



Department
for Education

The impact of the COVID-19 pandemic on adolescent mental health

Research report

March 2022

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Summary

The impact of the COVID-19 pandemic on adolescent mental health is a widespread concern. However, to date, there is limited empirical evidence which can causally attribute changes to the pandemic. With the aim of overcoming some of the existing methodological limitations, the current study utilised a naturally occurring experiment within two ongoing school-based trials. Depressive symptoms, externalising difficulties (e.g., behaviour problems such as losing your temper or hitting out), and life satisfaction were assessed at baseline and 1-year follow-up across two groups. One group entered the study in phase 1 (2018; pre-COVID-19 group; N = 6,419) and were controls as they did not experience the COVID-19 pandemic between baseline and follow-up. The second group entered the study in phase 2 (2019; COVID-19 group; N = 5,031) and were exposed to the pandemic between baseline and follow-up, therefore providing a natural experiment.

Key Findings

- The COVID-19 pandemic led to increased adolescent depressive symptoms and decreased life satisfaction
- If the COVID-19 pandemic had not occurred, estimates suggest that we would observe 6% fewer adolescents with high depressive symptoms which is a difference of 1.6% in prevalence (27.1% to 25.4%)
- There was no overall effect of the COVID-19 pandemic on adolescent externalising difficulties
- Girls' mental health may have been more negatively impacted by the COVID-19 pandemic than boys

What we already know

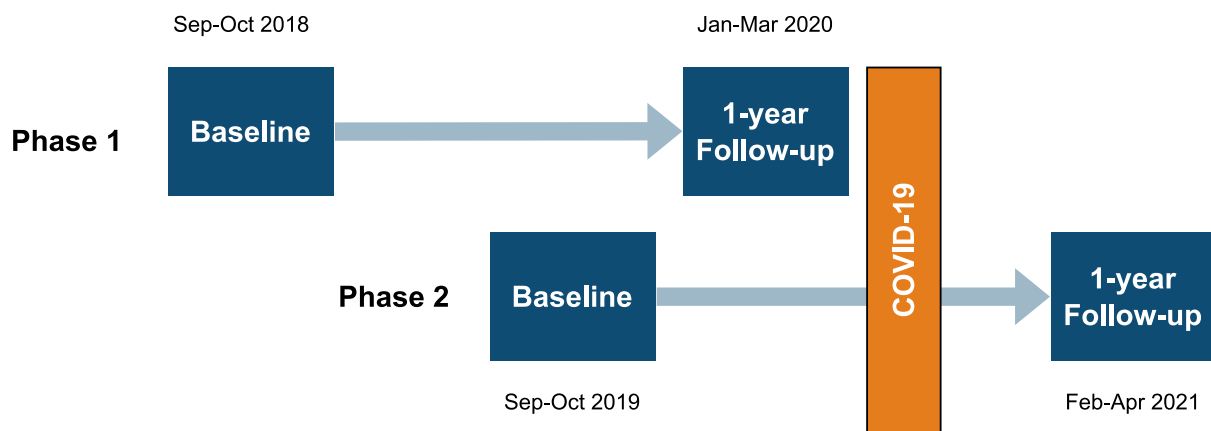
Rates of adolescent mental health difficulties were concerning prior to the COVID-19 pandemic, with approximately 14-17% of young people aged 11-19 meeting International Classification of Disease (ICD-10) diagnostic criteria for at least one mental disorder in England (1). Evidence suggests that adolescent mental health has deteriorated over time (2,3); it is therefore important to understand the impact of the COVID-19 pandemic beyond existing downward trends. Despite widespread concern about the pandemic's impact on adolescent mental health, there are limited empirical studies which can causally attribute changes in mental health to the COVID-19 crisis.

Methodological limitations in existing evidence include the lack of timely pre-pandemic scores for comparison, and covid-era online survey samples that are not representative

of the general adolescent population. The few longitudinal studies conducted in the UK still face the challenge of differentiating between known patterns of mental health difficulties in adolescence and the impact of the pandemic. For example, internalising difficulties (e.g., emotional difficulties such as depressive or anxiety symptoms) increase year-on-year during this stage of life and have been increasing across time. Worsened mental health during the pandemic could therefore be explained by trends that would already have existed.

With the aim of overcoming some of the existing methodological limitations, the current study utilised a naturally occurring experiment within two ongoing, Department for Education funded, trials (see the Education for Wellbeing Programme trial protocols; 4,5). As one of the largest school-based trials of mental health interventions in the UK, it was necessary to recruit schools in two phases (see Figure 1). Phase 1 schools completed their baseline surveys in September - October 2018 and the 1-year follow-up between January - March 2020. They were therefore not exposed to the COVID-19 pandemic. Phase 2 schools completed their baseline surveys in the same months in 2019 and the 1-year follow-up between February - April 2021. This group were therefore exposed to the COVID-19 pandemic between baseline and follow-up assessments creating a natural experiment.

Figure 1. Study design



Methods summary

Data for the current analyses were collected as part of a large-scale suite of school-based randomised controlled trials carried out in two phases, staggered by one academic year (see published [pre-registered report](#) for detailed methods).

Participants

A total of 11,450 pupils from 178 schools were included in the study with 6,419 pupils from 90 schools in phase 1 (pre-COVID-19 group) and 5,031 pupils from 88 schools in phase 2 (COVID-19 group). Pupils were in Years 7, 8, and 9 during both phases, with approximately equal numbers of males and females. The groups were compared on a range of school and individual-level characteristics (e.g., free school meal (FSM) eligibility) and were found to be similar. Compared to population-level pupil characteristics in state secondary schools across England (2020/21), the sample had a slightly higher proportion of pupils eligible for FSM (23.5% vs. 18.9%), and approximately the same proportion of pupils with special educational needs (10.4% vs. 11.5%). Ethnic minority pupils were slightly underrepresented (25% compared to 32.1%).

Mental health outcomes

Depressive symptoms were assessed using the Short Mood and Feelings Questionnaire (SMFQ) (6) which includes 13 self-report items relating to experiences of symptoms in the previous two weeks. Continuous scores (0 to 26) were the primary outcome in the current study with higher scores indicating greater symptoms. To establish cases of high depressive symptoms, a binary score was generated using the pre-defined cut-off (≥ 12) (6).

Externalising difficulties were measured using the behavioural difficulties sub-scale of the Me and My Feelings Questionnaire (7). Example items include 'I lose my temper' and 'I hit out when I am angry'. Responses to the 6-item self-report scale were summed with higher scores indicating greater externalising difficulties. A binary score was generated using an established cut-off (≥ 12) to identify cases of high externalising difficulties (8).

Life satisfaction was captured using the Huebner Life Satisfaction Scale (9). The 7-item adapted version was used in the current study and items recoded so that high scores indicated greater life satisfaction. Only a continuous measure of life satisfaction was included.

Main analytic approach

Regressions were conducted, accounting for clustering within schools, that predicted mental health outcome scores at 1-year follow-up with Phase (exposure to the COVID-19 pandemic) as the main predictor of interest. Baseline mental health scores and other covariates were controlled for (e.g., school characteristics such as FSM eligibility and existing interventions, and individual-level socio-demographic and socio-economic variables such as gender, ethnicity, and FSM eligibility). Regression is a statistical analysis where a model is fitted to the data and used to estimate the relationship

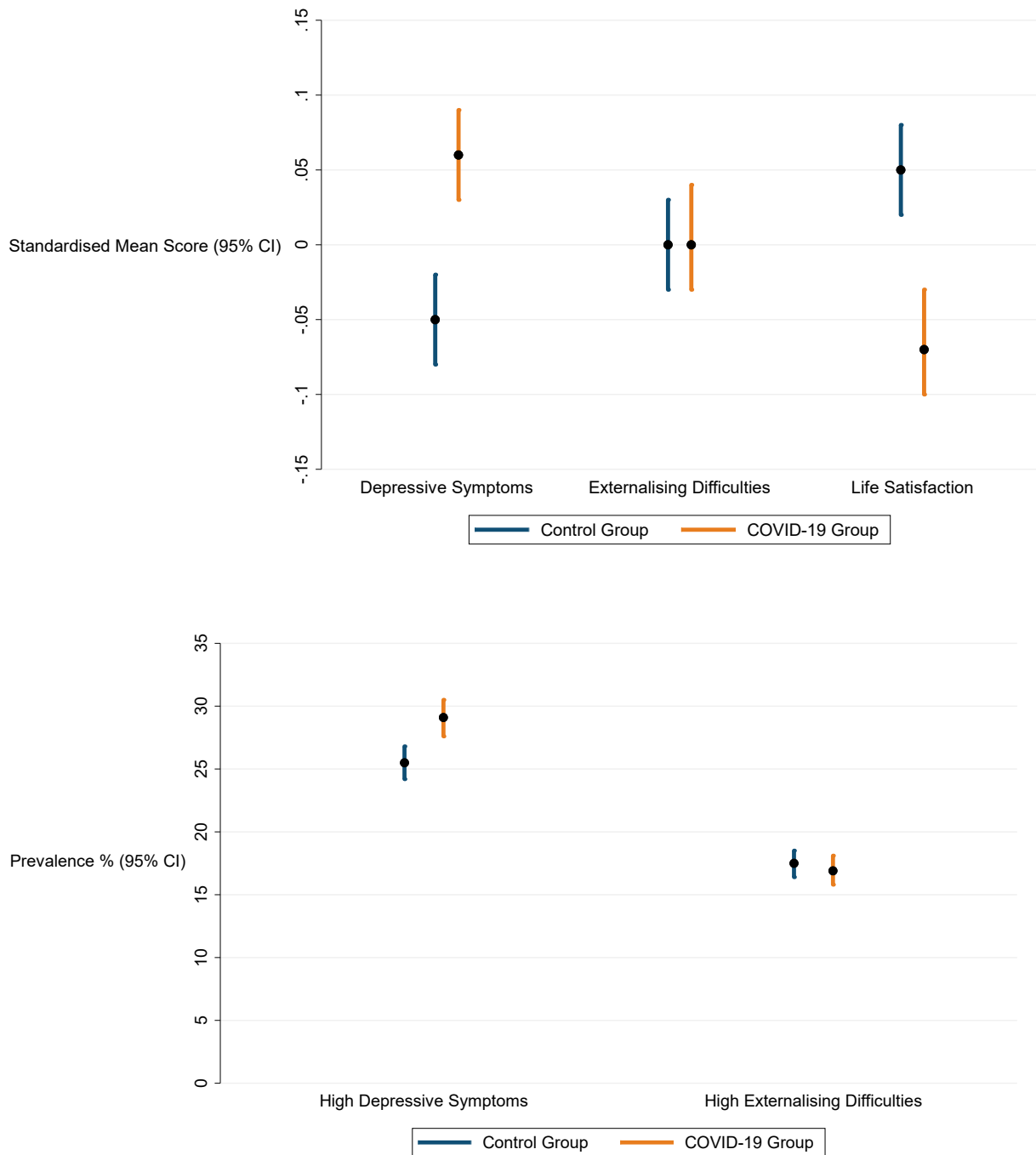
between an outcome variable (often called the dependent variable) and one or more predictor variables (also termed independent variables). Regression can be used for predicting and forecasting, or for testing causal relationships between variables. We also calculate the population attributable fraction (PAF) based on a scenario where the COVID-19 pandemic did not happen providing an estimation of the proportion of high depressive symptom cases fewer that might be expected in the absence of the pandemic.

Impact of the COVID-19 pandemic on adolescent mental health outcomes

Exposure to the COVID-19 pandemic had a negative effect on depressive symptoms and life satisfaction when compared with the control group. Those exposed to the pandemic had higher depressive symptoms and lower life satisfaction scores compared to the pre-pandemic group (control group). When using the established cut-off for high depressive symptoms, the same effect was observed with greater odds of having high depressive symptoms in the group exposed to the pandemic (see Figure 2). There was no effect of the COVID-19 pandemic on externalising difficulties (e.g., behavioural problems such as losing your temper or hitting out).

If the COVID-19 pandemic had not occurred, estimates suggest that we would observe 6% fewer adolescents with high depressive symptoms. This equates to a difference of 1.6% prevalence. Given that the prevalence of high depressive symptoms in the data was 27.1%, it can be estimated that in a scenario where the COVID-19 pandemic did not happen, the prevalence would be 25.5%.

Figure 2. Difference between the control group and the COVID-19 group at 1-year follow-up for all mental health outcomes



Note: Means are model predicted (controlling for baseline scores and other covariates) and standardised to enable comparison across mental health outcomes. Prevalence rates are calculated by multiplying model predicted probabilities by 100.

Subgroup differences in impact

Analysis of the subgroup effects revealed that both males and females exposed to the COVID-19 pandemic showed increased depressive symptoms and decreased life satisfaction. However, the negative impact of the pandemic appeared to be greater for females than males. Males exposed to the COVID-19 pandemic had fewer externalising difficulties than those in the control group. The opposite was found for females, with increased externalising difficulties in the group exposed to the pandemic. Across both the control and the COVID-19 group, adolescents eligible for FSM showed lower life satisfaction than those not eligible. However, adolescents of higher socio-economic position showed a greater difference between life satisfaction scores in the control group and the COVID-19 group, with life satisfaction scores decreasing closer to levels of the FSM eligible group. No clear subgroup effects were observed for ethnicity and special educational needs (SEN) status.

Conclusions

The COVID-19 pandemic has led to an increase in adolescent depressive symptoms and a decrease in life satisfaction. However, there was no overall effect on adolescent externalising difficulties. By analysing two groups of students assessed across two years and controlling for several relevant school and pupil characteristics, the current study was better able to isolate the impact of the COVID-19 pandemic on adolescent mental health than previous UK studies. For example, a regional birth cohort study based in the Wirral analysed longitudinal mental health data of young people aged 11-12 years and found increased depressive symptoms and externalising difficulties following the first COVID-19 lockdown (10). At the national level, the COVID-19 follow-up of the 2017 prevalence study also found a higher proportion of children experiencing mental health difficulties during the pandemic (11). However, due to a lack of a comparable control condition in both studies, it was difficult to differentiate between known developmental trends in mental health difficulties and the impact of the pandemic. The Wirral study also used parent and carer reported externalising difficulties as opposed to self-reported, which could explain why they found a potential effect of the pandemic on this outcome and the current study did not.

Beyond having pre-pandemic scores and a control condition, the current study also benefits from large samples of pupils attending schools across England. The large spread of schools taking part in the original trials provides better evidence for the impact of the pandemic on adolescent mental health at the national level compared to existing regional studies (10). Assessments of the comparability of schools and participants across the two phases showed that they were overall well-balanced on a range of relevant characteristics known to predict mental health. This finding increases the

confidence with which the observed differences can be attributed to the COVID-19 pandemic and the societal response.

Despite overcoming several methodological limitations, there are some possible sources of bias in the current study that must be considered. First, there was greater pupil drop-out at follow-up in the COVID-19 group (control group N = 1,896, COVID-19 group N = 2,776). This could have resulted in a biased sample, with schools and pupils with certain characteristics known to predict mental health more likely to participate at follow-up. However, the characteristics that predicted non-response across the control and the COVID-19 group were mostly overlapping and controlling for the probability of drop-out in the analyses did not change the study conclusions. Second, although no strong imbalances were found in the distribution of intervention and control (usual provision) schools across the two phases, there may have been differential effectiveness of interventions during the pandemic.

Policy implications

Prior to the COVID-19 pandemic, rates of adolescent mental health difficulties in England were of growing concern. As was predicted, the current study shows that the pandemic has impacted adolescent depressive symptoms and life satisfaction beyond changes expected based on existing downward trends. Findings indicate that many young people were experiencing high depressive symptoms during the early stages of the pandemic while schools and Child and Adolescent Mental Health Services (CAMHS) were trying to adapt to the challenging circumstances. The depressive symptoms measure (SMFQ) successfully discriminates between those with clinically referred depression status (referred for depression treatment by a clinician), and lower risk participants. The large proportion of adolescents with high depressive symptom scores during the pandemic demonstrates a high level of need for professional support. Moving forward, given the potential long-term nature of impacts, it is important to prioritise mental health support for school aged children and young people. This will require significant focus of resources and activity through a comprehensive public health approach that builds capacity within and between sectors to promote this populations' mental health and provide both early help in school and community settings alongside targeted support.

Acknowledgements

We would like to thank all the schools and pupils who participated in the larger study and all the researchers working on the Education for Wellbeing Programme from which these data are drawn.

References

1. Sadler K, Vizard T, Ford T, Marcheselli F, Pearce N, Mandalia D, et al. 2018. Mental health of children and young people in England, 2017 summary of key findings. Available at: <https://files.digital.nhs.uk/A6/EA7D58/MHCYP%202017%20Summary.pdf>
2. Fink E, Patalay P, Sharpe S, Holley S, Deighton J, Wolpert M. 2015. Mental health difficulties in early adolescence: A comparison of two cross-sectional studies in England from 2009 and 2014. *J Adolesc Health*, 56(5), 502–507. (doi: 10.1016/j.jadohealth.2015.01.023)
3. Patalay P, Gage, SH. 2019. Changes in millennial adolescent mental health and health related behaviours over ten years: A population cohort comparison study. *Int J Epidemiol*, 48(5), 1650–1664. (doi: 10.1093/ije/dyz006)
4. Hayes D, Moore A, Stapley E, Humphrey N, Mansfield R, Santos J, et al. 2019. School-based intervention study examining approaches for well-being and mental health literacy of pupils in Year 9 in England: study protocol for a multischool, parallel group cluster randomised controlled trial (AWARE). *BMJ Open*, 9(e029044). (doi: 10.1136/bmjopen-2019-029044)
5. Hayes D, Moore A, Stapley E, Humphrey N, Mansfield R, Santos J, et al. 2019. Promoting mental health and wellbeing in schools: Examining Mindfulness, Relaxation and Strategies for Safety and Wellbeing in English primary and secondary schools: Study protocol for a multi-school, cluster randomised controlled trial (INSPIRE). *Trials*, 20(1), 4–8. (doi: 10.1186/s13063-019-3762-0)
6. Angold A, Costello EJ, Messer SC, Pickles A, Winder F, Silver D. 1995. The development of a short questionnaire for use in epidemiological studies of depression in children and adolescents. *Int J Methods Psychiatr Res*, 5(4), 237–249.
7. Deighton J, Tymms P, Vostanis P, Belsky J, Fonagy P, Brown A, et al. 2013. The development of a school-based measure of child mental health. *J Psychoeduc Assess*, 31(3), 247–257. (doi: 10.1177/0734282912465570)
8. Patalay P, Deighton J, Fonagy P, Vostanis P, Wolpert M. 2014. Clinical validity of the Me and My School questionnaire: A self-report mental health measure for children and adolescents. *Child Adolesc Psychiatry Ment Health*, 8(1), 1–7. (doi: 10.1186/1753-2000-8-17)
9. Huebner ES. 1991. Initial development of the Student's Life Satisfaction Scale. *School Psychology International*, 12(3), 231–240. (doi: 10.1177/0143034391123010)

10. Wright N, Hill J, Sharp H, Pickles A. 2021. Interplay between long-term vulnerability and new risk: young adolescent and maternal mental health immediately before and during the COVID-19 pandemic. *JCPP Adv*, 1(e12008). (doi: 10.1111/jcv2.12008)
11. Vizard T, Sadler K, Ford T, Newlove-Delgado T, McManus S, Marcheselli F, et al. 2020. Mental Health of Children and Young People in England, 2020 Wave 1 follow up to the 2017 survey, (July), 1–50. Available at: https://files.digital.nhs.uk/CB/C41981/mhcyp_2020_rep.pdf

Citation and Contact

Mansfield, R[^]., Santos, J[^]., Deighton, J., Hayes, D., Velikonja, T., Boehnke, J. R+., & Patalay, P+*. (2021). The impact of the COVID-19 pandemic on adolescent mental health: a natural experiment. *Royal Society Open Science*

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Reference: RR1195

ISBN: 978-1-83870-341-7

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