



# Changes in Youth Mental Health, Psychological Wellbeing, and Substance Use During the COVID-19 Pandemic: A Rapid Review

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## Abstract

Since the onset of the COVID-19 pandemic, researchers around the world have made efforts to assess its impact on youth mental health; however, the breadth of this topic has impeded a clear assessment of pandemic outcomes. This study aimed to address this gap by reviewing changes in youth (age  $\leq 25$ ) mental health, psychological wellbeing, substance use, and the use or delivery of relevant services during the pandemic. PubMed and Embase were searched in May 2021 to conduct a rapid review of the literature. The results encompass 156 primary publications and are reported using a narrative synthesis. Studies of mental health ( $n=122$ ) and psychological wellbeing ( $n=28$ ) generally indicated poor outcomes in many settings. Publications regarding substance use ( $n=41$ ) noted overall declines or unchanged patterns. Studies of service delivery ( $n=12$ ) indicated a generally positive reception for helplines and telehealth, although some youth experienced difficulties accessing services. The findings indicate negative impacts of the pandemic on youth mental health, with mixed results for substance use. Services must support marginalized youth who lack access to telehealth.

**Keywords** Youth · Children · Adolescents · Mental health · Substance use · COVID-19

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## Introduction

Children, adolescents, and young adults may be particularly vulnerable to negative psychological effects of the COVID-19 pandemic; accordingly, there has been considerable primary research regarding youth mental health, psychological wellbeing, and substance use during this time. The breadth and diversity of this literature necessitates comprehensive reviews to synthesize findings. In this study, changes in youth mental health, psychological wellbeing, and substance use were examined, as well as the demand for and delivery of youth substance use and mental health services during the COVID-19 pandemic.

The pandemic context presents psychological and emotional challenges for children, adolescents, and young adults. In many settings, schools and universities have not been physically accessible during “surges,” and “stay-at-home” or “lockdown” periods disrupt the daily routines, physical activities, social lives, and educational progress of many children and young people (Lee, 2020; Van Lancker & Parolin, 2020). Due to their sensitive psychosocial developmental stage, children and adolescents may be particularly vulnerable to the psychological distress resulting from these changes

with the potential for long-term consequences (CDC, 2019; Gruber et al., 2021; Racine et al., 2020). Indeed, children demonstrated symptoms of post-traumatic stress disorder (PTSD) in the wake of previous epidemics (Sprang & Silman, 2013), and initial evidence suggests that the COVID-19 pandemic has been a traumatic experience for some young people (Conti et al., 2020; Ruff & Linville, 2021). Anxiety disorders and high levels of stress are associated with increased alcohol use among adults (Keyes et al., 2012; Paltell et al., 2020), and this risk may be exacerbated among youth due to limited mechanisms of resilience and coping that develop with adulthood, thereby potentiating avoidant coping strategies such as substance use (Bartel et al., 2020; Dumas et al., 2020; Jones et al., 2021). These psychological challenges are particularly worrisome as youth mental health and substance use problems predict lifelong mental and physical health outcomes (Caspi et al., 2006; Hemmingsson et al., 2008; Merline et al., 2004).

The literatures on traumatic or stressful events suggests that youth with pre-existing mental health or substance use problems may be particularly vulnerable to psychological stress and negative coping strategies during the pandemic (Zijlmans et al., 2021). For example, in the aftermath of the 9/11 World Trade Center terrorist attack, New York City high school students who reported prior trauma and PTSD were more likely to increase cigarette smoking than were other students (Wu et al., 2006). Similar types of issues may be particularly relevant in the context of school closures (Lee, 2020), as school-based support services have been shown to improve youth clinical and academic outcomes for youth with mental health problems (Kang-Yi et al., 2018; Owens et al., 2008). Schools have also been shown to serve as important entry points for children needing mental health resources (Farmer et al., 2003; Merikangas et al., 2011). Pandemic-related stress may also be exacerbated among marginalized youth populations (e.g., youth who are racialized, LGBTQ2S+, housing-insecure/homeless, or maltreated), who already experience higher rates of social stress (Valentine & Shipherd, 2018) and have worse health outcomes (Jones et al., 2020), and lower rates of service utilization (Banks, 2021) as compared to the general youth population. The pandemic context may also engender additional barriers to care as services are physically inaccessible or insufficiently staffed (Bagley et al., 2021; Cohen & Bosk, 2020; Jones et al., 2020).

Much of the work on youth mental health, psychological wellbeing, and substance use during the pandemic has been focused on current mental health status rather than change relative to pre-pandemic outcomes (Al Omari et al., 2020; Turner et al., 2021; Zhou et al., 2020; Zijlmans et al., 2021). Similarly, previous reviews of youth mental health have included studies that lack a pre-pandemic comparator (Imran et al., 2020; Jones et al., 2021;

Nearchou et al., 2020; Nobari et al., 2021; Oliveira et al., 2020; Panda et al., 2021; Racine et al., 2020; Singh et al., 2020; Stavridou et al., 2020). Both primary and secondary findings may therefore reflect longstanding issues rather than newly emergent ones. Studies of changes in mental health problems are likely to be more useful than one-time assessments in order to understand and offset the negative impacts of this global phenomenon.

## Current Study

This rapid review provides a synthesis of the evidence concerning changes in essential developmental outcomes among youth, including those related to mental health, psychological wellbeing, substance use, and the use and delivery of relevant services, from prior to the pandemic until May 2021. Given the psychological difficulties associated with the pandemic context, reports of negative impacts of the pandemic were expected, including declines in mental health, decreases in psychological wellbeing, increases in substance use, and difficulty accessing services.

The streamlined approach of a rapid review was adopted given the dynamic nature of the ongoing COVID-19 pandemic. Comparisons of rapid reviews and systematic reviews on the same topic vary in their conclusions regarding the similarity of findings between the two approaches (Marshall et al., 2019; Reynen et al., 2018). However, Marshall et al. (2019) note that where quantitative precision is of reduced importance (relative to, for example, reviews completed to inform clinical guidelines or pharmaceutical registration), rapid reviews are an acceptable alternative to systematic reviews (Marshall et al., 2019). The findings of this review were not expected to be amenable to quantitative synthesis; therefore, a rapid review approach was selected.

## Method

This review is registered with PROSPERO (registration no. CRD42021254675, [https://www.crd.york.ac.uk/prospero/display\\_record.php?RecordID=254675](https://www.crd.york.ac.uk/prospero/display_record.php?RecordID=254675)). To maintain methodological quality, the design of the review was informed by the Selecting Approaches for Rapid Reviews (STARR) tool (Pandor et al., 2019), and several key aspects of systematic reviews, such as double screening of literature, were retained. To enhance critical appraisal and reproducibility of this work, reporting is in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Page et al., 2021) (see Online Appendix Table 5).

## Population of Interest

“Youth” was defined as anyone under 25 years of age in order to report findings among children, adolescents, and young adults (WHO, 2011).

## Outcomes

Data on changes in substance use, mental health outcomes, and service delivery in the context of the COVID-19 pandemic were extracted. “Mental health” included mental disorders (e.g., mood and anxiety disorders), as well as sub-clinical psychological distress and well-being. “Substance use” was inclusive of any substance, including alcohol, nicotine, cannabis, prescribed medicines used extra-medically, and illicit drugs. Specific outcomes were:

1. Onset, improvement, or worsening of a mental disorder or psychological distress
2. Improvement or worsening of psychological wellbeing
3. Changes in prevalence or incidence of a mental disorder or psychological distress
4. Onset or changes in frequency or amount of substance use
5. Changes in substances used or in route of administration of substances
6. Changes in prevalence or incidence of substance use or substance use disorder
7. Changes in access to or disruption of mental health or substance use services for youth

## Search Strategy

Searches of peer-reviewed literature regarding youth mental health, substance use, and wellbeing in the context of the COVID-19 pandemic were undertaken in PubMed and Embase in May 2021, restricted to studies published in 2020 onwards. The search strategy was designed to facilitate rapid completion while ensuring a high level of retrieval of relevant studies. Search terms are listed in the Online Appendix.

## Inclusion Criteria

All of the empirical studies on target outcomes were included, regardless of methodology. Inclusion criteria included (1) a focus on youth and (2) associations between any aspect of the COVID-19 pandemic and the specified outcomes. Primary publications and systematic reviews were included. Publications regarding mental health, psychological wellbeing, or substance use during the

pandemic without any comparison to a pre-pandemic time point (whether assessed prospectively or cross-sectionally) were excluded.

Population studies with any participants older than 25 were included if (1) age-disaggregated results for the age range of interest were reported or (2) the majority of the sample was younger than 25, as indicated by the mean and standard deviation of participants’ ages (e.g., in a sample of undergraduate students). Publications that only included youth with a specific health condition were excluded, unless the condition was a mental health problem.

## Study Selection

Study selection and screening were completed using the Covidence platform. Each citation was reviewed independently by two reviewers, with disagreements over inclusion and exclusion resolved through team discussion to reach a consensus. Reference lists of the included studies were checked for additional studies for inclusion.

## Risk of Bias Assessment

In keeping with a rapid review approach, a formal tool-based risk of bias assessment was not conducted. In rapid reviews with no formal risk of bias assessments, the ways in which bias may have been introduced to the findings need to be addressed (Pandor et al., 2019). To this end, data were extracted on several important aspects of the study design (e.g., prospective or retrospective assessment of change) and study population (e.g., representativeness of the study sample) that provide an indication of risk of bias. Summary statistics for these study design indicators are reported in Table 1 and used to highlight limitations in the literature.

## Data Extraction and Synthesis

Data were extracted into a Microsoft Excel spreadsheet to record: (a) study bibliographic details: authors, year of publication, country of publication; (b) study design: qualitative, quantitative, or mixed methods; the method of assessing change since the pandemic; recruitment method; prospective or retrospective recruitment; (c) study population: age range and average age of participants (child/adolescent/youth); generalizability of sample; and (d) study outcomes of interest and findings relating to youth substance use, mental health, wellbeing, and/or service delivery during the pandemic.

To maximize efficiency, the data from each study were extracted once, with verification by another team member. Given the broad scope of this review and the heterogeneity of included publications, a narrative synthesis approach was used, with results organized by substances

**Table 1** Included study designs

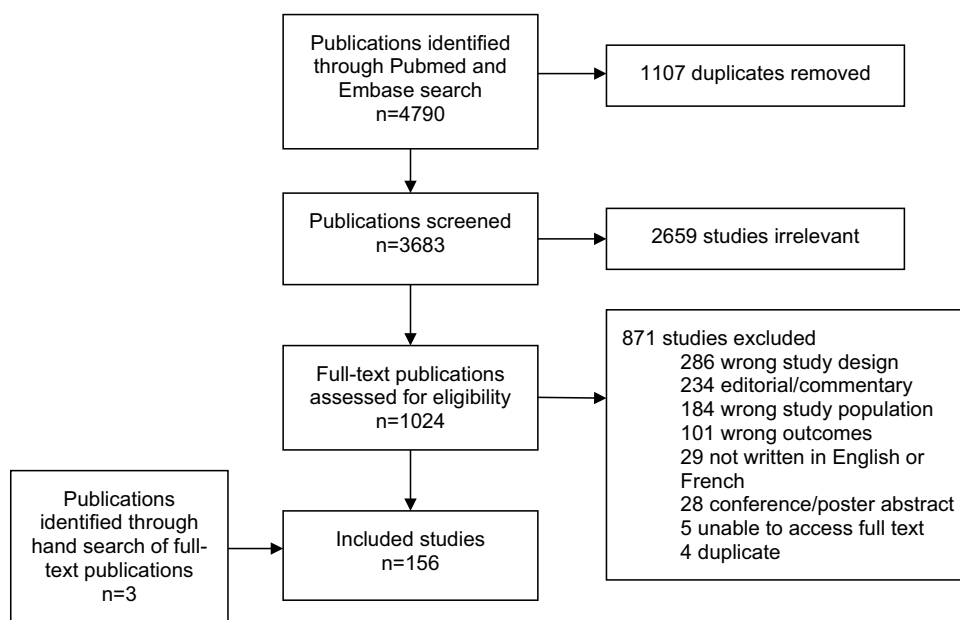
Assessment of change: all studies	<i>N</i> (%)	Sample age range: all studies	<i>N</i> (%)
Retrospective (cross-sectional or qualitative)	72 (46%)	Includes ages $\leq 5$	19 (12%)
Prospective (longitudinal)	44 (28%)	Lower limit: ages 6–9; upper limit: up to age 18	20 (13%)
Comparison to pre-pandemic norms	40 (25%)	Lower limit: ages 10–12; upper limit: up to age 18	17 (11%)
		Lower limit: ages 13–16; upper limit: ages 18–25	65 (42%)
		Young adults: ages 18–25	28 (18%)
		Age range not reported	32 (21%)
Assessment of change: studies of youth mental health	<i>N</i> (%)	Assessment of change: studies of youth psychological wellbeing	<i>N</i> (%)
Retrospective (cross-sectional or qualitative)	53 (43%)	Retrospective (cross-sectional or qualitative)	14 (50%)
Prospective (longitudinal)	37 (30%)	Prospective (longitudinal)	8 (29%)
Comparison to pre-pandemic norms	32 (26%)	Comparison to pre-pandemic norms	6 (21%)
Assessment of change: studies of youth substance use	<i>N</i> (%)	Assessment of change: studies of related services	<i>N</i> (%)
Retrospective (cross-sectional or qualitative)	26 (63%)	Retrospective (cross-sectional or qualitative)	6 (50%)
Prospective (longitudinal)	7 (17%)	Prospective (longitudinal)	0
Comparison to pre-pandemic norms	8 (20%)	Comparison to pre-pandemic norms	6 (50%)

or symptoms measured. The synthesis is focused on results from longitudinal studies, though studies using other designs are also drawn upon.

## Results

### Overview of Included Studies

The searches resulted in 4793 publications identified for screening: 4790 from the web searches, and three additional publications through hand searching of reference lists.

**Fig. 1** Study flow diagram

After screening and full-text review, 156 publications were included, all of which involved primary research (Fig. 1; see Online Appendix Tables 1–4).

The publications varied in their assessments of change and included many subsets of youth (Table 1). With a few exceptions, recruitment was generally based on convenience samples or drawn from ongoing longitudinal study cohorts. Sample sizes also varied widely ( $M = 1484$ ,  $Med = 308$ ), from small-scale qualitative studies to large population-based surveys. This heterogeneity of approaches precludes quantitative conclusions, but can offer an overall picture of the early pandemic's effects on youth wellbeing. The following sections are organized around broad areas of interest: mental health, psychological wellbeing, substance use, and related services. Within each section and subsection, preference has been given to the findings from longitudinal cohort studies, although notable discrepancies in the findings based on study design were not observed.

### Changes in Youth Mental Health During the COVID-19 Pandemic

One hundred and twenty-two publications were focused on changes in youth mental health during the COVID-19 pandemic (Table 1, Online Appendix Table 1). Most studies ( $n = 113$ , 93%) were conducted in high-income countries, from multiple world regions including Europe ( $n = 50$ ), North America ( $n = 39$ ), East Asia ( $n = 14$ ), Australasia ( $n = 7$ ), and Southwest Asia ( $n = 3$ ). Nine publications were from lower-income countries, namely Bangladesh, India, Iraq, South Africa, Turkey, and Uganda. Participant groups varied widely, including 31 publications (24%) conducted among student populations, with other studies including clinical populations, online survey respondents, and the general population. Age ranges also varied, including children younger than 5 years (as reported on by their parents), school-aged children, adolescents, college and university students, and young adults (see Table 1). Differences between age groups were only studied rarely, but there was some evidence that children younger than five exhibited fewer behavioral changes than their elder counterparts (Conti et al., 2020; Giménez-Dasí et al., 2020; Leeb et al., 2020).

#### Depression or Mood Disorder Symptoms ( $n = 57$ )

The evidence from the majority of included publications (79%) indicated that depression or depressive symptoms worsened during the pandemic as compared to the pre-pandemic period. Of the 20 longitudinal studies, increased depressive symptoms during the pandemic were reported in 16 (Bignardi et al., 2020; Breaux et al., 2021; Buckner et al., 2021; Chen et al., 2021a, b; Elmer et al., 2020; Evans et al.,

2021; Giuntella et al., 2021; Hawes et al., 2021a, b; Huckins et al., 2020; Husson et al., 2021; Li et al., 2021a, b; Magson et al., 2021; Yang et al., 2021; Zhang et al., 2020), no significant change in two (Janssen et al., 2020; Teng et al., 2021), and a reduction of depressive symptoms in two (Li et al., 2020; Xiang et al., 2020). Greater increases in mood disorder symptoms were reported among girls and young women as compared to their male counterparts in five studies (Elmer et al., 2020; Hawes et al., 2021a; Magson et al., 2021; Mastorci et al., 2021; Thorisdottir et al., 2021). In contrast, in a study in Bangladesh, parents reported more emotional problems among girls than among boys before the pandemic, but prevalence reached near parity 3 months after the imposition of physical distancing measures in March 2020 (Mallik & Radwan, 2021). Indian youth in a qualitative study described feeling hopeless, that life was meaningless during the pandemic, and that they had lost sleep and interest in activities (Suhail et al., 2020).

#### Anxiety or Anxiety Disorder Symptoms ( $n = 57$ )

Heightened anxiety in the pandemic period was reported in the majority of the publications (76%). Among the 21 longitudinal studies, higher levels of anxiety were reported in 16 (Breaux et al., 2021; Chen, et al., 2021a, b; Conti et al., 2020; Elmer et al., 2020; Evans et al., 2021; Hawes et al., 2021a, b; Huckins et al., 2020; Knowles & Olatunji, 2021; Li et al., 2021a, b; Magson et al., 2021; Manjareeka & Pathak, 2020; Teng et al., 2021), no significant change in two (Buckner et al., 2021; Zhang et al., 2020), and significant decreases in anxiety in three (Bignardi et al., 2020; Li et al., 2020; Schwartz-Lifshitz et al., 2021). Young women demonstrated larger increases in anxiety symptoms than young men in two studies (Elmer et al., 2020; Magson et al., 2021). In a qualitative study, South African youth discussed anxiety about the social isolation and monotony of the early pandemic period, as well as of their uncertain academic and social futures (Gittings et al., 2021).

#### Stress or Distress ( $n = 33$ )

Similar to the findings regarding depression and anxiety, 23 of the included publications (70%) indicated higher levels of stress or psychological stress among youth during the pandemic as compared to the pre-pandemic period. Among the nine longitudinal studies on these problems, higher levels of (dis)stress were reported in six (Baliyan et al., 2021; Breaux et al., 2021; Elmer et al., 2020; Gray et al., 2020; Magson et al., 2021; Savage et al., 2020), and no significant changes in two (Copeland et al., 2021; Munasinghe et al., 2020). An additional publication indicated a decrease in “acute stress” (but increases in depression and anxiety symptoms) among Chinese college students (Li et al., 2021a, b); only



one longitudinal study reported decreased tension among a sample of Dutch adolescents during March and April 2020 (Van de Groep et al., 2020). Worse stress trajectories were reported for female students as compared to their male counterparts in a Swiss study (Elmer et al., 2020).

### Externalizing Behaviors ( $n = 24$ )

Externalizing behaviors include hyperactivity, inattention, agitation, opposition/defiance, and interpersonal aggression. Increases in externalizing behavior during the pandemic period were reported in 16 studies (67%), no significant changes in 6 (25%), and reductions in 2 (8%). Of the eight longitudinal studies, two indicated an overall worsening of symptoms (Copeland et al., 2021; Hussong et al., 2021), two indicated no overall change (Bailey et al., 2021; Ezepeleta et al., 2020), and two indicated reductions in externalizing behavior (Achterberg et al., 2021; Penner et al., 2021). A longitudinal study of adolescents with and without diagnoses of Attention Deficit Hyperactivity Disorder (ADHD) in the United States indicated significant increases in inattention but no change in hyperactivity (Breux et al., 2021). Additionally, a study of Italian children and adolescents with ADHD indicated different trends for youth with mild- or moderate-severity ADHD (whose symptoms generally improved during the pandemic) than those with high-severity ADHD (who demonstrated increases in boredom, temper tantrums, argumentativeness, and aggression; (Melegari et al., 2021).

### Self-harm or Suicide ( $n = 14$ )

Publications from the United States, China, Australia, and Greece indicated increases in suicidal ideation during the pandemic as compared to the pre-pandemic period (Batchelor et al., 2021; Hill et al., 2021; Kaparounaki et al., 2020; Raviv et al., 2021; Son et al., 2020; Zhang et al., 2020). In Japan, no significant change was noted in the suicide rate among youth between March and May 2020 when compared to previous years (Isumi et al., 2020), but the monthly suicide rate among people younger than 20 increased by 49% from July to October 2020 (Tanaka & Okamoto, 2021). In contrast, a study of youth detained by the criminal legal system in Australia indicated a four-fold reduction in self-harming incidents during the pandemic compared to the same period in 2019, which the authors attributed to a coordinated and trauma-informed response by Youth Justice Centre staff, including the provision of sensory diversion packs, well-being checks, art-based activities, and family video-visits (Kasinathan et al., 2021).

## Changes in Youth Wellbeing and Resilience During the COVID-19 Pandemic

Twenty-eight publications were focused on youth wellbeing, life satisfaction, quality of life, resilience, and/or coping strategies during the COVID-19 pandemic (Table 1, Online Appendix Table 2). Most of the studies were conducted in high-income countries, with 14 from Europe, 10 from North America, three from Australasia, and one from South Africa. Samples generally included adolescents aged 13–18 years, although school-age children, college or university students, and vulnerable subgroups, such as youth in foster care (Vallejo-Slocker et al., 2020) or sexual and gender minority adolescents (Nelson et al., 2020; O'Brien et al., 2021), were also assessed.

### Wellbeing, Life Satisfaction, or Quality of Life ( $n = 21$ )

Of seven longitudinal studies of youth wellbeing or life satisfaction, six indicated a statistically significant worsening during the pandemic as compared to the pre-pandemic period (Ehrler et al., 2021; Evans et al., 2021; Gray et al., 2020; Magson et al., 2021; Mastorci et al., 2021; Savage et al., 2020). Nine of 11 cross-sectional studies also indicated lower levels of wellbeing or life satisfaction, while two indicated no significant changes. Greater decreases in wellbeing or life satisfaction among girls as compared with boys were reported in three studies (Magson et al., 2021; Mastorci et al., 2021; Thorisdottir et al., 2021). In a qualitative study, young people in the UK attributed their feelings of frustration, anger, and disappointment to the constant change, uncertainly, and lack of control associated with the pandemic context (Scott et al., 2021).

### Resilience and Coping Strategies ( $n = 8$ )

Despite qualitative reports of more negative than positive psychological impacts of school closure, adolescents demonstrated resilience and some positive coping strategies (Banks, 2021; Branquinho et al., 2020). These strategies included staying connected to others and maintaining positivity (Waselewski et al., 2020), as well as exercising, going outdoors, and engaging in creative pursuits (O'Brien et al., 2021). In a longitudinal study in the United States, youth who engaged in problem-focused coping experienced fewer mental health symptoms during the pandemic (Hussong et al., 2021).

## Changes in Youth Substance Use During the COVID-19 Pandemic

Forty-one publications included reports on youth substance use during the pandemic (Table 1, Online Appendix

Table 3). Most of the studies ( $n = 39$ , 95%) were conducted in high-income countries, generally in North America ( $n = 23$ ) and Europe ( $n = 13$ ), as well as one in each of Australia, Hong Kong, and Saudi Arabia. Two publications were from lower-income countries, Pakistan and Uganda. The participants were adolescents and young adults, generally ranging in age from 13 to 24. The populations varied, with 17 of the 41 publications (41%) sampling secondary or higher education students; a few studies were focused on people who use alcohol (Callinan et al., 2020) or other substances (Bonar et al., 2021a, b), or on marginalized youth subgroups, such as unhoused (Tucker et al., 2020) or sexual and gender minority young adults (Cerezo et al., 2021).

#### Alcohol ( $n = 24$ )

Fifteen publications (63%) included reports of declines in alcohol use during the pandemic as compared to the pre-pandemic period, including reductions in consumption prevalence (Bourion-Bedes et al., 2021; Evans et al., 2021; Ryerson et al., 2021; Tavoracci et al., 2021; Thorisdottir et al., 2021), frequency (Bonar et al., 2021b; Szajnoga et al., 2020), and quantity (Jaffe et al., 2021; Mohler-Kuo et al., 2021; Niedzwiedz et al., 2021; Steffen et al., 2021; White et al., 2020), as well as lower average scores on the Alcohol Use Disorders Identification Test (AUDIT; (Callinan et al., 2020). In contrast, six studies (25%) included reports of increased alcohol consumption (Charles et al., 2021; Coakley et al., 2021; Sharma et al., 2020; Znazen et al., 2021), increased Emergency Department admissions for alcohol intoxication among youth in Italy (Grigoletto et al., 2020), and qualitative evidence that social media drinking games normalized alcohol consumption among university students in California, USA, during school closure (Cerezo et al., 2021). In a study of Canadian high school students, different behavioral changes for overall alcohol use as compared to binge drinking were found approximately 3 weeks after Canadians were encouraged to engage in physical distancing. The students who consumed alcohol reported drinking more frequently, although the overall prevalence of alcohol use remained unchanged. In contrast, binge drinking was less prevalent during this period, but the students who continued to binge drink did so at the same rate (Dumas et al., 2020). Three additional publications (13%) indicated no changes in alcohol consumption measures (Bonar et al., 2021b; Chaffee et al., 2021; Husky et al., 2020). In an Australian study, young women decreased their drinking more than did young men during the pandemic period (Callinan et al., 2020); among French university students, in contrast, young women were more likely than young men to report no changes in their binge drinking (Tavoracci et al., 2021).

#### Nicotine ( $n = 17$ )

Fourteen publications (82%) revealed either overall declines (Dumas et al., 2020; Gaiha et al., 2020; Kreslake et al., 2021; Niedzwiedz et al., 2021; Sharma et al., 2020; Sokolovsky et al., 2021; Tavoracci et al., 2021; Thorisdottir et al., 2021; Tucker et al., 2020) or no change in the prevalence and frequency of nicotine consumption among youth during the pandemic as compared to the pre-pandemic period (Bonar et al., 2021a, b; Bourion-Bedes et al., 2021; Chaffee et al., 2021; Hopkins & Al-Hamdani, 2020; Matovu et al., 2021). Nearly half of the American young adults participating in a longitudinal study reported reducing their e-cigarette use during the pandemic, although about a quarter of the respondents reported increasing their use (Kreslake et al., 2021). A smoking cessation phone service in Hong Kong reported that 83% of callers changed their smoking habits during the pandemic, with 43% citing the pandemic as their motivation to quit (Ho et al., 2020). The overall prevalence of tobacco smoking was found to increase in only two publications (12%), both of which surveyed university students (Ahmed et al., 2020; Znazen et al., 2021). The pattern of overall decline or stability held for all nicotine products, including e-cigarettes and vapes.

#### Cannabis ( $n = 10$ )

Three publications indicated overall declines (Palamar et al., 2021; Tavoracci et al., 2021; Tucker et al., 2020) and two indicated no significant overall change (Chaffee et al., 2021; Liébana-Presa et al., 2020) in the prevalence or frequency of cannabis consumption among youth in the pandemic period, with only one study indicating increased cannabis consumption frequency among the majority of participants (Bonar et al., 2021a, b). However, the findings were mixed within studies. For example, roughly equal proportions of young adults in the Midwestern US reported increasing and decreasing their cannabis consumption during the pandemic (Sharma et al., 2020). Similarly, in a study of Canadian high school students, the prevalence of cannabis use decreased during the pandemic, although youth who continued to use cannabis reported doing so more frequently (Dumas et al., 2020). Among French university students, young men were more likely to report both increases and reductions in their cannabis consumption, while young women's usage remained unchanged; the authors attribute these differences to distinct social contexts of cannabis use for men and women (Tavoracci et al., 2021).

#### Other Drugs or Unspecified Substance Use ( $n = 9$ )

Seven publications were focused on changes in use across substances during the pandemic as compared to

the pre-pandemic period. While university students in the southeastern United States reported no significant changes to their use of substances other than alcohol (Charles et al., 2021), increases in both the number of substances used and the frequency of use were found in a longitudinal study of high school students in the United States (Cho et al., 2021). In qualitative studies in both the United States and Portugal, adolescents reported using alcohol or other drugs as a form of escapism during the early pandemic period (Branquinho et al., 2020; O'Brien et al., 2021).

Only two publications specifically were focused on substances other than alcohol, nicotine, and cannabis. Partygoers in New York City tended to reduce their use of cocaine, ecstasy, and LSD during COVID-related social distancing (Palamar et al., 2021). In contrast, in the state of Ohio, overdose deaths among people aged 24 years and younger in May 2020 were more than twice as high as the May 2018–2019 mean (42 vs 20 deaths, respectively; (Currie et al., 2021). Most of these overdoses involved opioids, the use of which was not reported in the other publications.

### Changes in Youth Substance Use or Mental Health Services During the COVID-19 Pandemic

Twelve publications focused on service use or delivery for youth during the COVID-19 pandemic (Table 1, Online Appendix Table 4). All 12 publications were conducted in high-income countries, with six from the United States ( $n=6$ ), two from Australia, and one each from Canada, France, Hong Kong, and the United Kingdom. The participants in these studies were often those seeking or receiving services, including primary mental health care (Nicholas et al., 2021), emergency psychiatric services (Ferrando et al., 2021; Leeb et al., 2020), and smoking cessation support (Ho et al., 2020). Many studies were focused on youth with pre-existing mental health conditions (Hawke et al., 2020; Ligus et al., 2021), such as ADHD (Becker et al., 2020; Bobo et al., 2020), and were generally conducted among adolescent or young adult populations, although two included younger children (Batchelor et al., 2021; Bobo et al., 2020).

### Substance Use Service Demand and Delivery ( $n=2$ )

Two publications were focused on substance use services during the pandemic. A study of youth accessing a smoking cessation phone line in Hong Kong indicated an increase in call volume during the pandemic (Ho et al., 2020). In a cross-sectional study of Canadian youth, 5% of the sample reported needing substance use services but not receiving them during the pandemic (Hawke et al., 2020).

### Mental Health Service Demand ( $n=5$ )

Demand for mental healthcare showed mixed effects of the pandemic. In Melbourne, Australia, overall use of primary mental health services decreased, but among those who accessed services, rates of attendance increased (Nicholas et al., 2021). Additionally, the Australian Kids Helpline received more online contacts than in previous years, many of which were related to mental health concerns. This increase in demand was sharper among young women than young men (Batchelor et al., 2021). In the United States, overall volume of children's mental health-related emergency department visits decreased (Ferrando et al., 2021; Leeb et al., 2020), but the proportion of emergency department visits for mental health-related concerns increased beginning in late-March to October 2020 relative to the same period in 2019 (Leeb et al., 2020).

### Mental Health Service Delivery ( $n=7$ )

Some youth reported difficulty maintaining access to mental health counseling or supportive therapies during the pandemic (Becker et al., 2020; Ligus et al., 2021). However, for clinical services that were able to transition, telehealth was generally positively received by youth and their caregivers despite difficulties with internet connectivity and other technical issues (Bobo et al., 2020; Nicholas et al., 2021). These technological barriers to access are more likely to affect disadvantaged youth, as was reported by Black adolescents in North Carolina (Banks, 2021).

## Discussion

Due to their developmental stage, children, adolescents, and young adults may be at particular risk for mental and emotional health impacts of the COVID-19 pandemic (CDC, 2019). A wide-ranging body of literature has been produced regarding youth mental health, psychological wellbeing, and substance use during the pandemic, including some systematic reviews. This is the first review, however, to be focused specifically on changes in these outcomes during the pandemic. Almost half of the included publications reported on cross-sectional studies, limiting their ability to infer causal mechanisms of change. However, 44 longitudinal studies were also reviewed, and the overall findings did not differ significantly between retrospective and prospective assessments of change. This narrative synthesis of 156 primary publications demonstrated significant mental health and psychological wellbeing impacts, although the effects on youth substance use were less clear.

The body of evidence derived from a variety of national, cultural, and economic contexts indicated the potential



for serious mental health problems among youth during the pandemic. However, findings varied both within and between mental health problem categories. While most longitudinal studies of depression symptoms, anxiety symptoms, and stress indicated increases during the pandemic, no change and even decreases in these problems were also noted. Increases in suicidal ideation and attempts in various countries were reported, but in one of the few studies of a marginalized youth subgroup, a significant reduction in self-harming incidents during the pandemic was reported, potentially attributable to the response of Youth Justice Centre staff (Kasinathan et al., 2021). In most cases, youth reported decreased wellbeing and life satisfaction during the pandemic, although some studies found no significant changes. Some of these declines may have been buffered by youth resilience and the employment of positive coping strategies (Hussong et al., 2021; Van de Groep et al., 2020).

Patterns of overall declines in mental health are likely due to numerous facets of the COVID-19 pandemic, including direct health-related concerns and the indirect effects of public safety restrictions and economic disruptions. For example, in a longitudinal study of Swiss university students, pandemic-related worries, social isolation, lack of emotional support, and physical isolation were all associated with negative mental health trajectories (Elmer et al., 2020). Different aspects of the pandemic context likely engendered distinct mental health problems. For example, among students in New York City, school concerns (e.g., online classes being of lower quality) were associated with increased depression symptoms, while home confinement concerns (e.g., experiencing “cabin fever”) were associated with increased generalized anxiety symptoms (Hawes et al., 2021a).

Family context played an important role during the pandemic period, when many families spent more time together. For example, in a Dutch longitudinal study, negative familial coping strategies and parental irritability/frustration put children at greater risk of increased stress during the early pandemic period (Achterberg et al., 2021). Similarly, “dysfunctional parenting” was a significant factor in Spanish children’s worsening mental health (Ezpeleta et al., 2020), and conflict with parents predicted increases in mental health problems among Australian adolescents (Magson et al., 2021). Better family functioning was related to fewer mental health concerns among a majority Hispanic/Latinx sample of US adolescents, suggesting that the protective effect of more family time may be especially salient for Latinx youths due to the cultural value of familism (Penner et al., 2021). All of these findings support the well-established tenet that children’s coping is affected by the quality of their family relationships (Masten & Narayan, 2012). Despite concerns (Gruber et al., 2021) and reports (Lee, 2020; Oliveira et al., 2020) of increased domestic violence

during home confinement periods, the issue was not reported on by included publications. This may be attributable to the mostly self- or parental-report format of the included studies, which may obscure intrafamilial violence.

Among adolescents, the importance of peer relationships and peer support was also highlighted (Rogers et al., 2021), particularly for adolescent girls (Elmer et al., 2020; Magson et al., 2021; Thorisdottir et al., 2021). In several settings, girls and young women reported greater negative psychological impacts of the pandemic than did boys and young men (Elmer et al., 2020; Hawes et al., 2021a; Magson et al., 2021; Mastorci et al., 2021; Thorisdottir et al., 2021), and the disruption of social networks due to school closures and physical distancing measures was cited as a factor. Adolescent girls may also have been exposed to more pandemic-related stressors (Hawes et al., 2021a), such as being tasked with taking care of younger siblings. Hormonal influences may also have made adolescent girls more sensitive stress (Thorisdottir et al., 2021), which potentiates internalizing problems among girls and women (Hawes et al., 2021a; Magson et al., 2021).

Disruption to young people’s daily lives was evident in their academic experiences and in time spent outdoors. The widespread transition to virtual schooling varied by setting. Online learning difficulties predicted increases in mental health problems among Australian adolescents (Magson et al., 2021). However, findings from a study of Chinese schoolchildren indicated both a smooth transition to virtual instruction and that the home environment was less stressful than that of school (Xiang et al., 2020). Decreased physical activity and increased Internet use were also reported as important pandemic effects (Chaffee et al., 2021; Mohler-Kuo et al., 2021; Munasinghe et al., 2020; Teng et al., 2021), and several studies cited these factors as potentially predictive of poorer mental health (Chen et al., 2021a, b; Ezpeleta et al., 2020; Giuntella et al., 2021). Although longitudinal evidence from US college students suggested that disrupted physical activity is a primary risk factor for depression, a short-term activity intervention did not improve mental health, highlighting the potential long-term health implications of the pandemic period (Giuntella et al., 2021).

Clear differences in mental health effects of the pandemic on young people of different ages or developmental stages were generally not found, other than potentially fewer negative ramifications for children younger than 5 years old (Conti et al., 2020; Giménez-Dasí et al., 2020; Leeb et al., 2020). In a longitudinal study in the UK, an overall increase in depression scores among school-aged children did not differ on the basis of age (Bignardi et al., 2020). The influence of age may also be confounded by contextual factors such as public health policies that vary by jurisdiction. For example, schools in Iceland continued in person for younger adolescents while older adolescents switched to

online instruction (Thorisdottir et al., 2021). Lack of clear age-related trends, however, should not obscure the fact that the isolation incurred by “lockdown” or “stay-at-home” measures may be particularly detrimental to children’s mental health due to their developmental stage (Bignardi et al., 2020).

Contrary to concerns that youth would increase their substance use during the pandemic, findings regarding substance use were mixed. A similarly divergent pattern of both increased and decreased consumption were recently reported among racial/ethnic minority college students in the US (Hicks et al., 2022), and the overall picture of decreased or stable use is supported by a recent US National Institutes of Health report of large declines in adolescent substance use in 2021 (NIDA, 2021). The impact of the pandemic on substance use has likely been moderated by a variety of factors, including changes to the social context in which young people normally use and have the opportunity to use substances. In-person social interaction has been dramatically reduced in many settings; for college and university student groups, a reduction in peer interaction tended to reduce alcohol use (White et al., 2020). However, social isolation may also serve to increase the use of other substances. In a longitudinal study in Canada, youth who were self-isolating used more cannabis during stay-at-home measures than did those who continued to socialize in person (Bartel et al., 2020).

Perhaps unsurprisingly, the importance of service engagement, particularly service continuity, was highlighted. For example, among University of Connecticut undergraduate students, disruption of mental health care was significantly associated with increased stress, distress, anxiety, and depression (Ligus et al., 2021). In contrast, students at the University of Vermont who were enrolled in campus wellness program reported small but significant improvements in internalizing problems and mitigated attention problems compared to their unenrolled peers (Copeland et al., 2021). The ability of services to maintain contact with youth clients during the pandemic period varied by setting, with greater difficulties reported in Canada (Hawke et al., 2020) and the US (Becker et al., 2020) than in the UK (Dewa et al., 2021). However, these distinctions are based on single studies and further research is necessary to understand service adaptations to the pandemic over the longer term.

### **Monitoring Risk and Preventing Harm, Particularly among Marginalized Youth**

The pandemic context presents numerous stressful elements, from health anxiety to the social isolation engendered by protective public health measures. Children and adolescents developing in stressful environments often experience poor mental health (Boe et al., 2018; Uddin et al., 2020), which is predictive of mental health problems

in adulthood (Caspi et al., 2006; Hemmingsson et al., 2008; Merline et al., 2004). Ongoing longitudinal studies will be needed to monitor lingering effects on youth at different developmental stages. In particular, the pandemic has disproportionately affected marginalized peoples (Blake et al., 2021), yet many of these populations remained “invisible” in the findings. The initial impetus for this study was to review publications regarding Indigenous youth. However, that initiative was stymied when searches resulted in only two relevant publications, neither of which reported primary research (Jones et al., 2020; Walker et al., 2021). Similarly, the use of substances other than alcohol, nicotine, and cannabis were assessed in very few publications. When other substances were included, the proportion of participants reporting use was generally too small to analyze meaningfully. This disconnect speaks to the necessity of research focused on vulnerable subpopulations of youth, including Indigenous and other racial/ethnic minority youth, as well as youth who use illicit drugs.

Substance use and mental health problems may be exacerbated for youth who already experience inequality, marginalization, or mental health problems (Jones et al., 2020; Usher et al., 2020). Mental health decrements were heightened among youth with pre-existing diagnoses or high levels of stress (Baliyan et al., 2021; Breaux et al., 2021; Janssen et al., 2020; Li et al., 2020). In the United States, racial/ethnic and sexual minorities reported experiencing disproportionately worse mental health outcomes and elevated suicidal ideation during the pandemic (Czeisler et al., 2020, 2021); in the United Kingdom, Black-identified youth had the highest increased odds of experiencing poor mental health (Dewa et al., 2021). Families with lower levels of income in the US also experienced greater risk of decreased wellbeing (Feinberg et al., 2021).

The pandemic has made internet connectivity essential not only for youth social connection, but also to access information and health services, many of which have transitioned to telehealth models. A mostly positive reception for telehealth was noted, and at least one youth helpline service reported an increase in the use of its web-based services (Batchelor et al., 2021). However, telehealth and digital service access requires a reliable internet connection and the appropriate devices and spaces to facilitate a virtual appointment (Bagley et al., 2021; Walker et al., 2021). Services may also consider lower thresholds for in-person communication for vulnerable youth for whom telehealth access is limited (Jones et al., 2020) or who lack a safe, private space from which to engage with providers. Clinical guidelines for the provision of telehealth services should acknowledge the various barriers to telehealth and provide guidance on engaging with young people who lack access to necessary technology. Procedures are also needed to support assessment of whether

a young person is in an environment where they may safely disclose mental health or substance use concerns, and how to proceed if it is determined that this is not the case.

## Limitations

### Limitations of the Literature

The sudden onset of the COVID-19 pandemic necessitated the rapid production of research to assess and address outcomes, yielding a body of work that is often retrospective and lacking clear pre-pandemic comparators. Change during the pandemic context is difficult to assess with studies of prevalence collected at a single time point. Cross-sectional studies in which change was assessed retrospectively may be biased in ways that are not always predictable, as study participants may either idealise their mental health prior to the pandemic or minimise their pre-pandemic problems relative to current psychological distress. Either of these possibilities may impact study findings and lead to unknown over- or under-estimation of the extent of change. Some researchers attempted to address the problem of cross-sectionally assessing change by comparing measurements collected during the pandemic period to pre-pandemic norms, but sometimes these norms referred to populations that were distinctly different from their participant sample (e.g., of different nationalities), limiting the utility of the comparison. However, longitudinal cohorts were able to provide valuable information regarding mental health, psychological wellbeing, and substance use changes during the pandemic period [e.g., (Thorisdottir et al., 2021)].

Study samples were often recruited based on convenience, in the interest of assessing the impact of the pandemic as it progressed; university students were particularly well represented. Study samples therefore did not always represent the wider youth population. In some population studies, the findings for young people could not be separated from the larger adult population. Additionally, the literature lacks longitudinal studies on illicit substance use among youth and data regarding marginalized youth subpopulations.

### Limitations of the Review

A formal assessment of study quality was not conducted, and many of the studies were based on designs that limit the robustness of conclusions regarding change in the outcomes of interest. We have focused our synthesis on findings from longitudinal studies in an attempt to minimise this concern. A second potential limitation was the exclusion of publications in languages other than English or French. However, in a meta-epidemiological study of clinical reviews, (Nussbaumer-Streit et al., 2020) found

that the exclusion of non-English publications tends not to effect overall review conclusions, suggesting that this could be an acceptable strategy for rapid reviews.

## Conclusion

Researchers have produced a large amount of work regarding the impacts of the COVID-19 pandemic among youth populations; however, the literature does not always include comparisons to pre-pandemic indicators. In this rapid review, we synthesized the research on change in youth mental health, psychological wellbeing, substance use, and associated services during the pandemic period, with a focus on prospectively measured change. The findings highlight serious negative impacts of the COVID-19 pandemic on young people's mental health and psychological wellbeing in many settings, though the heterogeneity of included publications precluded an analysis of specific age groups or developmental stages. The findings regarding substance use were more mixed and largely limited to alcohol, nicotine, and cannabis, warranting continued research. Further research is necessary to elucidate pandemic impacts on vulnerable subpopulations of youth, including youth who use illicit drugs and ethnic/racial minority youth. Publications regarding service demand and delivery were limited, but the findings suggest that services will need to continue to adapt and innovate to support youth wellbeing in the context of a health crisis.

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## Declarations

**Conflict of interest** The authors report no conflict of interests.

**Preregistration** The study design was registered with PROSPERO (registration no. CRD42021254675). Available at: [https://www.crd.york.ac.uk/prospero/display\\_record.php?RecordID=254675](https://www.crd.york.ac.uk/prospero/display_record.php?RecordID=254675)

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