

In light of the adolescents’ different developmental and socialization needs, factors such as school closures, stay-at-home orders, and the inability to meet their friends and peers have severely tested their mental forbearance and well-being.

Far from being a mere place of learning, schools are, in fact, where meaningful relationships and interactions are built and where the first friendships are established, along with shared objectives, aspirations, achievements, challenges, failures, and successes. In this context, the significance of the data released by the United Nations becomes particularly pronounced: the pandemic has caused the largest disruption to education systems in history, affecting nearly 1.6 billion students in more than 190 countries on all continents; school closures have been estimated an impact on 94% of the world’s student population<sup>8</sup>. For a

deeper understanding of this phenomenon and to identify its distinctive features and complexities, the authors have focused on adolescents with and without preexisting vulnerabilities (e.g., addiction disorders, eating disorders, body dysmorphic disorder, environmental adverse conditions negatively affecting development, and behavioral dynamics). Adolescents are, in fact, greatly invested in social interactions as part of the process of gradually separating from their parents. Thus, social distancing requirements have impacted them differently than adults from the emotional perspective<sup>9</sup>. Depending on their age and developmental stage, many adolescents are likely to have experienced difficulties understanding the real implications of the pandemic and how their world was affected by it. The pandemic mental toll is more challenging for adolescents since this age range (between the ages of 13 and 17) lacks the psychological capabilities of resilience and coping and the physiological development of adults<sup>10</sup>. The economic and personal stress, along with increasing mental health symptoms experienced by many parents, especially single ones and those with young children, can obviously affect their children directly, who may even be at increased risk for child maltreatment due to pandemic-related stressors and situations<sup>11</sup>.

It is important to emphasize that the complex process of internalizing issues and environmental factors progresses gradually with the transition from childhood into adolescence<sup>12</sup>. It is, therefore, reasonable to assume that a uniquely demanding and stressful event, like the pandemic, and ensuing major restrictions are likely to have led to higher rates of health issues; that would be especially true considering the already mentioned reduced levels of resilience and coping capabilities on which youths can generally rely. The development of such skills is, in fact, closely linked to the maturation of specific brain regions, which do not fully develop until adulthood<sup>13</sup>. Particularly, research<sup>14</sup> has clarified the essential role of the ventromedial prefrontal cortex (VMPFC) in the modulation and regulation processes in cooperation and altruistic behaviors for social interactions in in-group memberships, in addition to controlling social tasks, shaping moral judgment, social decision-making, and social emotions. When individuals engage in social interactions, particularly within the groups where they belong, the VMPFC is uniquely relevant in the shaping of such social life interactions, even more so during adolescence.

### ***Isolation and Exclusion Threaten Development and Balance***

A highly meaningful negative association has been established<sup>15</sup> between emotional self-regulation and instances of social exclusion, giving rise to or exacerbating feelings of anger and sadness. A healthy form of development and functioning can only rely on self-regulation capabilities, which ultimately make it possible to manage, shape, and modulate individual behavior and develop effective and well-rounded social skills and the ability to keep social interactions, while at the same time gauging such exchanges according to the peculiarities, traits, feelings and needs of others<sup>16,17</sup>.

Toxic feelings arising from social isolation and exclusion compounded by the pandemic restrictions are the most important predictive factors of suicidal ideation (SI), possibly leading to suicide attempts<sup>18</sup>, along with emotion dysregulation linked to anxiety and depression in adolescents. It is in fact essential to put in place responses and interventions aimed at providing timely care for adolescents experiencing SI before such an aberrant state of mind can be acted upon and turn into a suicide attempt, although no current data point conclusively to an increase in juvenile suicide rates either during or in the aftermath of the pandemic<sup>19,20</sup>. Lockdowns and the inability to participate in social contexts may result in the unfulfilled need for belongingness among young individuals. Such a need (which is also defined as the need for connection or relatedness) has been expounded upon from the perspective of the so-called self-determination theory<sup>21</sup>. Such a theoretical framework rests on three pillars: three basic psychological needs constituting the very bedrock of self-regulation, psychological viability and mental health, the need to belong, and the need for autonomy (i.e. being able to feel in control of one's own behaviors and goal-setting) and competence (that is gaining mastery of tasks and learn different skills)<sup>22</sup>. It is during adolescence that the need to belong or connect and relate is felt the most. It is, in fact, in such a life phase that a peer group comes to coincide with a primary social frame of reference, particularly in regard to the family<sup>23</sup>, with the development of personality traits and particularly through the acquisition of unique skills and proclivities necessary to fulfill one's own social needs and roles, according to individual character traits and distinctive features. It is, therefore, of utmost importance to clarify how, and to what extent, severely limited in-person interactions, restricted to the

immediate family, have thwarted the normative social-emotional development of our teens<sup>24</sup>. It is safe to assume that mental and emotional distress arising from dysregulation<sup>25,26</sup> can be caused or significantly compounded by an unmet need to satisfy one's sense of belonging, thus negatively affecting psychological and mental health as the pandemic restriction drew on.

Furthermore, the stress responses of adolescents, and therefore their vulnerability to negativity (possible contributors to states of anxiety and depression during the lockdown), could have been affected by abnormally high levels of parental stress and family conflict<sup>26,27</sup>. Parental perception of COVID-19 has been found to be related to their children's psychological symptoms; hence, when family circumstances became challenging or troublesome during the lockdown, adolescents tended to experience more severe emotional issues. The mental health aftermath of harsh pandemic restrictions on adolescents from countries where COVID-19 hit hard has been assessed by a broad-ranging study<sup>28</sup>, which concluded that 76.6% of the sample experienced symptoms such as difficulties in concentrating. Such findings may be mostly ascribable to the upsetting of daily routines and the introduction of distance-learning mandates (high levels of stress and anxiety, and difficulties in concentrating have been linked to remote learning, although with high variations due to individual student characteristics, e.g. age, self-regulatory learning skills, cognitive load distribution more on the individual rather than the group, and environmental and access-related factors)<sup>29-32</sup>. The study did not consider possible COVID-19 infection symptoms during that time frame, which can give rise to similar symptoms as well (inattention, low energy levels and fatigue, and even cognitive issues); the interpretation of such findings is therefore limited.

Adolescents with preexisting mental health conditions usually have to face even greater challenges during periods of crisis. Such a vulnerability may be a result of isolation, feelings of uncertainty, lack of daily routines, or restricted or discontinued access to school-provided health services, all of which are likely to have a bearing on emotional development<sup>33-36</sup>. Such adolescents have always experienced greater difficulties, but the pandemic has had major repercussions on their quality-of-life levels. Globally, 10-20% of adolescents suffer from mental health issues of varying severity<sup>37</sup>. Moreover, it is crucial to acknowledge the exacerbated impact that the pandemic has

placed on vulnerable youth populations. Homosexual, bisexual, or transgender adolescents, as well as teens with a history of eating disorders or obsessive-compulsive disorder (OCD), have been reported<sup>38,39</sup> to be more susceptible to such negative dynamics, with girls being impacted more harshly. Stay-at-home orders have, in fact, compelled such individuals to spend much more time with often unsupportive family members, with no chance to engage in socialization activities that are highly relevant to identity development at that age<sup>38-40</sup>. Data<sup>41</sup> also suggest that sexual minority youths have been pursuing identity-specific online resources during the crisis much more frequently than before in an effort to offset such a deprivation. Teenagers with anorexia nervosa have also been reported<sup>42</sup> to engage more often in unhealthy eating habits, with a considerable 70% increase of those reporting poor eating habits as well as thoughts associated with eating disorders. post-traumatic stress disorder (PTSD) rates among teens who were already exposed to maltreatment and abuse before the pandemic have been reported<sup>43,44</sup> to be growing considerably, as have rates of anxiety. Studies<sup>45</sup> specifically focused on gender have pointed to higher rates of pandemic-originated anxiety among girls. Young people who had been undergoing treatment for obsessive-compulsive disorder (OCD) or had completed such therapeutic pathways prior to the pandemic also experienced a major worsening of their symptoms (44.6%)<sup>46</sup>. In a February 2023 report<sup>47</sup>, the United States Centers for Disease Control and Prevention (CDC) raised a warning about teenage girls being subjected to record-high rates of sexual violence and at higher risk for adverse mental health outcomes, with a nearly 3 in 5 girls report feeling persistently sad or even hopeless<sup>48</sup>.

The report, which accounts for 17,232 respondents and is the first conducted since the pandemic broke out, has confirmed sexual minority youths to have suffered from an even higher level of mental health distress, with close to 70% reporting feelings of persistent sadness and hopelessness. Alarming, suicidal ideation rates were much higher among such adolescents as well, with 22% of US teens in this group attempting suicide in 2021. No trend data were available on LGBTQ+ students because of changes in survey methods.

### ***Changing Addiction Trends***

The scope and impact of the COVID-19 pandemic on substance use trends involving young-

sters have not yet been fully clarified, with various studies<sup>49</sup> reporting somewhat inconsistent findings. Still, it can be argued that the pandemic, with its considerable burden of severe distress, boredom, social isolation, anxiety, and depression, all of which are risk factors for adolescent substance use, has made consumption patterns evolve and become less controllable<sup>50-53</sup>. A far-reaching alteration of drug trafficking and abuse has been caused by the pandemic. Such a change has paved the way for new supply and demand channels, which the current surveillance and detection frameworks are struggling to keep up with<sup>54</sup>. Now, with the pandemic hopefully subsiding with the spread of less harmful variants, it should not be taken for granted that substance use and smuggling dynamics will automatically revert back. Worrying findings released by the United States National Center for Health Statistics<sup>55</sup> show that in the first full year of the pandemic in the United States and until April 2021, drug overdoses have climbed by almost 30%, totaling more than 99,000 from 77,000 in the previous year. Moreover, 75% of such overdose deaths were caused by synthetic opioids, primarily fentanyl. Other substances, such as heroin, methamphetamines, and cocaine, have also spread considerably.

### ***The Pandemic and the New Psychoactive Substances (NPS) Crisis***

NPS are substances of abuse that are not listed in the 1961 Single Convention on Narcotic Drugs or the 1971 Convention on Psychotropic Substances. Evidence<sup>56,76</sup> shows that the COVID-19 pandemic may have worsened the NPS crisis. The reallocation of resources to counter the crisis has, in fact, damaged drug monitoring, surveillance, screening, and public health responses. The major threat posed by NPS abuse is again confirmed by the relatively recent appearance of isotonitazene, an analog of a benzimidazole class of analgesic compounds, a powerful synthetic opioid, and full mu-opioid receptor agonist belonging to the 2-benzyl benzimidazole group of compounds, which also include clonitazene, metonitazene, and etonitazene (different in structure)<sup>56</sup>. At least five different forms of isonitazene have been detected in European markets as a possible replacement of fentanyl derivatives<sup>57</sup>. The elusive nature of NPS is well represented by available findings on isonitazene abuse dynamics and deaths, which are remarkably different from fatalities related to synthetic opioid abuse. The detection of flualprazolam has been reported<sup>58</sup> in most

fatalities associated with isotonitazene, while it was only involved in 8% of other synthetic opioid overdose deaths. Such data appear to point to likely co-use or co-distribution of flualprazolam and isotonitazene, rather than growing background use. While it is worth stressing the prevalence of poly-substance use in synthetic opioid overdose fatalities, a greater number of substances were found<sup>59,60</sup> in deaths caused by isotonitazene use compared to other synthetic opioid overdose fatalities. Considering such evolving dynamics and mortality trends, it is essential to reconfigure and adapt health services for opioid addiction. Since common fentanyl testing strips are not fit to identify isotonitazene<sup>61-64</sup>, detection procedures also need to be updated by relying on specialized assays based on more sensitive and suitable tools designed for the timely and dependable recognition and classification of such new synthetic opioids<sup>65-68</sup>. Clinical and toxicological procedures designed to keep up with new substances or classes are vital to effectively tackle such daunting public health risks and the healthcare and social costs thereof<sup>69</sup>. Still, at first, the distinctive traits of novel substances can only be identified by user experience<sup>70-73</sup>, but the COVID-19 pandemic has led to a far-reaching evolution of substance abuse patterns; not less importantly, novel supply and demand channels have emerged, for which our surveillance/detection/screening frameworks may not yet be ready or completely suitable. The monitoring of web-based marketplaces and social media can potentially constitute a valuable tool in terms of keeping in check emerging substances, given the fact that many interactions between traffickers and buyers have moved online as a result of the restrictions. The risk is considerable among adolescents who have been exposed to the cyber sphere for longer unsupervised hours during the pandemic<sup>74</sup> and should not be discounted<sup>75,76</sup>.

### ***Non-Drug-Related Addiction***

While the pandemic has affected substance and alcohol abuse trends in youths<sup>77,78</sup>, the development of various forms of addiction other than to substances or alcohol is also of concern<sup>79,80</sup>.

The strain of coping with restrictions has caused students to seek ways to connect and socialize in manners that may not be productive for optimal health<sup>81</sup>.

Smartphone and internet addiction have both been on the rise as major contributing factors to poor mental health outcomes for adolescents.

Screen time and online presence at abnormal levels, along with almost constant interactions

through various devices, may have a deep impact on the human psyche, especially in youngsters. Such trends are likely to stay even after the pandemic has ended. The alteration of self-perception finds fertile ground in the cyber sphere: a surge has, in fact, been reported<sup>82</sup> in patients pointing to their appearance online as a reason to seek care, and adolescents may be particularly vulnerable to such misperceptions. Maladaptive eating habits and disorders driven by body dissatisfaction have reportedly been on the rise. Fear of being negatively judged is indeed a core element of anxiety and consequent maladjustment from a social standpoint and has major effects on social distress, as shown by recent studies<sup>83</sup> on the subject. Body dysmorphia linked to negative body image arises from the way one sees and envisions themselves mentally. Those key elements ultimately shape what individuals perceive, or misperceive, and believe about their own physical attributes, for instance, how they feel about their height, weight, shape, and overall attractiveness. Remote interactions can further distort the appearance of someone already perceiving a self-body image in a distorted fashion. On the other hand, if a body image concern is based on unrealistic aspirations and distorted perceptions, resorting to cosmetic surgery is unlikely to be a viable solution. It is, therefore, of utmost importance to assist patients, especially youngsters, in coping with their distorted image rather than changing how they look through surgery<sup>84</sup>.

### **Mental Health Aftermath and Possible Impact on Youth Crime**

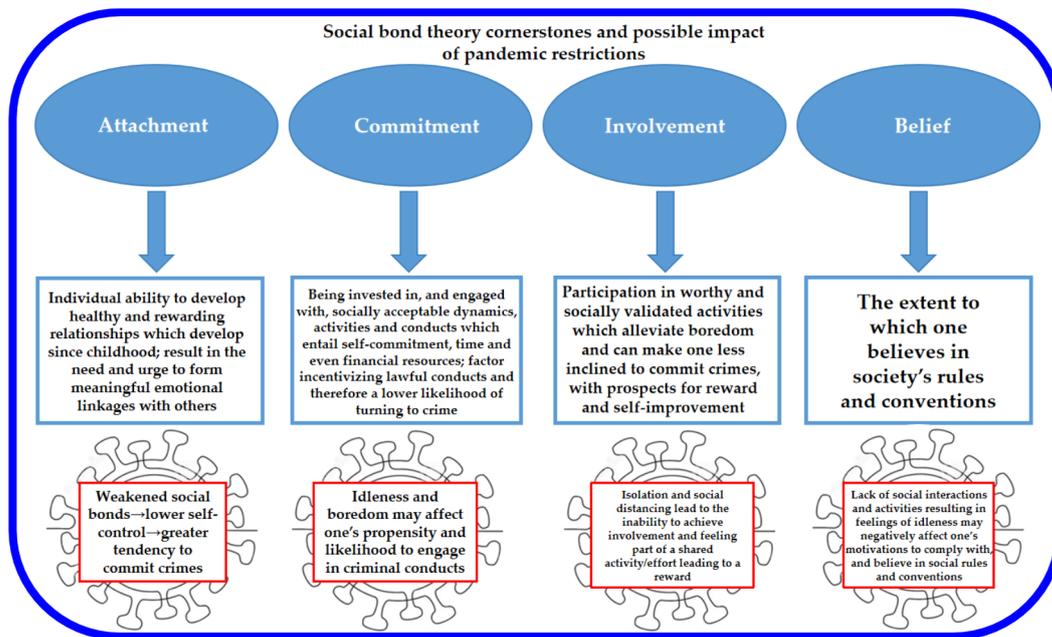
Considering the diverse dynamics discussed thus far, it is essential to recognize the potential emergence of new trends in drug abuse and anomalies in behavioral patterns. These, in turn, could impact the rates of youth crime. Although a relatively large number of studies<sup>85-87</sup> have focused on overall crime rates during and after the pandemic, there is still a dearth of conclusive scientific evidence to thoroughly shed light on such a possibility. Nonetheless, it is certainly worth exploring how such a correlation could play out in terms of its linkage to underlying determining and contributing factors. As discussed earlier, the pandemic has weighed heavily on family relationships and affected almost all forms of interactions among peers<sup>88-91</sup>. In that regard, it is worth mentioning the social bond theory and its cor-

nerstones, as the pandemic upsets have certainly affected such elements of stability, participation, and growth in the lives of millions of adolescents, and such outcomes may have a bearing on the propensity to develop substance addiction and/or engage in criminal acts. The theory, outlined by American criminologist Travis Hirschi<sup>92-94</sup> in the late 1960s, posits that offending behavior may be caused by weakened or broken social bonds with law-abiding people and institutions<sup>95-108</sup>. Figure 1 summarizes the theory's fundamental pillars, their distinctive features, and how pandemic restrictions have affected such dynamics.

Though it is certainly too early to draw conclusions at this stage<sup>104</sup>, ongoing research and in-depth investigation into how the pandemic has affected youth's ability to implement the principles briefly outlined above, and whether (and to what extent) juvenile crime rates will be affected should be viewed as a priority<sup>105</sup>. In the absence of conclusive research at this point in time, it is worth mentioning law enforcement agencies, which have pointed to worrisome trends. Remarks based on data from Italian law enforcement, specifically the juvenile public criminal prosecutor of Milan<sup>106</sup>, have, in fact, denounced a growth in assaults and robberies perpetrated by juvenile groups following the lifting of pandemic restrictions, with an almost paradoxical tendency towards "wolf-pack" crimes. This *modus operandi*, in the eyes of the perpetrators, may be viewed as a means to "dilute" responsibility for one's own action within a group of culprits. Such incidents, the prosecutor noted, are largely underestimated, due to underreporting. Similarly, police statistics<sup>107</sup> from Australia also show a growing trend of juvenile crime over pre-pandemic levels (e.g. the number of charges of unlawful use of a motor vehicle against juveniles reportedly more than doubled in south-east Queensland). Such tendencies also have been denounced by the police and crime commissioner (PCC) for the West Midlands, England, who sounded the alarm regarding individuals lacking a clear vision of their future, the social unrest that can engender, and the danger that young people who saw disruption in their daily lives, particularly young boys, and have the urge to find places where they can belong and identify, may channel such needs towards violence<sup>108</sup>.

### **Guidelines to Provide Timely Care and Tailored Approaches**

Initiatives such as teen Mental Health First Aid (tMHFA), i.e., a universal mental health literacy,



**Figure 1.** Social bond theory cornerstones (first row), their distinctive features (second row), and the impact of pandemic restrictions which may lead to a higher propensity to commit crimes (bottom row).

stigma reduction, help-seeking, and suicide prevention program, have confirmed the need for prompt responses when tackling adolescent mental health issues<sup>109</sup> and addressing substance- and non-substance related behavioral addiction. Most recent research findings<sup>110</sup> seem to confirm that suicide-related behaviors over the course of the pandemic may have risen more than expected. Such data are based on long-term trend assessment of the prevalence of emotional dysregulation (e.g., the inability or impaired ability to regulate one's emotional dynamics, which may result in sadness, hopelessness, and anxiety) and suicidal ideation and attempts<sup>111</sup>. Still, an effective prevention strategy for suicide ideation and attempts (and the pandemic impact on such elements) will have to rely on broad-ranging epidemiologic studies<sup>110-112</sup>. tMHFA programs, implemented in classroom settings, have been designed to raise awareness and enhance knowledge among adolescents. The fundamental purpose is to enable them to recognize and better support their peers experiencing mental health and substance addiction issues. Researchers<sup>113</sup> at Johns Hopkins University Bloomberg School of Public Health have been vetting teens themselves about how they have been coping with the pandemic through a pilot and evaluation of the intervention program Teen Mental Health First Aid (MFA). Over 50% of those surveyed pointed to the pandemic response

creating major issues and hardships. More than 25% of students stated that they had experienced a “great deal” and 30% a “moderate amount” of major upsets, leading to or compounding stress and anxiety, while a sizeable subset pointed to a “great deal” (19%) or “moderate” (17%) increase in depression. Changes in sleep and eating patterns have also been widely reported. The most common post-pandemic mental symptoms have been reported to be anxiety, depression, increased ruminations, post-traumatic stress disorder, sleep disorders, and emotional reactions specific to COVID-19, for example, being quite worried about getting infected<sup>114</sup>.

Broad-ranging analyses of the COVID-19 pandemic's impact on youth mental health show how deeply it has affected young people's well-being and point to the need for further, more conclusive research data and findings with a high level of methodological quality to inform policy decisions. Ultimately, the most significant risk factors have been found<sup>115</sup> to be lack of regularity in daily activities, abnormal exposure to COVID-19 information and media, (a phenomenon generally known as infodemic, which, at the height of the pandemic, the World Health Assembly recognized as possibly harmful and in need of strict management), prior mental health problems, female sex, fear of COVID-19, eating disorders, lower physical activity. Research findings<sup>116</sup> seem to support

the potential of tMHFA to improve the students' quality and promptness of first aid towards their peers struck with depression and suicidal ideation and increase their confidence in providing assistance to others dealing with either depression or social anxiety. Also, such initiatives could encourage youngsters to open up about their own mental health issues, by developing positive attitudes towards seeking help from adults. In addition, and just as importantly, effective stigma reduction has also been reported<sup>117</sup> in students one year after the training began, although no improvement could be demonstrated in the quality of first aid interventions and initiatives for a peer with mental issues, or for those receiving help from a peer. Such a lack of progress may be ascribed to student discontinuation and related reduction in the size of the sample reporting first aid behaviors. Real, enduring improvements in mental health first aid behaviors by students towards their peers will, therefore, have to be scrutinized over longer periods of time in order to confirm and substantiate long-term benefits<sup>118,119</sup>. Research on the continuing effects of COVID-19 will be necessary as the situation continues to change, and effective prevention and treatment strategies will likely prove vital to meet the healthcare needs of millions. In that regard, already before the pandemic, the Italian Society of Childhood and Adolescence Neuropsychiatry (SINPIA) called attention to the issues relating to hospitalization and psychiatric emergencies in adolescence, which is not yet a national organizational priority, despite the regular alarm on the phenomenon and evidence pointing to an increase in the number of hospitalizations for mental disorders in minors. According to preliminary data<sup>120</sup> from the SINPIA, presented at the Giornata Mondiale per la Salute Mentale (World Mental Health Day), on 10<sup>th</sup> October 2022, the impact of the pandemic on the mental and physical health of children and adolescents and the mental well-being of minors have deteriorated by more than 10% globally, with rising levels of anger, boredom, concentration issues, a sense of loneliness, stress, sleep disorders.

The effects of the pandemic were even more serious for those who already had issues of related vulnerability, such as preexisting neuropsychic disorders, situations of social fragility and economic difficulties, overcrowding, inability to access electronic devices or reliable connections for online learning (digital device)<sup>121-125</sup>. Ultimately, it will be essential to acknowledge that the social, economic, and family realities in which youngsters live vary substantially. Hence a one-size-fits-all

approach is simply not an option; in this context, healthcare and legal professionals must assess and acknowledge the varying effects of the pandemic on young individuals and youth violence<sup>126</sup>. To that end, factors such as age, gender, place of residence, and socioeconomic features are key elements in the prevention of youth mental disorders, crime, and violence against the backdrop of the pandemic. A thorough and effective prevention strategy calls for multidisciplinary and synergistic efforts based on continuous youth engagement in crime prevention, as well as security and socio-economic development aspects, based on good governance, ownership, ethical values, and comprehensive and partnership approaches. School drop-out rates, reportedly on the rise as a result of the pandemic, will have to be addressed in no uncertain terms, as a cornerstone of every intervention aimed at meeting the novel needs of youths and families. How the pandemic has affected those already at risk and vulnerable prior to it has to be assessed. Such individuals are likely to see their conditions get worse due to rising inequalities, discrimination, and marginalization. In order to break such a dangerous downward spiral, which poses a major threat to our social fabric and economic prospects, we must all raise awareness of the need for novel strategies and investments in social preventive approaches, based on guaranteeing continuous and reliably accessible support services and options (tailored to the varying degrees of needs and urgency experienced by youths, families and all stakeholders involved) for the ultimate purpose of fostering positive youth development during and after the pandemic. Ill-defined, ineffective, and/or inadequately focused, adult-centered approaches will have to be reconfigured, and novel strategies will be needed to guarantee access to education, life skills development, jobs, and recreational and sports options for as many young people as possible, in addition to reinforcing parenting skills, all vital underpinnings of the well-being, sustainability, and livelihood of youngsters for the present and the future.

## Conclusions

Over the past 10 years, anxiety and depression have increased significantly among children and teenagers<sup>127</sup>. The pandemic and then the war, which generates concern and uncertainty about the future, have further accentuated this trend. During childhood and adolescence, a higher incidence of anxiety and mood disorders is reported<sup>117</sup>,

with evolution in post-traumatic disorders in as many as 30-40% of cases. According to SINPIA<sup>120</sup>, underestimating the impact of the consequences of COVID-19 on young individuals runs the risk of escalating a healthcare emergency into a comprehensive crisis, thereby endangering the rights of children and youth. That scenario is even more realistic considering the already troublesome situation in Italy and elsewhere in terms of human resources availability, services, and assistance organizations for childhood and adolescent neuropsychiatric disorders. Difficulties in accessing support services during the pandemic have certainly worsened this scenario. The sensible use of telepsychiatry could be a valuable tool enabling local psychological care services to implement and support those provided in person, even after closures and lockdowns have been eliminated. The use and further development of new technological tools have been supported by the American Psychological Association in light of several other challenges (economic turmoil due to high inflation and international instability) likely to compound our vulnerabilities even further<sup>128</sup>. In that regard, the European Society for Child and Adolescent Psychiatry (ESCAP)<sup>129</sup> Research Academy and Board launched the first of three planned surveys to evaluate the impact of the COVID-19 pandemic on child and adolescent psychiatry (CAP) services in Europe and the abilities of CAP centers to meet the new challenges brought on by the crisis. It was concluded that the effect of the pandemic on the organization of CAP services has been profound, although respondents had a rather positive perception of the capacity of their services to handle the crisis, which also made the introduction of new technologies, including telepsychiatry, more urgent<sup>130</sup>. Initiatives such as the tMHFA school-based training program to teach high school students how to identify and respond to signs of mental illness in their peers, are to be encouraged considering the beneficial effects reported and the potential applications to crises beyond the COVID-19 pandemic. Findings<sup>131</sup> currently emerging on the impact of the pandemic on post-adolescents (age 18-24) point to the risk that such consequences could affect the educational and economic status of thousands of young people, who may fail to develop their full potential if not adequately cared for and treated. Ultimately, it will also be essential to address healthcare access disparities and inequalities, in addition to contributing factors determining adverse experiences. A comprehensive examination and evaluation of these interrelated issues will significantly contribute to shaping in-

tervention plans within schools and communities, with the goal of promoting and safeguarding the health and psychological well-being of adolescents. With community support to provide coordinated, cross-sector programming, schools can foster connection and access to services that help students grapple with the adverse experiences that they were confronted with during the pandemic. Public health and healthcare professionals, communities, schools, families, and adolescents can use these findings to better understand how students' lives have been affected during the pandemic and what challenges need to be addressed to promote adolescent health and well-being during and after the pandemic. Moreover, ensuring access to mental health services for children and families will be vital, as will be the tackling of addiction in all forms and the new trends of drug consumption and trafficking; the pandemic could, in fact, represent an element of prodding and even a valuable opportunity to promote and enhance the integration of mental health care into medical settings, potentially playing a pivotal role in delivering timely front-line and comprehensive care. The elimination of stigma and misconceptions about mental illness is crucial, given the numerous untreated conditions resulting from such tendencies. This has implications for the health, social, and economic burden experienced by the community at large. Such objectives must be prioritized. Recommendations and guidelines by scientific societies should be viewed by legislators, regulators, and policy-makers as legally binding when formulating and implementing more effective mental healthcare strategies. Failure to live up to high scientific standards and evidence-based indications should be considered a dereliction of duty from a medicolegal standpoint, in light of the WHO constitutional precepts identifying mental health and well-being as part and parcel of the broader notion of health: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity"<sup>132</sup>. A fundamental implication of such a definition is that mental health should be viewed as more than just the absence of mental disorders or disabilities. In case of adverse outcomes and if malpractice litigation arises, the onus will be upon the professional to prove adherence to guidelines and best practices, especially under tort law statutes<sup>133-135</sup>. Such guidance needs to consider novel findings stemming from an unprecedented scenario such as the COVID-19 pandemic. To such an end, new sets of criteria for diagnosis, treatment, and prevention will have to be devised and

tailored to the novel conditions in order to ensure medicolegal tenability and avoid potentially harmful defensive medicine tendencies<sup>134</sup>. That is even more meaningful and true for adolescent patients, who, on account of their developmental stage, are even more vulnerable and exposed to extraordinary hardships and ordeals such as those brought about by the pandemic. Such evolving dynamics need to be closely monitored in order to find the most effective approaches to meet the mental health needs of young individuals and determine whether and how addiction and crime trends will change due to the psychological and mental health burden of the pandemic. Meeting the mental health needs of adolescents and preventing youth violence and crime will have to necessarily rely on a broad-ranging set of responses aimed at identifying and tackling the social and anthropological determinants of such phenomena, which have been influenced and reshaped by the pandemic. Income inequality, demographic and social upsets, and inadequate levels of social protection are all major contributing factors that need to be addressed by law- and policy-makers, healthcare professionals, and the education systems. Such approaches will have to account for the ongoing evolution of crime dynamics increasingly harnessing digital tools for criminal activity, i.e., the Deep Web for trafficking purposes and the provision of illegal goods and services (used in large part by youths)<sup>136,137</sup>, hence a fully multidisciplinary effort is absolutely non-negotiable at this point in time. Also, critical to reducing the immediate consequences of youth mental disorders and violence are improvements in pre-hospital and emergency care, including access to care. Such updated implementation criteria, supported and substantiated by evidence-based guidelines reflecting the distinctive features and traits of such unique challenges, will constitute a new medicolegal framework for effective care, in keeping with the core precepts of the already mentioned international treaties and national constitutional precepts, by which to uphold the fundamental human right to health.

#### Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

#### Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

#### Ethics Approval and Informed Consent

Not applicable.

#### Authors' Contributions

All authors contributed equally to this work.

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