

# Effects of COVID-19 Restrictions on Childhood and Adolescent Mental Health: A Scoping Review

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## Summary Abstract

**Background:** Restrictions impacting mental health and well-being can affect many children and adolescents, and evidence is accumulating for the detrimental effects of the COVID-19 pandemic and its associated restrictions.

**Methods:** We undertook a scoping review and searched LitCovid, the WHO Covid-19 database, Google Scholar and bibliographies of retrieved articles for systemic reviews and NGO reports on mental health effects in children and adolescents during the COVID-19 period of restrictions.

**Results:** We found 17 systematic reviews (three preprints) and four reports. The last search date for the reviews was April 2021, and the number of included studies in the reviews ranged from four to 102. Pooled estimates report that nearly eight out of ten children and adolescents report worsening of behaviour or any psychological symptoms, or increased negative feelings due to the COVID-19 pandemic. School closures contributed to increased anxiety, loneliness and stress; negative emotions due to COVID-19 increased with the duration of school closures. Deteriorating mental health was found to be worse in females and older adolescents. Mental well-being protective factors include increasing socialization that provides for positive interactions and benefits for other people (prosocial behaviours), along with social connectedness based on experiences of feeling close and connected to others. The quality of the review evidence was judged to be moderate. Future high-quality longitudinal studies are required to assess the long-term impact of restrictions on child and adolescent mental health.

**Conclusion:** The evidence in this review shows that the overall impact of COVID-19 restrictions on children and adolescents' mental health and well-being is likely to be severe. Therefore, mental health should be a crucial consideration when introducing restrictive measures that increase social isolation for children and adolescents. Several reviews highlight the essential need to monitor the ongoing impact of mental health in children and the requirement for further long-term studies.

## **Introduction**

The prevalence of mental health issues amid the COVID-19 pandemic is higher than before the outbreak. [1] Globally, the pandemic has seen disruptions to daily life, including vital mental health, and as a consequence, has impacted young people's wellbeing. [2, 3, 4]

About half of all mental health disorders start by the age of 14 [5], and Article 3.1 of the Convention of Human Rights for Children states that 'in all actions concerning children undertaken by public institutions, the child's best interest shall be a primary consideration'. [6] Also, paediatricians have expressed concern about the consequences of school absences and the varied impacts of the pandemic on children and young people's mental health. [7]

Research evidence suggests that children's mental health should be a high priority [8] and that it is essential to curate existing knowledge to understand the extent of the problems to date.

We, therefore, undertook a scoping review to assess the current evidence from systematic reviews reporting mental health effects in children and adolescents during the COVID period of restrictions and supplement these findings with evidence from NGO reports collating primary data.

## **Methods**

We performed a rapid scoping review using a flexible framework for restricted systematic reviews. [9] We searched LitCovid, the WHO Covid-19 database, Google Scholar and bibliographies of retrieved articles for systematic review articles reporting mental health effects in children and adolescents during the COVID period of restrictions. We also included reports by national or international agencies that had original data.

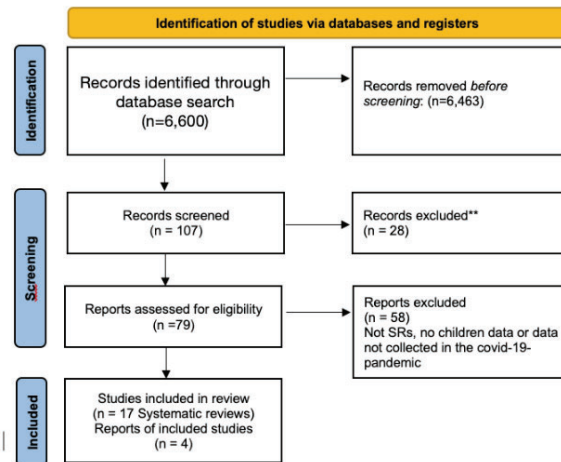
We reviewed the title and abstract, including systematic reviews and relevant Governmental and Non-Governmental Reports (NGO) reports that included primary data. We excluded studies of college and university students and reviews that did not include extractable data on children.

We extracted data on the outcomes, the number of included studies, the inclusion dates and the quality assessment. We tabulated the data and summarised the main findings and the quality of the evidence. We also provide recommendations, with an overall summary of the impact and the security of the evidence. Our review approach is available at Collateral Global: What is a Rapid Review? <https://collateralglobal.org/article/what-is-a-rapid-review/>

## **Results**

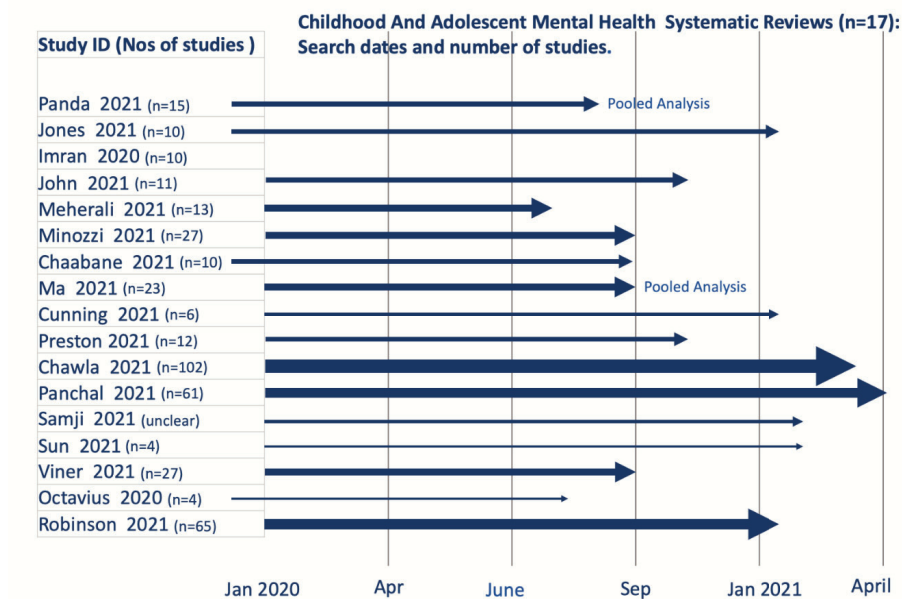
We identified 6,600 reviews, and of these, we assessed 79 full-text articles and included 17 systematic reviews reporting child and adolescent mental health (three were preprints [Robinson 2021, Viner 2021 and Sun 2021]) and four NGO reports [Save the Children 2020 OECD 2021 UK Children's Commissioner 2020 and UNICEF 2020].

Figure 1 Prisma Flow Chart Childhood Mental Health



The last search date for the reviews was April 2021; one review was published in 2020, and the other 16 in 2021. The number of included studies in the reviews ranged from four to 102. (see Figure 2). Two reviews, Panda 2021 and Ma 2021, undertook pooled analysis. The rest were descriptive reviews based on individual study findings. Chawla included the most studies (n=102): Electronic search identified studies through March 2021 reporting symptoms of psychological origin in children and adolescents. Most studies were conducted online or on the telephone, and the study designs were mainly cross-sectional (27 studies were done in China). The majority of studies assessed the prevalence of depressive and anxiety symptoms during COVID-19.

Figure 2:



Footnote: Line weights represent the number of included studies

## Quality of the evidence

Limitations in the evidence introduce uncertainty about the accuracy of the reported effects. In addition, there was considerable variation in outcome across studies, often due to the sampling methods, the outcome tools used to assess the psychological symptoms, and the timing of the studies in the pandemic.

Ma 2021 documented 18 mental health-related scales used to assess anxiety or depression, which significantly contributed to the heterogeneity. No long-term follow-up data were available, and studies often used cross-sectional designs that limited causal inference. Chawla 2021 reported almost no studies attempting to address potential bias. In nearly half the included studies, the authors had no discrete objectives and neglected to comment upon the generalizability of their findings.

## Study Impacts

Overall, we rated the impact as severe on mental health and well-being based on the following main findings: Anxiety, depression, irritability, boredom, inattention and fear of COVID-19 were predominant new-onset psychological problems in children during the pandemic [Panda 2020]. In addition, pandemics can cause stress, worry, helplessness, and social and risky behavioural problems among children and adolescents [Meherali 2021].

Thirteen studies report a negative association between the COVID-19 pandemic and its impact on mental health [Jones 2021]. Figure 3 shows that nearly eight out of ten children and adolescents report worsening behaviour/any psychological symptoms in a pooled analysis of fifteen cross-sectional studies (n=22 996 children/adolescents) [Panda 2020]. Original studies with or without comparator arms and a minimum sample of 50 were included in the analysis, and the pooled estimate was calculated using a random-effect meta-analysis. Of the 15 studies, ten were rated as fair quality, and five as good. Five were done in China, three in Italy (one was Italy and Spain) and one each in Bangladesh, Brazil, France, Hong Kong, India, Korea and Turkey.

**Figure 3**

**Panda 2020:** Psychological and Behavioral Impact of Lockdown and Quarantine Measures for COVID-19 Pandemic on Children, Adolescents and Caregivers Children: A systematic review of 15 cross-sectional studies (n=22,996 participants)

### Pooled estimates % (95% CI)

Anxiety 34.5% (33.8–35.1%)

Depression 41.7% (40.8–42.3%)

Irritability 42.3% (39.4–45.7%)

Boredom 35.2% (32.9–39.1%)

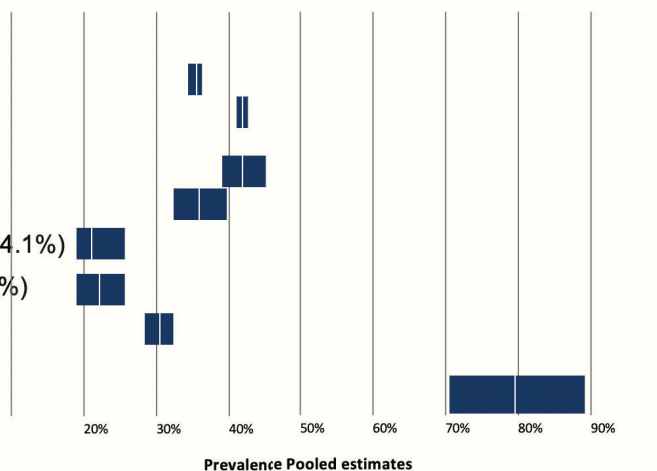
Sleep disturbance 21.3% (18.7–24.1%)

Excessive fear 22.5% (19.3–25.4%)

Inattention 30.8% (27.9–32.8%)

Worsening of behaviour/any  
psychological symptoms

79.4 % (71.8–88.3%)

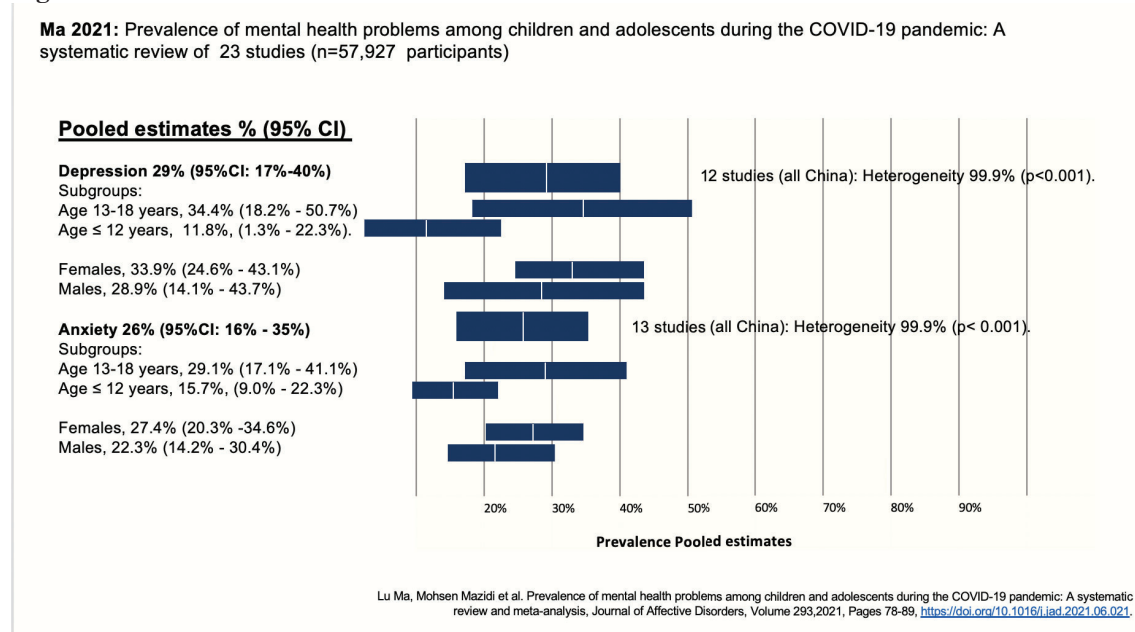


Psychological and Behavioral Impact of Lockdown and Quarantine Measures for COVID-19 Pandemic on Children, Adolescents and Caregivers: A Systematic Review and Meta-Analysis, *Journal of Tropical Pediatrics*, Volume 67, Issue 1, February 2021, fmaa122, <https://doi.org/10.1093/tropej/maa122>

Ma included 23 studies with 57,927 (search end date Sep 2020). Figure 4 shows reported pooled prevalence's among children and adolescents of depression of 29% (95%CI: 17%-40%); anxiety, 26% (95%CI: 16%-35%) and sleep disorders of 44% (95%CI: 21%-68%).

Depression 29% (95%CI: 17%-40%) 12 studies. Heterogeneity was high (I<sup>2</sup> 99.9%) and all were done in China. The prevalence of depression in those age 13-18 years was 34.4% (95%CI: 18.2%,- 50.7%) compared to 11.8% in those age ≤ 12 years (95%CI: 1.3%, 22.3%). The pooled prevalence of anxiety was 26% (95%CI: 16%-35%, I<sup>2</sup> 99.9%) reported in 13 studies (all done in China). In adolescents age 13-18 years anxiety prevalence was 29.1% (95% CI: 17.1%, 41.1%) compared to 15.7% in those ≤ 12 years (95%CI: 9.0%, 22.3%).

**Figure 4**



School closures as part of broader social distancing measures may be associated with considerable harm to the psychological health and wellbeing of children [Viner 2021]. School closure contributed to increased anxiety, loneliness, stress, sadness, frustration, indiscipline, and hyperactivity [Chaabane 2021]. Two reviews reported worsening mental health as more marked in females and older adolescents [Chawla 2021, Samji 2021]. Chawla et al. reported pooled prevalence of depression in females of 33.9% (95% CI: 24.6%-43.1%, p<0.001) compared to 28.9% in males (95%CI: 14.1%, 43.7%, p<0.001). The prevalence of anxiety if females was 27.4% (95%CI: 20.3%- 34.6%) compared to 22.3% in males (95%CI: 14.2% -30.4%)

Stressors for adolescents included the inability to see friends, arguments with parents, unresolvable disputes via social media, academic stress and feelings of isolation [John 2021]. Social connectedness (i.e., family connectedness, school connectedness, social support), self-esteem, and prosocial behaviours were the most common protective factors for social isolation [Preston 2021]. Parent-child communication is potentially protective for anxiety and depression [Panchal 2021]. However, the overall impact on suicide rates in children and adolescents remains uncertain [Minoozi 2021, Viner 2021].

## Reports

We included four reports that contained primary data (see Table 2). First, The UK Children's Commissioner 2020 assessed inpatient mental health wards during COVID-19. Briefing October 2020. The survey found that more than two-thirds of children's mental health wards - 71% - suspended family visits at some point between 23rd March and 31st May, while the rest continued

to allow visits to children. Second, the UNICEF 2020 report responding to the mental health and psychosocial impact of COVID-19 on children, and families reported that while the full implications and long-term fallout of COVID-19 remain to be seen, it is clear that restricted movement, closed schools, physical distancing, and fear of the disease are impacting the mental health and wellbeing of children, adolescents and caregivers.' Third, The Save the Children 2020 report highlighted the hidden impacts of COVID-19 on children's mental health: 83% of children reported increased negative feelings due to COVID-19 increased with the duration of school closures. Finally, the OECD 2021 report on supporting young people's mental health through the COVID-19 crisis highlighted that 'young people's (15-24 year-olds) mental health worsened significantly in 2020-21. Reporting in most countries, mental health issues among this age group have doubled or more.'

## **Discussion**

We found consistent evidence that anxiety and depression, along with fear of COVID-19, are predominant new-onset psychological problems in children during the pandemic [Panda 2020]. The pandemic has severely affected child and adolescent mental health [Jones 2020], as most studies show a worsening of psychological conditions, especially among adolescents. [Minozzi]

Evidence of the impact of the pandemic on suicidal behaviour is accumulating rapidly, and living reviews are assessing the evidence as new information emerges [John 2021]. Ongoing assessment is essential as long-term evidence is critical as the pandemic will likely have long term adverse consequences on children's and adolescents' mental health [Meherali 2021].

Our review findings highlight the need to identify children and adolescents at higher risk of mental health problems and provide support during times of need, such as school closures [Chaabane 2021]. Indeed, the impact on children's physical and psychological health from school closures should be accounted for in any decisions to restrict in-person education. [Viner 2021] Review evidence also shows that mental health problems may be more significant in females and adolescents [Ma 2021]. Furthermore, both the fear of the illness and social isolation are substantial contributors to psychological distress [Chawla]. Therefore, supporting the mental health needs of children and adolescents at risk is critical. [Panchal 2021] Review evidence further shows that prosocial behaviours and social connectedness can be protective, and interventions should be targeted at these issues.

## **Limitations**

The evidence from current studies shows several limitations. First, the data is primarily limited to 2020 and early 2021, and there is a need for further continual updates. We are therefore planning to update this scoping review.

Second, the sampling frames that rely on self-selected or convenience samples may overestimate the extent of the problems. Selection bias occurs when individuals in a study differ systematically from the population of interest, leading to systematic error in the outcome [10].

Third, taken together with the wide variation in outcome measures used that contribute to the heterogeneity, there is a need to standardize the questionnaires and the measures to provide accurate estimates and permit meaningful comparisons. For example, Ma et al. showed that in depression, the PHQ-9 (9-item Patient Health Questionnaire) and the CES-D (Center for Epidemiologic Studies Depression Scale) significantly contributed to heterogeneity. Similarly, in the analysis of anxiety, SCARED: Screen for Child Anxiety Related Emotional Disorders; SAS: Self-Rating Anxiety Scale and the PQSPHE: Psychological Questionnaire for Sudden Public Health Events questionnaires affected heterogeneity. Fourth, there are also issues with the generalisability of the results. In Ma et al., for instance, all the studies in the meta-analysis were done in China, limiting the findings' applicability to other countries. Many countries are not currently included in the retrieved reviews, which limits the generalisability.



The Save the Children survey on 'The Hidden Impacts of Covid-19 on Children's Mental Health' was implemented in 46 countries and resulted in the largest survey of children and parents during the pandemic to date, with 13,477 children aged between 11-17 years old participating. Such a survey could be extended to give a global perspective on mental health. Finally, future studies should consider the most appropriate scale, an appropriate length of follow-up, and whether random sampling would be more acceptable to obtain generalizable population estimates.

## **Conclusions**

The evidence in this review shows that the overall impact of COVID-19 restrictions on children and adolescents' mental health and wellbeing is likely to be severe. 'In all actions concerning children undertaken by public institutions, the child's best interest shall be a primary consideration' (Article 3.1 of the Convention of Human Rights for Children). Therefore, mental health should be a crucial consideration in deciding whether to increase social isolation and reduce prosocial behaviours for children and adolescents. Several studies highlight the essential need to monitor the ongoing impact of mental health in children and the requirement for further long-term studies.

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## **Ethics Committee Approval**

No approval was necessary.

## **Data Availability**

All data included in the review is provided in the

## **Funding**

This review received funding from Collateral Global. In addition, CH receives funding support from the NIHR SPCR.

## **Competing Interest Statement**

TJ was in receipt of a Cochrane Methods Innovations Fund grant to develop guidance on the use of regulatory data in Cochrane reviews (2015 to 2018). From 2014 to 2016, he was a member of three advisory boards for Boehringer Ingelheim. TJ is occasionally interviewed by market research companies about phase I or II pharmaceutical products for which he receives fees (current). TJ was a member of three advisory boards for Boehringer Ingelheim (2014 to 16). TJ was a member of an independent data monitoring committee for a Sanofi Pasteur clinical trial on an influenza vaccine (2015 to 2017). TJ is a relator in a False Claims Act lawsuit on behalf of the United States that involves sales of Tamiflu for pandemic stockpiling. If resolved in the United States favour, he would be entitled to a percentage of the recovery. TJ is coholder of a Laura and John Arnold Foundation grant for the development of a RIAT support centre (2017 to 2020) and Jean Monnet Network Grant, 2017 to 2020 for The Jean Monnet Health Law and Policy Network. TJ is an unpaid collaborator to the project Beyond Transparency in Pharmaceutical Research and Regulation led by Dalhousie University and funded by the Canadian Institutes of Health Research (2018 to 2022). TJ consulted for Illumina LLC on next-generation gene sequencing (2019 to 2020). TJ was the consultant scientific coordinator for the HTA Medical Technology programme of the Agenzia per i Servizi Sanitari Nazionali (AGENAS) of the Italian MoH (2007 to 2019). TJ is Director Medical Affairs for BC Solutions, a market access company for medical devices in Europe. TJ was funded by NIHR UK and the World Health Organization (WHO) to update Cochrane review A122, Physical Interventions to interrupt the spread of respiratory viruses. TJ is funded by Oxford University to carry out a living review on the transmission epidemiology of COVID 19. Since 2020, TJ receives fees for articles published by The Spectator and other media outlets. TJ is part of a review group carrying out a Living rapid literature review on the modes of transmission of SARS CoV 2 (WHO Registration 2020/1077093 0). He is a member of the WHO COVID 19 Infection Prevention and Control Research Working Group, for which he receives no funds. TJ is funded to co-author rapid reviews on

the impact of COVID restrictions by the Collateral Global Organisation. CJH holds grant funding from the NIHR, the NIHR School of Primary Care Research, the NIHR BRC Oxford and the World Health Organization for a series of Living rapid review on the modes of transmission of SARs-CoV-2 reference WHO registration No2020/1077093. He has received financial remuneration from an asbestos case and given legal advice on mesh and hormone pregnancy tests cases. He has received expenses and fees for his media work, including occasional payments from BBC Radio 4 Inside Health and The Spectator. He receives expenses for teaching EBM and is also paid for his GP work in NHS out of hours (contract Oxford Health NHS Foundation Trust). He has also received income from the publication of a series of toolkit books and appraising treatment recommendations in non-NHS settings. He is the Director of CEBM and is an NIHR Senior Investigator. He is co-director of the Global Centre for healthcare and Urbanization based at Kellogg College at Oxford, and he is a scientific advisor to Collateral Global. JB is a major shareholder in the Trip Database search engine ([www.tripdatabase.com](http://www.tripdatabase.com)) and an employee. In relation to this work, Trip has worked with many organizations over the years; none have any links with this work. Their main current projects are with AXA and Collateral Global

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[1,2,3 WHO 2021, Breslau 2021, Kane 2021]  
 [4 Kessler 2007], [5 Children's rights] [6 RCPCH 2020]  
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## Included Studies

Chaabane 2021

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<https://doi.org/10.3390/children8050415>

Chawla 2021

Chawla N, Tom A et al. Psychological Impact of COVID-19 on Children and Adolescents: A Systematic Review. *Indian Journal of Psychological Medicine*. 2021;43(4):294-299. doi:10.1177/02537176211021789

Cunning 2021

Cunning C, Hodes M. The COVID-19 pandemic and obsessive-compulsive disorder in young people: Systematic review. *Clinical Child Psychology and Psychiatry*. June 2021. doi:10.1177/13591045211028169

Imran 2020

Imran, N., Aamer, I., Sharif, M., Bodla, Z., & Naveed, S. (2020). Psychological burden of quarantine in children and adolescents: A rapid systematic review and proposed solutions. *Pakistan Journal of Medical Sciences*, 36(5). <https://doi.org/10.12669/pjms.36.5.3088>

John 2021

John A, Eyles E, Webb RT et al. The impact of the COVID-19 pandemic on self-harm and suicidal behaviour: update of living systematic review [version 2; peer review: 1 approved, 2 approved with reservations]. *F1000Research* 2021, 9:1097 (<https://doi.org/10.12688/f1000research.25522.2>)

Jones 2020

Jones, E.A.K.; Mitra, A.K.; Bhuiyan, A.R. Impact of COVID-19 on Mental Health in Adolescents: A Systematic Review. *Int. J. Environ. Res. Public Health* 2021, 18, 2470. <https://doi.org/10.3390/ijerph18052470>

Ma 2021

Lu Ma, Mohsen Mazidi et al. Prevalence of mental health problems among children and adolescents during the COVID-19 pandemic: A systematic review and meta-analysis, *Journal of Affective Disorders*, Volume 293, 2021, Pages 78-89, <https://doi.org/10.1016/j.jad.2021.06.021>.

Meherali 2021

Meherali, S. Punjani N et al. Mental Health of Children and Adolescents Amidst COVID-19 and Past Pandemics: A Rapid Systematic Review. *Int. J. Environ. Res. Public Health* 2021, 18, 3432. <https://doi.org/10.3390/ijerph18073432>

Minozzi 2021

Minozzi S, Saulle R et al. Impact of social distancing for covid-19 on the psychological well-being of young people: a systematic review of the literature. May 2021, Vol. 112, N. 5. *Recent Prog Med* 2021; 112 (5): 360-370 | doi 10.1701 / 3608.35873

Panchal 2021

Panchal, U., Salazar de Pablo, G., Franco, M. et al. The impact of COVID-19 lockdown on child and adolescent mental health: systematic review. *Eur Child Adolesc Psychiatry* (2021). <https://doi.org/10.1007/s00787-021-01856-w>

Panda 2021:

Prateek Kumar Panda, Juhi Gupta et al. Psychological and Behavioral Impact of Lockdown and Quarantine Measures for COVID-19 Pandemic on Children, Adolescents and Caregivers: A Systematic Review and Meta-Analysis, *Journal of Tropical Pediatrics*, Volume 67, Issue 1, February 2021, fmaa122, <https://doi.org/10.1093/tropej/fmaa122>

Preston 2021

Angela J. Preston, & Lynn Rew (2021) Connectedness, Self-Esteem, and Prosocial Behaviors Protect Adolescent Mental Health Following Social Isolation: A Systematic Review, Issues in Mental Health Nursing, DOI: 10.1080/01612840.2021.1948642

Robinson 2021

Eric Robinson, Angelina R. Sutin, et al. A systematic review and meta-analysis of longitudinal cohort studies comparing mental health before versus during the COVID-19 pandemic medRxiv 2021.03.04.21252921; doi: <https://doi.org/10.1101/2021.03.04.21252921>

Samji 2021

Samji, H., Wu, J., Ladak, A. et al. (2021), Review: Mental health impacts of the COVID-19 pandemic on children and youth – a systematic review. Child Adolesc Ment Health. <https://doi.org/10.1111/camh.12501>

Viner 2021

Russell Viner, Simon Russell et al. Impacts of school closures on physical and mental health of children and young people: a systematic review medRxiv 2021.02.10.21251526; doi: <https://doi.org/10.1101/2021.02.10.21251526>

Octavius 2020

Octavius, G.S., Silviani, F.R., Lesmandjaja, A. et al. Impact of COVID-19 on adolescents' mental health: a systematic review. Middle East Curr Psychiatry 27, 72 (2020). <https://doi.org/10.1186/s43045-020-00075-4>

### Included Reports

Save the Children 2020

The hidden impacts of covid-19 on children's mental health  
<https://www.savethechildren.net/blog/hidden-impacts-covid-19-children%E2%80%99s-mental-health>

OECD 2021

Supporting young people's mental health through the COVID-19 crisis (Link)  
<https://www.oecd.org/coronavirus/policy-responses/supporting-young-people-s-mental-health-through-the-covid-19-crisis-84e143e5/>

UK Children's Commissioner 2020

Inpatient mental health wards during Covid-19. Briefing October 2020  
<https://www.childrenscommissioner.gov.uk/wp-content/uploads/2020/10/cco-inpatient-mental-health-wards-during-covid-19.pdf>

UNICEF 2020

Responding to the mental health and psychosocial impact of COVID-19 on children and families  
<https://www.unicef.org/media/83951/file/MHPSS-UNICEF-Learning-brief.pdf>

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**Table 1 of Study Impacts and limitations**

| Study ID<br>(Author,<br>initials,<br>year) | Population and<br>nos of studies | Impact | Limitations |
|--|----------------------------------|--------|-------------|
|--|----------------------------------|--------|-------------|

|   |  |   |  |
|---|--|---|--|
| Panda PK 2021   | Children < 18 yrs.<br>15 cross-sectional studies (n=22,996)  | <b><u>Pooled estimates % (95% CI)</u></b><br>Anxiety 34.5% (33.8–35.1%)<br>Depression 41.7% (40.8–42.3%)<br>Irritability 42.3% (39.4–45.7%)<br>Boredom 35.2% (32.9–39.1%)<br>Sleep disturbance 21.3% (18.7–24.1%)<br>Excessive fear 22.5% (19.3–25.4%)<br>Inattention 30.8% (27.9–32.8%)<br>Overall worsening of behaviour/any psychological symptoms 79.4 % (71.8–88.3%)   | Ten studies were of fair quality, and five were of good quality. The certainty rating was of a moderate level. The parents were found to be suffering from stress and psychological problems and their perception might not be a true reflection.                              |
| Jones EAK 2021  | Adolescents<br>16 studies (n=40,078).  | 13 studies reported a negative association between the COVID-19 pandemic and its impact on mental health. Social support, positive coping skills, home quarantining, and parent-child discussions seem to positively impact mental health.  | None discussed   |
| Imran N 2020  | Children & adolescents,<br>10 studies (3 in COVID-19 period)   | Three studies reported restlessness, irritability, anxiety, clinginess and inattention with increased screen time in children during quarantine.  | Meta-analysis was not performed due to differences in the study designs, measurements tools and study outcomes. The psychological effects should be interpreted with caution as they could be due to the impact of disaster, disease or disaster containment measures or both. |
| John A 2021   | Adults or children of any ethnicities.<br>78 qualitative articles (64 cross-sectional surveys are excluded)<br>11 articles specifically focussed on children & young people. | <b>Isumi 2020</b> to May provided some reassurance about measures/school closures on suicide rates in children (<20 years) in Japan.<br><b>Tanaka &amp; Okamoto 2021</b> and <b>Ueda 2021</b> flagged a concerning rise amongst students and young (<40 yrs.) people, particularly females and children and adolescents during the 2nd wave and during school closures.<br><b>Zhang 2020</b> reported pre-pandemic comparison data, with increases seen in NSSI, suicidal thoughts, suicidal plans and suicide attempts in primary and secondary school children post-pandemic. <b>Jefsen 2020b</b> and <b>Jolly 2020</b> were case series that reported the stressors for adolescents that included the inability to see friends, arguments with parents, unresolvable arguments via social media, academic stress and feelings of isolation | There was a paucity of research focusing on reporting on ethnic minorities within populations, children and young people, the representativeness of the sample was challenging to assess.  |
| <ul style="list-style-type: none"> <li>Isumi A, Doi S, Yamaoka Y, <i>et al.</i>: Do suicide rates in children and adolescents change during school closure in Japan? The acute effect of the first wave of COVID-19 pandemic on child and adolescent mental health. <i>Child Abuse Negl.</i> 2020; <b>110</b>(Pt 2): 104680. <a href="#">Article Link</a></li> <li>Jefsen OH, Rohde <i>et al.</i>: Editorial Perspective: COVID-19 pandemic-related psychopathology in children and adolescents with mental illness. <i>J Child Psychol Psychiatry.</i> 2020b. <a href="#">Article Link</a></li> <li>Jolly TS, Batchelder E, Baweja R: Mental Health Crisis Secondary to COVID-19-Related Stress: A Case Series From a Child and Adolescent Inpatient Unit. <i>Prim care companion CNS disord.</i> 2020; <b>22</b>(5): 20102763. <a href="#">Article Link</a></li> <li>Tanaka T, Okamoto S: Increase in suicide following an initial decline during the COVID-19 pandemic in Japan. <i>Nat Hum Behav.</i> 2021; <b>5</b>(2): 229–238. <a href="#">Article Link</a></li> <li>Ueda M, Nordström R, Matsubayashi T: Suicide and mental health during the COVID-19 pandemic in Japan. <i>J Public Health (Oxf).</i> 2021; fdab113. <a href="#">Article Link</a></li> <li>Zhang L, Zhang D <i>et al.</i>: Assessment of mental health of Chinese primary school students before and after school closing and opening during the COVID-19 pandemic. <i>JAMA Netw Open.</i> 2020; <b>3</b>(9): e2021482. <a href="#">Article Link</a></li> </ul> |  |   |  |

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| Meherali S 2021 | School-age children & adolescents (5 to 19 yrs.) in LMICs<br><br>18 articles (13 COVID)                                       | Pandemics can cause stress, worry, helplessness, and social and risky behavioural problems among children and adolescents  | Heterogeneity in the outcome measures prevented meta-analyses. The majority of the studies were based on online self-reports and the studies cannot provide conclusions about the long-term impact   |
| Minozzi S 2021  | Young people: 64 studies, of which 27 assessed psychological well-being. Most were conducted in the UK (38%) and China (27%). | Two studies reported an increase in suicides and two a reduction in access to the psychiatric emergency room. The prevalence of anxiety in adolescents ranged from 19%-64% and depression from 22%-44%. In children aged 5-12, the prevalence of anxiety ranged from 19%-78% and depression from 6.3%-23%. In preschool children, some studies showed a worsening of behavioural and emotional disturbances while others showed no changes. In the UK, there was a non-significant increase in suicides compared with 2019. Similar results were reported in a Japanese study of aged <20 years and made a comparison between the months of March-May 2020 and the same months of 2018-2019. The UK study reported that 48% of deaths in 2020 were associated with the pandemic or restrictive measures. | 42% of the studies were judged to be of high quality. The main limitation is that all the studies included were conducted during the pandemic first wave. Most studies were cross-sectional and were unable to assess the long-term impact of restrictive measures and the cumulative effect of numerous sources of stress and anxiety, such as financial difficulties, loss of parental job, family conflicts or fear of illness. |
| Chaabane S 2021 | Child & Adolescents and school closures<br>10 studies   | School closure was associated with a significant decline in hospital admissions and pediatric emergency department visits. A number of children and adolescents lost access to school-based healthcare services, special services for children with disabilities and nutrition programs. Widening educational disparities due to lack of support and resources for remote learning were also reported among poorer families and children with disabilities. School closure contributed to increased anxiety and loneliness in young people and child stress, sadness, frustration, indiscipline, and hyperactivity.  | All included studies were observational and hence considered as low-level evidence. a limited number of studies are available reporting health consequences of the COVID-19 school closure, the psychological aspect seems to be the standout issue confronting child and adolescent health.   |
| Ma L 2021       | Children & adolescent.<br>23 studies (n= 57,927)  | <b>Pooled prevalence</b><br><b>Depression</b> 29% (95%CI, 17%-40%) 12 studies, (all China)<br><b>Sub-group</b><br>Depression age 13-18 years was 34% (18%-51%) higher than age ≤ 12 years, 12% (1.3%-22%).<br><b>Gender</b> showed depression in females at 34%, (25%- 43%) was higher than males at 29% (14%-44%)<br>Anxiety among children and adolescents was 26% (16%, 35%) 13 studies (all China)<br><b>Subgroup</b><br><b>Anxiety</b> in adolescents age 13-18 years was 29%, (17%-41%) higher than ≤ 12 years at 15.7% (9.0%- 22%).<br><b>Gender:</b> Anxiety of females was 27% (20%-35%) was higher than males at 22% (14%-30%).  | 18 mental health-related scales were used in the questionnaire for the assessment of anxiety or depression which significantly contributed to the Heterogeneity. All the studies in the meta-analysis were done in China. Most studies used an online survey method and nonprobability sampling, which further limit generalizability. Only two studies focused on children <6 years.  |

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| Cunning C 2021  | Young people <21<br>6 studies   | Five articles showed COVID-19 causing an increase in obsessive-compulsive symptoms in young people. The one which showed an improvement in symptoms was from a sample size of 29 subjects.   | The quality of the studies was poor. Due to the Heterogeneity of study characteristics and instruments used no meta-analysis was performed and no long-term follow-up was available.  |
| Preston AJ 2021 | Adolescents age 10-19 yrs.<br>12 studies                                  | Social connectedness (i.e., family connectedness, school connectedness, social support), self-esteem, and prosocial behaviours were the most common protective factors for social isolation.   | Six studies scored 7/8 and six studies scored 8/8 on the checklist (most reductions related to failure to explain controls for confounding variables). The studies were mainly developed countries.   |
| Chawla N 2021   | Children & Adolescents<br>102 studies                                     | Studies assessing emotional distress showed variable levels of anxiety and depressive symptoms, with greater severity among females and older adolescents. Reduced physical activity; delayed sleep time; increased sleep duration, screen time, internet use, and sedentary habits, poor quality of life often correlated with anxiety/depression.  | Almost none of the studies reported any attempts to address potential bias. In almost half of the included studies, the authors had not specified discrete objectives and failed to comment upon the generalizability of their findings.  |
| Panchal U 2021  | Children & adolescents<br>61 articles<br>(n=54,999 (mean age 11.3 yrs.)). | Anxiety symptoms: range 1.8–50%<br>Depression symptoms: 2.2–64%,<br>Irritability: 17–73%<br>Anger: 30–51%<br>Special needs and the presence of mental disorders before the lockdown, alongside excessive media exposure, were significant risk factors for anxiety. Parent-child communication was protective for anxiety and depression.  | Meta-analysis was not performed due to the heterogeneity of the outcomes and measurement methods. Some studies (62%) did not provide details about the duration of the lockdown.<br>Most studies (74%) were cross-sectional.  |
| Samji H 2021    | children & adolescents 116 articles<br>(n=127,923)                        | A high prevalence of COVID-19-related fear was noted, as well as depressive and anxious symptoms compared with pre-pandemic estimates. Older adolescents, girls, and those living with neurodiversity and/or chronic physical conditions were more likely to experience negative mental health outcomes. Physical exercise, access to entertainment, positive familial relationships, and social support were associated with better mental health outcomes. | Many studies were cross-sectional done during disparate restrictions (e.g., full lockdowns vs. settings of minimal restrictions). Several studies failed to separately report results for children and adolescents<br>Heterogeneity of populations, mental health outcomes, and the tools to assess impact prevented meta-analysis. |
| Sun Y 2021      | The general population,<br>36 studies<br>children<br>4 studies            | Two studies of children or adolescents (Magson 2021, Zhang 2020) did not find statistically significant differences in anxiety. The same two studies reported small statistically significant increases in depression among children and adolescents.  | Most studies had limitations related to study sampling frames and recruitment methods, response and follow-up rates, and management of missing follow-up data. Heterogeneity was high in most meta-analyses that we conducted. Third, only a handful of studies reported results from the fall months of 2020.                      |

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| <ul style="list-style-type: none"> <li>Magson NR, Freeman JY, Rapee RM, Richardson CE, Oar EL, Fardouly J. Risk and protective factors for prospective changes in adolescent mental health during the COVID-19 pandemic. <i>J Youth Adolesc</i> 2021;50:44–57. (<a href="#">Article Link</a>)</li> <li>Zhang L, Zhang D, Fang J, Wan Y, Tao F, Sun Y. Assessment of mental health of Chinese primary school students before and after school closing and opening during the COVID-19 pandemic. <i>JAMA Netw Open</i> 2020;3:e2021482. (<a href="#">Article Link</a>)</li> </ul>   |  |  |  |
| Viner R<br>2021   | <p>Aged 0-20 years.</p> <p>72 studies from 20 countries</p> <p>27 studies concerning mental health</p> | <p>27 studies concerning mental health identified impacts across emotional, behavioural and restlessness/inattention problems; Two studies reported non-significant rises in suicide rates. Self-harm and psychiatric attendances were markedly reduced, indicating a rise in unmet mental health needs. Child protection referrals fell 27-39%, with a halving of the expected number of referrals originating in schools.</p> <p>A high-quality national English cohort study found psychiatric inpatient admissions decreased by 40%, with large decreases in ED presentations for mental health reasons including self-harm.</p> <p>A high-quality US regional cohort study reported decreases in ED mental health presentations of just over 50%, with self-harm presentations reduced by 65% One pre-post study of English young people found improvements in mean anxiety scores during the lockdown, particularly in those with pre-existing high scores and in those with poorer relationships with the school.</p> | <p>63% were high-quality, 25% medium-quality and 13% low-quality.</p> <p>Studies were largely unable to reach or recruit new participants during the lockdown, hence the reliance on online self-report data collection from convenience studies. Many publications included only simple analyses which did not take account of potential confounders. Many studies used historical control periods, which in some failed to take account of seasonal variation. Studies using parent reports may have been biased No data on the impact of the degree of school closures.</p> |
| Octavius GS<br>2020   | <p>Adolescents 4 studies</p>   | <p>Three studies showed that COVID-19 was a risk factor for mental health problems in adolescents <b>Jiang 2020</b> reported the prevalence of mild-to-severe depressive and anxiety symptoms in Chinese adolescents during COVID-19 outbreak was 44% and 37% respectively.</p> <p><b>Qu 2020</b> before the pandemic, 52 % of adolescents reported depressive symptoms and 39% anxiety symptoms. After home confinement, the number dropped to 38% and 24% respectively (all <math>p &lt; 0.0001</math>). After Propensity Score Matching (PSM) matching, adolescents with exposure risk* still had more depression (61%) and anxiety symptoms (41%) than those without any exposure risks (46% and 29% respectively)</p> <p><b>Oosterhoff 2020</b> reported that adolescents who preferred to stay at home reported less anxiety and depressive symptoms. Seçer 2020 reported that fear of COVID-19 positively predicts emotional reactivity which positively predicts experiential avoidance and depression-anxiety.</p>  | <p>The studies did not measure any baseline characteristics except for Qu et al, Heterogeneity prevented meta-analysis. Recommends homogenous questionnaire</p>  |
| <ul style="list-style-type: none"> <li>Oosterhoff B, Palmer CA, et al. (2020) Adolescents' motivations to engage in social distancing during the COVID-19 pandemic: associations with mental and social health. <i>J Adolesc Health</i>; 67(2): 179-85.</li> <li>Seçer İ, Ulaş S (2020) An investigation of the effect of COVID-19 on OCD in youth in the context of emotional reactivity, experiential avoidance, depression and anxiety. <i>Int J Ment Heal Addict</i>:1–14.<a href="#">Article Link</a></li> <li>Qu M, Yang K, et al (2020) Mental health status of adolescents after family confinement during the COVID-19 outbreak. <i>Lancet</i>:1–17</li> <li>Jiang S, Li Z, Zhang et al (2020) Prevalence and socio-demographic correlates of psychological health problems in Chinese adolescents during the outbreak of COVID-19. <i>Eur Child Adolesc Psychiatry</i> 29:749–758 <a href="#">Article Link</a></li> </ul> |  |  |  |
| *Exposure risk was defined as anyone in the surrounding living environment of the participant who was infected with COVID-19.   |  |  |  |



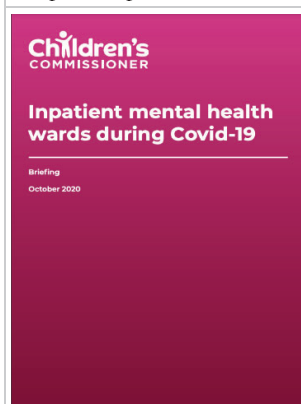
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| Samji H<br>2022 | General<br>65 articles (number<br>in children and<br>adolescents not<br>clear) | The initial outbreak of the pandemic was associated with a significant but statistically small increase in mental health symptoms. found no evidence that change in mental health symptoms differed based on age, gender, or study continent. | The majority of studies sampled populations in developed countries during the early stages of the pandemic. Heterogeneity tended to be high. Little evidence that study outcomes were strongly related to individual risk of bias indicators and in an analysis limited to relatively high-quality studies results were similar to the main analyses. The level of attrition was high |
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**Table 2. Reports**

### UK Children's Commissioner 2020

#### Inpatient mental health wards during Covid-19. Briefing October 2020 ([Link](#))

A survey was sent to all inpatient mental health wards in England for children between the 23rd March and 31st May 2020. Overall, Responses from 104 wards, two wards which responded were closed during the period analysis from the remaining 102 open wards. Of the wards which responded, 61 were NHS and 43 independent providers



'For some of the children, we spoke to, not having visits from their families was the most difficult part of lockdown.'

'Even when policies on visits became more flexible, children still faced restrictions – for example only one family member being allowed to visit at a time, and visits having to be socially distanced.'

'As one child said, it was hard knowing that: There was no association between whether there was at least one confirmed case of Covid-19 on the ward among children or staff (between 23rd March and 31st May) and whether the ward stopped visits from family.'

'The proportion of wards with a confirmed case – 47% - was the same in both wards which stopped visits and those that did not stop visits.'

Our survey found that more than two-thirds of children's mental health wards - 71% - suspended family visits at some point between 23rd March and 31st May, while the rest continued to allow visits to children.

### UNICEF 2020

#### Responding to the mental health and psychosocial impact of COVID-19 on children and families ([Link](#))

The research was implemented in 46 countries and results in a survey of children and families during the COVID-19 crisis to date, with 31,683 parents and caregivers and 13,477 children aged between 11-17 years old participating in the research.

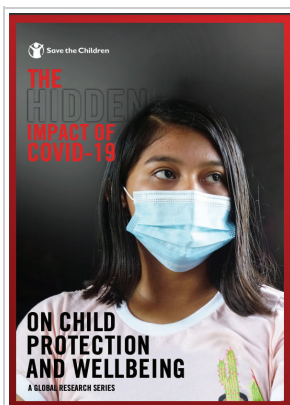


'While the full impact and long-term fallout of COVID-19 remain to be seen, it is clear that restricted movement, closed schools, physical distancing, and fear of the disease are impacting the mental health and wellbeing of children, adolescents and caregivers.'

### Save the Children 2020

#### The hidden impacts of COVID-19 on children's mental health ([Link](#))

The research implemented in 46 countries results in the largest and most comprehensive survey of children and families during the COVID-19 crisis to date, with 31,683 parents and caregivers and 13,477 children aged between 11-17 years old participating.



83% of children reported an increase in negative feelings, Negative feelings due to COVID-19 increased with the duration of school closures: 96% of children expressed increased negative feelings when schools closed for 17-19 weeks, compared to 62% closed for 1-4 weeks.

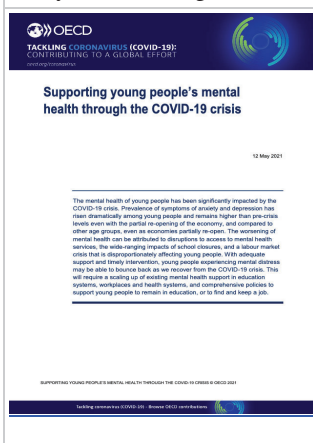
Children not in touch with friends reported feeling less happy (57%), more worried (54%) and less safe (58%). The few children able to interact with friends in person and virtually reported that they were less happy (5%), more worried (5%) and less safe (6%).

Those aged 15 to 17 years showed higher levels of change in negative feelings: 60% stated they were feeling less safe, compared to 48% aged 11–14 years and 54% felt less hopeful compared to 42% of younger children.

## OECD 2021

### Supporting young people's mental health through the COVID-19 crisis ([Link](#))

Policy brief including review of the evidence



Young people's (15-24 year-olds) mental health has worsened significantly in 2020-21. In most countries, mental health issues among this age group have doubled or more.

The uncertainties and broad impacts of COVID-19 have not affected all people to the same degree: young people were 30% to 80% more likely to report symptoms of depression or anxiety than adults in Belgium, France and the United States in March 2021. Higher levels of loneliness are also being reported by young people;

Mental health support for young people – notably in schools, universities and workplaces – has been heavily disrupted.