Check for updates

Received: 6 September 2023 | Accepted: 15 April 2024

DOI: 10.1002/berj.4022

ORIGINAL ARTICLE

BERJ BERA

Effects of educational disruption and changes in school context on children's mental health: Associations with school level disadvantage and individual bullying involvement

Julia R. Badger[1,2] | **Carolina Guzman Holst**[3] | **Paul Thompson**[1] | **Lucy Bowes**[3] | **Rachel Hayes**[4] | **Susy Clarkson**[5] | **Judy Hutchings**[5] | **Richard P. Hastings**[1]

[1]School of Educational Learning and Communication Sciences, University of Warwick, Coventry, UK

[2]Department of Education, University of Oxford, Oxford, UK

[3]Department of Experimental Psychology, University of Oxford, Oxford, UK

[4]Department of Public Health and Sport Sciences, University of Exeter, Exeter, UK

[5]School of Human and Behavioural Sciences, Bangor University, Bangor, UK

Correspondence
Julia R. Badger, School of Educational Learning and Communication Sciences, University of Warwick, Coventry, UK.
Email: julia.badger@education.ox.ac.uk

Funding information
National Institute for Health and Care Research

Abstract

Natural disasters happen across the world. The situations are different but the disruption to children's education and wellbeing is similar. This study focused on the school context changes caused by the COVID-19 global disaster, and the impact of these changes on children's mental health. The aim was to better understand the associations between any mental health changes and children's school level of deprivation and pre-disaster involvement in bullying. Cross-sectional data were collected from 4316 children aged 6–11 years old, from 57 schools across England and Wales. Data were collected before the national lockdowns, early 2020, and 3–5 months after the final return to school, summer 2021, when schools were operating under a range of context restrictions. Child data included bullying involvement at school and health-related quality of life; teacher data included reports of each child's internalising, externalising and prosocial behaviours. School-level disadvantage was determined by the proportion of children in each school eligible to receive free school meals (an indicator of family disadvantage). The results showed that victims of bullying pre-lockdown, and pupils from schools with a higher concentration of disadvantage, had significantly reduced externalising behaviours

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.
© 2024 The Authors. *British Educational Research Journal* published by John Wiley & Sons Ltd on behalf of British Educational Research Association.

once back in the restricted school context. Victims had also increased their prosocial behaviours. It is possible that the restricted school context may have been a relief for the most vulnerable pupils. This study adds a new phase of understanding to the global disaster literature and the initial return to school when the environment is the same but the context has changed.

KEYWORDS
bullying, disadvantage, mental health, school context

Key insights

What is the main issue that the paper addresses?

The main issue this paper addresses is how impactful a restricted school context can be on children's internalising, externalising and prosocial behaviours after a global disaster, especially for the most vulnerable (victims of bullying and those from schools with a high concentration of disadvantage).

What are the main insights that the paper provides?

The main insights that this paper provides is that by restricting situations in which certain pupils become most vulnerable (such as whole-school peer interaction) it is possible to see an improvement in mental health and in some cases, an increase in prosocial behaviours. Children may feel safer and more seen.

INTRODUCTION

Disruption to education happens frequently across the world; disasters such as hurricanes, earthquakes and floods tear through communities rapidly and suddenly (Kousky, Kousky, 2016), and wars and civil unrest can lead to prolonged transitions and displacement (Islam et al., 2016; O'Brien, 2020). The situations are different but the impact on children's education and wellbeing is similar: periods of time away from schools, peers and stability. Owing to the sudden and unplanned nature of these disasters, much research around educational disruption occurs retrospectively or cross-sectionally. The COVID-19 pandemic also caused major disruptions for children and young people with global estimates revealing that schools were suspended in 188 countries with over 90% of young people (1.5 billion) out of education (UNESCO, 2021). The slow development and prolonged nature of the pandemic, however, allowed for a different approach with researchers collecting data longitudinally before and during the different stages of pandemic restriction and disruption. For many countries across the world, similar restriction phases were experienced including complete national or state 'lockdowns', social distancing, phased returns to work and school with staggered start times, workdays and minimal

14693518, 2024, 5, Downloaded from https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

contact with ongoing 'track and trace' and working from home at the report of a localised positive COVID-19 case.

In the UK, most children spent less than 5 months in school between March 2020 and March 2021 (GOV.UK, 2021a); only vulnerable children and children of pandemic 'key workers' were allowed to attend school during that period. During the lockdown phases children experienced significant changes and restrictions in their daily routines, which may have negatively impacted their education (Education Endowment Foundation, 2022; National Foundation for Educational Research, 2022a) and were often associated with increased internalising (emotional difficulties including symptoms of anxiety and depression) and externalising of problems (behavioural difficulties including hyperactivity and aggressive behaviours; Rosen et al., 2021). A systematic review using global pandemic data collected from over 79,000 children between February 2020 and July 2020 found that 18–60% of children and young people were scoring above risk thresholds for internalising symptoms (Viner et al., 2022). However, not *all* children and young people experienced negative impacts from the pandemic and some actually reported improvement or stability (Guzman Holst et al., 2023; Soneson et al., 2023). Protective factors for children and young people identified from investigating a range of disasters including and beyond COVID-19 involved good family relationships, social support, positive peer relationships and being back at school (Breaux et al., 2021; Guzman Holst et al., 2023; Lai et al., 2019; Mooney et al., 2021; Terranova et al., 2009a; Theberath et al., 2022; Wolf & Schmitz, 2023).

Research into local and global education disruption after a disaster often focuses on the impact of initial schooling loss, short- and long-term attainment and children's wellbeing and mental health (De & Thamarapani, 2021; see Harmey & Moss, 2023). However, less is known about the impact of ongoing educational disruption on mental health as children come back to school following a disaster and how this may relate to school restrictions school-level disadvantage and pre-disruption peer relationships (e.g. bullying involvement).

School context change

Returning to school, peer interaction and peer support can be protective factors for children following a disaster and disruption to education. Yet the pandemic, like other disasters before it, caused 'aftershocks' for the world with ongoing local and national restrictions and outbreaks (Harmey & Moss, 2023). In the UK, after the final return to school phase in March 2021, the COVID-19 aftershocks resulted in national school context changes: children were allowed to return to their original school environment, but their daily routines and interactions were restricted. Whole-school assemblies and activities were cancelled. Classes or year groups formed 'bubbles' (contact with a restricted number of people only), school arrival and departure times were staggered across the year groups, playtimes and lunchtimes were restricted to bubble groups only and therefore the ratio of staff to children during these times increased. This phase of the pandemic provided an unfamiliar–familiar situation and may have been both settling for some and unsettling for other children.

Peer relationships

During a typical school year, children and young people spend a large proportion of each day in school with peers. Peer relationships therefore play an important role in identity, inclusion, wellbeing and social status (Crosnoe & Johnson, 2011). It is therefore unsurprising that most children will miss their peers and peer interaction during the out-of-school

14693518, 2024, 5, Downloaded from https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

transition phase of a disaster and find returning to school and playing with peers a positive distraction (O'Connor & Takahashi, 2014). However, although peer relationships can be positive and supportive, there are situations where peer relationships can also be negative and problematic, for example, through social exclusion or bullying. These negative interactions can lead to an increase in mental health problems and a decrease in self-worth and quality of life (Christina et al., 2021; Farrington et al., 2012; Prinstein & Dodge, 2008; Reijntjes et al., 2010; Schoeler et al., 2018). When children moved to remote learning during the pandemic, there were concerns that this could lead to an increase in cyberbullying, which might be especially harmful owing to the sudden lack of positive peer and teacher support. However, a recent COVID-19 study surveying almost 35,000 students aged 10–16 years old found that cyberbullying did not increase during the pandemic with the increased use of technology and the Internet (Repo et al., 2022). This would suggest that on the whole, the level of peer-victimisation both in-person (as there was no or less peer contact) and online decreased while children were away from school during the pandemic lockdowns.

With a reduction in bullying during the pandemic, it is possible that individuals who typically experienced peer problems at school will have also experienced a 'psychological buffer' during the school closures. However, a study looking at changes in bullying involvement following hurricane Katrina found that bullying after the disaster actually increased amongst children directly impacted, compared with a control sample, with particular vulnerabilities for those children suffering with post-traumatic stress symptoms (Terranova et al., 2009b). What is unknown is whether the reduction in victimisation during the COVID-19 lockdowns, combined with the school context and peer-interaction restrictions when children returned to school, *improved* wellbeing and mental health for vulnerable children or whether the stresses children experienced during the COVID-19 lockdowns led to negative peer interactions once back and therefore a *worsened* wellbeing and mental health for vulnerable children.

School-level disadvantage

Family-level disadvantage has frequently been associated with poorer wellbeing, mental health and quality of life (Caspi et al., 2000; McDermott et al., 2013). School-level disadvantage – the percentage of pupils in a school who meet a disadvantage criterion such as below a threshold for family income – has also been found to be influential on a child, with higher school-level disadvantage resulting in poorer wellbeing, higher rates of school-based violence and a worsened school climate (Badger et al., 2023; Barnes et al., Barnes et al., 2006; Bradshaw et al., 2009).

When the pandemic school closures began, schools had to redesign their teaching and pupil interaction: technology played a substantial role. Indeed, a 2021 survey completed by over 6000 teachers in England found that schools with limited resources had trouble shifting to remote learning and that in the most deprived schools, 48% of isolating pupils did not have access to devices for online learning and class interaction (The Sutton Trust, 2022). In these situations, pupils became removed from their peers, their teachers and their usual school context. For children in more disadvantaged schools, this meant removal from a potentially negative school context. While the impact on education has been clear for all children and especially those at disadvantaged schools (GOV.UK, 2021b; National Foundation for Educational Research, 2022b), it is unknown whether returning to a restricted school context (smaller groups/bubbles/greater staff-child ratio) may in fact have led to a *reduction* in associated negative outcomes for mental health and quality of life for children from schools

14693518, 2024, 5, Downloaded from https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

with a high concentration of disadvantage and associated negative climate. In this case, a restricted school context could have proved to be a protective factor for some children and young people's mental health.

Current study

This paper focuses on the COVID-19 pandemic phase of children returning to school after the final country-wide enforced school closure in 2021 in the UK. It considers the unique interactions between, and outcomes for, children during this restricted school return and considers how this context change may have affected children's internalising, externalising, prosocial behaviours (actively supporting and helping others) and health-related quality of life depending on their school-level disadvantage and self-reported bullying involvement before the 12 months of COVID-19 disruption. We collected data from 4316 pupils aged 6–11 from four geographical regions in the UK.

Our questions were: (1) have children's internalising symptoms worsened; (2) have children's externalising symptoms worsened; (3) has children's prosocial behaviour changed; (4) has children's health-related quality of life (HRQoL) worsened; and (5) are any changes observed associated with school-level of disadvantage and/or bullying involvement (as a bully, victim or bully–victim) pre-lockdown?

METHOD

Design

A longitudinal design was used. For the present study, we used some of the data collected from the Stand Together Trial, a UK randomised controlled trial examining the effectiveness of the antibullying intervention KiVa (Clarkson et al., 2022). Data were collected in February and March 2020 pre-national school closures (time 1), and again between April and June 2021 a few months post-national school closures (time 2). Trial conditions had not been assigned at the time of either data collection time points.

Participants

Our sample comprised data from 57 primary schools across four geographic regions in England and Wales (UK). A total of 4316 children aged 6–11 years old (UK school year groups 3–6) participated: females = 48.6%; mean age pre-national school closures = 8 years 6 months (SD = 0.97 years)—age 6 = 0.13%, age 7 = 15.8%, age 8 = 33%, age 9 = 32.5%, age 10 = 18.4%, age 11 = 0.13%, age not reported = 8.4%.

Measures

School-level socio-economic disadvantage

This study focused on school-level disadvantage defined as the percentage of children in a school eligible to receive free school meals (eFSM)—an indicator of socio-economic disadvantage. Free school meal eligibility data are available on a statutory basis to children from

14693518, 2024, 5, Downloaded from https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

families who receive certain income-based government benefits. Schools in this study had a pre-national school closure average eFSM of 16.3% (SD = 15.4). The percentage eFSM variable was used as a continuous variable for the statistical analysis.

School size

School size was measured as the total number of pupils in years 3–5 (aged 6–10; baseline year groups) per school. Schools in this study had an average of 187.2 pupils (SD = 104.6) and a range of 42–366 pupils per school pre-national school closures. This variable was used as a continuous variable.

Internalising, externalising and prosocial behaviours

The Teacher Strengths and Difficulties Questionnaire (TSDQ; Goodman, 1997), a brief behavioural screening questionnaire, was completed by class teachers for each of their pupils pre- and post-national school closures. The questionnaire asks teachers to provide 'answers on the basis of the child's behaviour over the last six months or this school year'. The TSDQ has 25 questions covering five dimensions: emotional symptoms, peer relationships, conduct problems, hyperactivity/inattention and prosocial behaviour. Each question was scored from 0 (not true) to 2 (certainly true) with higher scores indicating greater levels of problem with the exception of the prosocial dimension where higher scores indicate higher levels of prosocial behaviour. Scores from the five emotional symptoms questions and the five peer problems questions were combined to make an internalising behaviour score with a range of 0–20. Scores from the five conduct problem questions and the five hyperactivity/inattention questions were combined to make an externalising behaviour score with a range of 0–20. The five prosocial behaviour questions were combined to make a prosocial behaviour score with a range of 0–10. The three totals were used independently as continuous variables. In the case of missing responses, data for all five scales was pro-rated according to the TSDQ guidance (www.sdqinfo.org): if three items were present the additional two items were pro-rated. If three or more items were missing, the data for that child in that variable analyses were excluded.

Health-related quality of life

The Child Health Utility 9D Index (*CHU-9D*, Stevens, 2009, 2010) was completed as a HRQoL measure by children themselves pre- and post-national school closures. It consists of nine questions, and each is scored from 1 to 5. The questions asked about feeling (1) worried, (2) sad, (3) pain, (4) tired and (5) annoyed, and experience of (6) schoolwork, (7) sleep, (8) daily routine and (9) joining in activities. Responses from all nine questions are weighted and transformed into a unity value running from 0.33 to 1, with 1 representing full health (Stevens, 2012). In the case of missing responses, the following rule was applied: if one item was missing, the data for that child in that variable analyses were excluded.

Victimisation and bullying perpetration

The Olweus Bullying and Victimisation Questionnaire (OBVQ; Olweus, 2006) was completed by the children pre- and post-national school closures. Scores were used to categorise each child's bullying involvement into one of the four possible categories: bully, victim,

14693518, 2024, 5, Downloaded from https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

bully–victim and not involved. A total of 22 questions were asked, of which 20 were used to create the dichotomous variables used in our analyses: 10 questions indicating having bullied someone and 10 indicating having been victimised. Children were able to omit any question by indicating that they 'would rather not say'. Questions were scored 1–5 where 1 = it hasn't happened, 3 = two or three times a month and 5 = several times a week. For categorisation purposes, we followed the literature (Solberg & Olweus, 2003) whereby a child had to answer 'two or three times a month' or more often to at least one of the 10 bully perpetration questions to be classified as a perpetrator of bullying. The same rule was applied when categorising a victim from the 10 victimisation questions. To be classified as a bully–victim (an individual who both perpetrates bullying and is bullied themselves), a child had to answer 'two or three times a month' or more often, on at least one of the 10 bully perpetration questions *and* one of the 10 victimisation questions. Children who never answered 'two or three times a month' or more often, on any of the 20 questions were classified as 'not involved'. For our analyses with the OBVQ classification, we excluded individual participants who had missing data or who had responded with the 'Prefer not to say' option on 50% or more of the OBVQ questions about being bullied and 50% or more of the OBVQ questions about bullying others. After considering practical guidelines regarding missing data (Newman, 2014), we applied the 50% criterion to be able to make rigorous classifications while still maximising the number of participants we could include. Following this procedure, we created dichotomous variables for each category (bully, victim, bully–victim, and not involved) where we recorded whether a student was a member of this category. Given the classification method, these categories were exclusive (children could not be in more than one group).

Procedure

At both time points, researchers attended the primary schools in person. They collected the Stand Together child data in one session as a whole class with children completing data collection on electronic tablets and teachers filling in paper questionnaires in 2020 and either paper or electronic questionnaires in 2021. For the current study, only the OBVQ and CHU-9D data were used from the children, and the TSDQ data from the teachers.

Data analysis

Children who had pre- and post-national school lockdown data and children who only had pre-national school lockdown data have been included. Generalised linear mixed models (GLMM) allowed for missingness in one time point to remain in the model and used maximum likelihood estimates. As the GLMM is a multilevel model to account for the dependency of observations for individuals repeated measures and clustering within schools, time (level 1) will be nested within individual (level 2) and individual nested within school (level 3): a three-level GLMM. Each model will dummy code time as '0' for time 1 and '1' for time 2. The following covariates are included at level 2 (individual): age and sex. At level 3 (school), school size is included. Residual plots for model fit are included in Supplementary Materials, Figures S1–S4.

For completeness, Little's MCAR test was also calculated: χ^2 (187) = 3421, $p < 0.001$. A known source of missingness occurred owing to complications from the lockdowns: data were collected from children in years 3–5 until the first national school lockdown. We restarted data collection in 2021 (the next academic year) and data were again collected from children in years 3–5. However, in 2021, year 6 data were collected from two of the four geographic regions (children who had been in year 5 for the 2020 data collection) to enable linking with the prior year 5 data. As the age covariate is included in the model,

14693518, 2024, 5, Downloaded from https://berj-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

we have an indicator of which children fall into this category; it is plausible that data were missing-at-random. We included a missing data analysis using pooled estimates from multiple imputations on 20 datasets for completeness (following recommendations by Van Buuren, 2018), and the analysed results were pooled following the rules of Rubin (1996). Trace plots (Figures S5 and S6) were also generated to assess convergence and pooled results included in supplementary files for a comparison with the primary analysis (Table S5).

All analyses used R statistical software (R Core Team, 2021) with the R packages 'lme4', 'glmmTMB' (Brooks et al., 2017) and 'Performance' (Lüdecke et al., 2021).

Our analyses were pre-registered: www.osf.io/p7nrm. Our analysis plan stated the use of linear mixed models (LMM) to investigate all of our questions, but we found that the residual distributions indicted some level of heterogeneity, potentially owing to the skew in distribution of the TSDQ data. We fitted the models changing to a GLMM using a log function (Poisson) to improve estimates and shrink standard errors. For the CHU-9D data, the scores range between 0 and 1, so we used GLMM with beta distribution to account for this range limitation (Hunger et al., 2012). Given that we pre-registered the LMM approach, the LMM analyses can be found in the supplementary data and are reported in this paper if there was a difference between the LMM and GLMM outcomes.

The inclusion of bullying involvement roles was not originally included in the pre-registration, but the inclusion was decided before any data were accessed or analysed. Any significant bullying involvement group differences were investigated further as an exploratory step using Tukey's *post-hoc* contrasts.

RESULTS

Demographics

All study demographics, both pre- and post-lockdown, can be found in Table 1.

Externalising behaviours

We found a significant reduction in overall teacher-reported externalising behaviours pre- to post-national school closures (rate ratio, RR = 0.92; standard error, SE = 0.02; $p < 0.0001$), when controlling for age, school size and sex (see Step 1 in Table 2). Males were reported to have higher levels of externalising behaviours pre-lockdowns (RR = 0.42, SE = 0.02, $p < 0.0001$), but the reduction of these behaviours across time remained consistent between the sexes. There was some discrepancy between the statistical models on the age adjustment, with the GLMM showing externalising behaviours reducing for every age category increased (older children showed fewer externalising behaviours; RR = 0.93, SE = 0.03, $p = 0.008$), but any reduction remained consistent between the age categories. However, this effect was not found in the LMM ($\beta = -0.14$, SE = 0.08, $p = 0.06$).

Externalising problems, bullying involvement and disadvantage

In step 2 of the GLMM, we included bullying involvement roles and school level eFSM (disadvantage) covariates and interactions with time (see Table 2). We found significant differences between the not involved reference condition and the three bullying involvement roles who each showed higher levels of externalising behaviours: bully (RR = 1.67, SE = 0.42, $p = 0.04$); bully–victim (RR = 1.27, SE = 0.14, $p = 0.03$); and victim (RR = 1.26, SE = 0.10, $p = 0.01$). When Tukey

14693518, 2024, 5, Downloaded from https://berj-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 1 Study statistics.

		Pre-lockdown				Post-lockdown		
Variable	***N***	**Mean (SD)**	**Minimum**	**Maximum**	***N***	**Mean (SD)**	**Minimum**	**Maximum**
Age	3955	8.54 (0.97)	6	11				
School size	31	187.18 (104.56)	42	366				
School eFSM (%)	51	16.32 (15.38)	0	62.7				
TSDQ internalising	4315	2.91 (3.48)	0	19	2974	2.55 (3.23)	0	18
TSDQ externalising	4316	3.63 (4.22)	0	20	2974	3.28 (3.98)	0	19
TSDQ prosocial	4314	8.12 (2.28)	0	10	2974	7.98 (2.29)	0	10
Child Health Utility 9D	3093	0.83 (0.12)	0.33	1	2068	0.83 (0.12)	0.33	1
	N	**Percentage (%)**			***N***	**Percentage (%)**		
Sex (total)	**7924**							
Male	4074	51%						
Female	3850	49%						
Bullying								
Not involved	2362	55%			3171	73%		
Bully	64	1%			40	1%		
Bully–victim	414	10%			196	5%		
Victim	1476	34%			909	21%		

Note: Age, school size, eFSM and Sex are time invariant predictors and are therefore summarised at Time 1 only.
Abbreviations: eFSM, eligible to receive free school meals; TSDQ, Teacher Strengths and Difficulties Questionnaire.

14693518, 2024, 5, Downloaded from https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 2 Model estimates and SE for TSDQ externalising behaviours. A three-level GLMM with time as level 1, individual variables (age and sex) as level 2 and school-level variable (school size) as level 3.

	Step 1: three-level GLMM		Step 2: Extended three-level GLMM	
Coefficient	**Incidence rate ratios**	**SE**	**Incidence rate ratios**	**SE**
Intercept	6.80***	1.70	5.55**	1.45
Time	0.92***	0.02	1.03	0.05
Age	0.93**	0.03	0.94*	0.02
School size	1.00	0.00	1.00	0.00
Sex	0.42***	0.02	0.43***	0.02
Bully			1.67*	0.42
Bully–victim			1.27*	0.14
Victim			1.26*	0.10
eFSM			1.02***	0.00
Bully × time			0.86	0.13
Bully–victim × time			1.05	0.07
Victim × time			0.87**	0.05
eFSM × time			0.99***	0.00
σ^2	0.41		0.41	
τ_{00}	1.25_{PID} 0.04_{SID}		1.20_{PID} 0.03_{SID}	
ICC	0.76		0.75	
N	2344_{PID} 30_{SID}		2344_{PID} 30_{SID}	
Observations	4116		4116	
Marginal R^2/conditional R^2	0.106/0.784		0.115/0.779	

Note: ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

Abbreviations: eFSM, eligible to receive free school meals; GLMM, generalised linear mixed models; ICC, intraclass correlation coefficient; SE, standard error; TSDQ, Teacher Strengths and Difficulties Questionnaire; σ^2, population variance; τ_{00}, between-subject variance.

post-hoc tests were conducted, only a significant difference between victim and not involved groups was found (currently in Supplementary File, Table S1). In addition, and reflecting the *post hoc* contrasts, the victim × time interaction revealed a significant reduction in externalising behaviours in self-reported victims, from pre- to post-national school lockdowns (RR = 0.87, SE = 0.05, $p < 0.01$) in stage 1 of the model. This effect disappeared when eFSM and bullying involvement were included. Schools with higher levels of deprivation were tentatively found to have higher levels of reported externalising behaviours of their pupils (RR = 1.02, SE < 0.01, $p < 0.001$). However, we found a significant eFSM × time interaction which suggests that pupils from schools with higher levels of disadvantage were also more likely to show a reduction in externalising behaviours from pre- to post-closures (RR = 0.99, SE < 0.01, $p < 0.001$). The magnitude of effects may reflect the size of the sample facilitating detection of small effect sizes. No other effects of interactions were found to be significant.

Internalising behaviours

Similar to externalising behaviours, we found a significant reduction in reported internalising behaviours pre- to post-national school closures (RR = 0.91, SE = 0.02, $p < 0.0001$; see Table 3)

14693518, 2024, 5, Downloaded from https://berj-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 3 Model estimates and SE for TSDQ internalising behaviours. A three-level GLMM with time as level 1, individual variables (age and sex) as level 2 and school-level variable (school size) as level 3.

	Step 1: three-level GLMM		Step 2: Extended three-level GLMM	
Coefficient	**Incidence rate ratios**	**SE**	**Incidence rate ratios**	**SE**
Intercept	3.10***	0.79	2.44**	0.68
Time	0.91***	0.02	0.95	0.06
Age	0.97	0.03	0.97	0.03
School size	0.999*	<0.001	1.00**	<0.001
Sex	1.00	0.05	1.00	0.05
Bully			1.31	0.48
Bully–victim			0.91	0.12
Victim			1.11	0.10
eFSM			1.02**	0.01
Bully × time			0.82	0.19
Bully–victim × time			1.19*	0.10
Victim × time			0.99	0.06
eFSM × time			1.00	<0.001
σ^2	0.45		0.45	
τ_{00}	1.17_{PID}		1.16_{PID}	
	0.07_{SID}		0.05_{SID}	
ICC	0.73		0.73	
N	2344_{PID}		2344_{PID}	
	30_{SID}		30_{SID}	
Observations	4116		4116	
Marginal R^2/conditional R^2	0.014/0.738		0.029/0.737	

Note: ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

Abbreviations: eFSM, eligible to receive free school meals; GLMM, generalised linear mixed models; SE, standard error; ICC, intraclass correlation coefficien; TSDQ, Teacher Strengths and Difficulties Questionnaire; σ^2, population variance; τ_{00}, between-subject variance.

when controlling for age, school size and sex. There was some discrepancy between the statistical models on the school size adjustment, with the GLMM finding a significant reduction in reported internalising behaviours pre-closures as schools increased in size (RR = 0.999, SE = <0.001, $p = 0.0343$). However, this was not found in the LMM ($\beta = -0.003$, SE = 0.002, $p = 0.16$) and probably reflects the size of sample facilitating detection of small effect sizes.

Internalising behaviours, bullying involvement and disadvantage

In step 2 of the GLMM, we included the bullying involvement roles and school level eFSM (disadvantage) covariates and interactions with time (see Table 3). We found that time became non-significant (RR = 0.95, SE = 0.06, $p = 0.45$) but that disadvantage was significant (RR = 1.02, SE = 0.01, $p < 0.002$). Similar to externalising behaviours, it seemed as though schools with higher levels of disadvantage were found to have higher levels of reported internalising behaviours. However, unlike externalising behaviours, any change in reported behaviour remained consistent across school level disadvantage. The bully–victim × time

14693518, 2024, 5, Downloaded from https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

interaction revealed a significant increase in internalising behaviours in self-reported bully–victims, from pre- to post-national school closures (RR = 1.19, SE = 0.10, $p < 0.04$) compared with those in the not involved group. No other interaction effects were found to be significant (Supplementary File, Table S2).

Prosocial behaviours

We found a significant reduction in reported prosocial behaviours pre- to post-national school closures for the conditional LMM ($\beta = -0.17$, SE = 0.05, $p < 0.01$) but not in the GLMM (RR = 0.98, SE = 0.01, $p < 0.15$; see Table 4) when controlling for age, school size and sex. This mixed evidence from both models probably reflects the insufficiency of the LMM to deal with departures from normality in the residual distribution, so we conservatively consider there to be no change over time. We found a sex difference, with females having significantly higher prosocial behaviours compared to the males pre-closures (RR = 1.16, SE = 0.01, $p < 0.0001$).

TABLE 4 Model estimates and SE for TSDQ prosocial behaviours. A three-level GLMM with time as level 1, individual variables (age and sex) as level 2 and school-level variable (school size) as level 3.

	Step 1: three-level GLMM		Step 2: Extended three-level GLMM	
Coefficient	**Incidence rate ratios**	**SE**	**Incidence rate ratios**	**SE**
Intercept	7.09***	0.43	7.07***	0.56
Time	0.98	0.01	0.96	0.03
Age	1.00	0.01	1.00	0.01
School size	1.00	0.00	1.00	0.00
Sex	1.16***	0.01	1.15***	0.01
Bully			0.88	0.14
Bully–victim			0.90	0.06
Victim			0.92*	0.03
eFSM			1.00	0.00
Bully × time			0.97	0.10
Bully–victim × time			0.97	0.04
Victim × time			1.05*	0.03
eFSM × time			1.00	0.00
σ^2	0.12		0.12	
τ_{00}	0.00_{PID} 0.01_{SID}		0.00_{PID} 0.01_{SID}	
ICC	—		—	
N	2344_{PID} 30_{SID}		2344_{PID} 30_{SID}	
Observations	4116		4116	
Marginal R^2/conditional R^2	0.059/NA		0.074/NA	

Note: ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

Abbreviations: eFSM, eligible to receive free school meals; GLMM, generalised linear mixed models; ICC, intraclass correlation coefficien; SE, standard error; TSDQ, Teacher Strengths and Difficulties Questionnaire; σ^2, population variance; τ_{00}, between-subject variance.

14693518, 2024, 5, Downloaded from https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Prosocial behaviours, bullying involvement and disadvantage

In step 2 of the GLMM, we included the bullying involvement roles and school level eFSM (disadvantage) covariates and interactions with time (see Table 4). We found that time remained non-significant (RR = 0.96, SE = 0.03, $p = 0.24$) and sex remained significant (RR = 1.15, SE = 0.01, $p < 0.0001$). Although a victim effect was observed in the model, after Tukey *post-hoc* comparisons with correction for multiple comparisons this did not show a statistically significant effect (Supplementary File, Table S3). The victim × time interaction revealed a significant increase in prosocial behaviours in self-reported victims, from pre- to post-national school closures (RR = 1.05, SE = 0.03, $p = 0.015$) compared with those in the not involved group. No other interaction effects were found to be significant.

Health-related quality of life

We found mixed evidence for the change in HRQoL between time points. The LMM indicated a significant time effect ($\beta = -0.01$, SE < 0.01, $p = 0.04$) despite the small magnitude of the estimate; however, the beta-distributed GLMM showed no evidence of change (exp (β) = 0.96, SE = 0.02, $p > 0.05$, see Table 5). Age was found to be a predictor in the GLMM (exp (β) = 0.96, SE = 0.01, $p < 0.01$), whereby a one-year increase in age from the average age is associated with a 4.5% decrease in HRQoL scores.

Health-related quality of life, bullying involvement and disadvantage

In step 2 of the GLMM, we included bullying involvement roles and school level eFSM (disadvantage) covariates and interactions with time (see Table 5). We found a time effect (exp (β) = 0.83, SE = 0.05, $p < 0.01$) whereby the HRQoL reduced from pre- to post-national school closures. Additionally, we found that self-reported bully–victims and victims had significantly lower levels of HRQoL compared to those in the not involved group (exp (β) = 0.52, SE = 0.07, $p < 0.001$ and exp (β) = 0.54, SE = 0.04, $p < 0.001$ respectively). Following Tukey *post-hoc* tests, additional significant difference between bully–victim and bully, and victim and bully groups was found (Currently in Supplementary File, Table S4). No other interaction effects were found to be significant.

DISCUSSION

We have five main findings. First, all children regardless of bullying involvement reported that their health-related quality of life was worse after the school closures, however perhaps unsurprisingly, victims and bully–victims reported lower levels of health-related quality of life before the school closures compared to those not involved in bullying. Second, when children returned to school after the pandemic school closures, teachers overall reported the same level of school-based prosocial behaviours but fewer internalising symptoms and externalising behaviours. Third, although self-reported victims, bullies and bully–victims had higher levels of externalising behaviours pre-school closures, victims were found to have significantly reduced these behaviours and increased their prosocial behaviours once back in the restricted school context. Fourth, although teachers in more disadvantaged schools reported more internalising and externalising behaviours in pupils pre-closures compared to those from less disadvantaged schools, they also reported that externalising behaviours had

14693518, 2024, 5, Downloaded from https://berj-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 5 Model estimates and SE for Child Health Utility 9D (CHU-9D). A three-level GLMM with time as level 1, individual variables (age and sex) as level 2 and school-level variable (school size) as level 3.

	Step 1: three-level GLMM		Step 2: Extended three-level GLMM	
Coefficient	**Estimates**	**SE**	**Estimates**	**SE**
Intercept	7.48***	1.11	9.52***	1.58
Time	0.96	0.02	0.83**	0.05
Age	0.96**	0.01	0.94**	0.01
School size	1.00	0.00	1.00	0.00
Sex	0.99	0.03	0.97	0.03
Bully			1.25	0.39
Bully–victim			0.52***	0.07
Victim			0.54***	0.04
eFSM			1.00	0.00
Bully × time			0.69	0.14
Bully–victim × time			0.98	0.09
Victim × time			1.06	0.06
eFSM × time			1.00	0.00
σ^2	—		—	
τ_{00}	0.17_{PID} 0.01_{SID}		0.12_{PID} 0.01_{SID}	
ICC	1.28		1.43	
N	1931_{PID} 30_{SID}		1931_{PID} 30_{SID}	
Observations	2824		2824	
Marginal R^2/conditional R^2	0.015/1.276		0.468/1.230	

Note: ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

Abbreviations: eFSM, eligible to receive free school meals; GLMM, generalised linear mixed models; ICC, intraclass correlation coefficien; SE, standard error; σ^2, population variance; τ_{00}, between-subject variance.

significantly reduced once back in the restricted school context. Fifth, bully–victims were reported to have significantly *increased* internalising behaviours once returned to school.

HRQoL and mental health

Although all children reported a worsened HRQoL when they returned to school after the pandemic closures, they seemed to show improved mental health. It is possible that the disruption to their routines that saw increased psychological problems in other studies during the pandemic (e.g. Rosen et al., 2021) and was reflected in their worsened HRQoL score in this study, started to settle once back in school. Disruption may have started to settle after a few months but had not reverted: usual school routines were not back to normal yet with distancing between classes and staggered drop-offs, pick-ups and break times, which children can find unsettling. However, as with other disasters, being back in the routine of seeing friends and receiving social support, albeit in restricted measures, may have been enough to not only stabilise but also increase their overall mental health (Lai et al., 2019; Mooney et al., 2021). Reflecting back on previous disaster research, it is perhaps not surprising that we found that, although a restricted context compared with pre-closures was

14693518, 2024, 5, Downloaded from https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

experienced, this return to school may have been an exciting and enjoyable experience for many children who until then had had far fewer social interactions while at home (O'Connor & Takahashi, 2014). It is also possible that peer and social situations that may previously have caused strains on children's wellbeing and mental health were lessened owing to the restricted interactions at school. Recent pandemic research has shown that pupils transitioning from primary to secondary school during the restrictions reported a more positive experience than expected owing to being sheltered from many aspects of the transition that had originally concerned them (Saville et al., 2024). Bubble groups and restricted interaction with the wider school afforded pupils a chance to settle in more gradually.

Relief for the most vulnerable

The idea that a restricted school context may impact children's mental health also plays into both findings that self-reported victims of bullying and children from schools with a higher concentration of disadvantage had reduced levels of externalising behaviours once returned to school, and that victims of bullying showed increased levels of prosocial behaviours. Our pre-closure results mirrored that of previous studies whereby children from more disadvantaged schools and victims of bullying showed higher levels of psychological problems (Badger et al., 2023; Barnes et al., Barnes et al., 2006; Bradshaw et al., 2009). However, potentially as a result of the change in school context owing to the pandemic, children from more disadvantaged schools and victims of bullying had improved mental health status. In this post-school closure restriction phase, children had fewer interactions across their schools and the staff to child ratio increased during playtimes and lunchtimes. This would naturally limit the amount of violence, bullying and negative peer interactions: the new school context felt safer. Our results showed that victims of bullying and children from more disadvantaged schools demonstrated significantly fewer conduct problems and less hyperactivity/inattention than those not involved in bullying and those from less disadvantaged schools. Previous literature is mixed regarding negative peer interactions and size of class or school (Olweus, 1991; Whitney & Smith, 1993; Wolke et al., 2001) but our results clearly show that in this restricted school context with fewer peer interactions, victims of bullying and children from more disadvantaged schools showed fewer behavioural problems: children felt safer and felt seen when the situations in which most violence, peer conflict and bullying are known to take place, were altered. In these instances, many children were able to enjoy the return to peer interaction (O'Connor & Takahashi, 2014) without the negative consequences. There was less need for counterattacks and defensive actions. It is, therefore, perhaps unsurprising that victims of bullying also increased in their prosocial behaviours towards their peers. Instead of feeling targeted, excluded or defensive, a better connection to the (restricted) school situation and less victimisation meant that children perhaps felt more open to helping their, now seemingly kinder, peers (Raskauskas et al., 2010).

Bully–victims and internalising behaviours

Interestingly, bully–victims had a reported *increase* in their internalising behaviours in this restricted school context. Bully–victims are a complex group of individuals who both bully others and are bullied themselves. They are known to struggle more with social adjustment and emotional regulation (Olweus, 1999) and are more at risk of psychosocial problems owing to their mixed profile (Fekkes et al., 2004). Although the restricted peer interactions and increased staff to child ratio will have limited the amount of negative peer interaction they are likely to have experienced, it may also have displaced these individuals in their

14693518, 2024, 5, Downloaded from https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

social position within their class and their school. Indeed, high status can be gained from bullying (van de Ploeg et al., Van der Ploeg et al., 2020) and can result in being influential and popular amongst peers (Dijkstra et al., 2013). Their victimisation will have lessened but so will their social status gained from bully perpetration. It is possible that this change in their social standing left them uncertain of their place in this new context, which may have resulted in an increase in anxiety, unsettled peer relationships and enhanced emotional symptoms. Owing to their complex profiles and emotional instability, bully–victims may also have had higher levels of internalising problems over the pandemic period compared with others. Thus, while their internalising problems may have been reducing (like the other children), they may still have had higher levels at the time of testing.

Limitations

The COVID-19 pandemic saw a shift towards online surveys as often the only means by which to collect data and track the pandemic impacts. Although many of these data provided valuable insights, there were some instances of over-estimates regarding the negative long-term impacts of the pandemic on children's wellbeing and educational attainment owing to methodological quality or limitations (International Public Policy Observatory, 2021). Although this study's methodology and approach is thorough and cautious and it had a good sample size, there are some limitations to consider. First, the TSDQ was completed by teachers for each of their pupils. Although this is a well-used measure, it asks teachers to base their answers on each child's behaviour over the past 6 months or that academic school year. This is not a problem for the pre-lockdown responses but could cause some inaccuracies for the post-lockdown responses. At the time of follow-up data collection (April–June 2021), teachers would only have seen their pupils' behaviours in person approximately 4–6 months non-consecutively since the start of the academic year in September 2020. Second, as children often move to a new class in a new academic year, they also get a new teacher. This meant that in the majority of cases, different teachers completed the TSDQs for each pupil across the two time points (although many of the teachers remained the same within the schools, they had a different class at time 2). Third, children's self-reporting on the OBVQ of their bullying involvement may have either under- or over-reported roles owing to recall error (a timeframe 'over the past 3 months') and fear of getting into trouble. Finally, the percentage of those categorised as bullies and bully–victims was small (1 and 7%, respectively), which therefore limits the strength of interpretation for those involvement roles.

CONCLUSION

Our study adds a new phase of understanding to the global disaster literature and the initial return to school when the environment is the same but the context has changed. It mirrors previous disaster literature showing that children's mental health suffers when away from the social support of, and enjoyment with, peers and teachers and improves on return. However, uniquely, it also shows how a restricted school context may be a relief for the vulnerable: victims of bullying and those from schools with a higher concentration of disadvantage. Restricted school context involving fewer peer interactions, withdrawal from whole-school climate and a higher staff-to-child ratio may have led to improvements in mental health overall although whether this would remain the case ongoing is yet to be determined. With more research into the impact of restricted school context on children's mental health and wellbeing it is possible that schools with poorer school climates and higher rates of poor mental health might consider some form of school-level restriction such as reducing the number of

14693518, 2024, 5, Downloaded from https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

children during any one play or lunchtime, or by either increasing the staff-to-child ratio during these times or by making staff more visible to give the impression of a more 'seen and safe' environment.

FUNDING INFORMATION

This project was funded by the National Institute for Health Research (NIHR) Public Health Research, grant number 17-92-11. The funder had no role in trial design, data collection, analysis, interpretation, or preparation of this article.

The views expressed are those of the authors and not necessarily those of the NIHR or the Department of Health and Social Care. The project will be published in full in Public Health Research. [Correction added on 14 May 2024, after first online publication: Funding Information has been updated in this version.]

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

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

ETHICS STATEMENT

This study has been reviewed and given favourable opinion by the Bangor University Research Ethics Committee: reference number 2019-16592.

PREREGISTRATION

This study's design, hypotheses and analysis plan were preregistered at https://osf.io/7a3jf.

ORCID

Julia R. Badger https://orcid.org/0000-0003-3060-1934

REFERENCES

Badger, J. R., Zaneva, M., Hastings, R., Broome, M. R., Hayes, R., Patterson, P., Rose, N., Clarkson, S., Hutchings, J., & Bowes, L. (2023). Associations between school-level disadvantage, bullying involvement and children's mental health. *Children*, *10*, 1852. https://doi.org/10.3390/children10121852

Barnes, J., Belsky, J., Broomfield, K. A., & Melhuish, E. (2006). Neighbourhood deprivation, school disorder and academic achievement in primary schools in deprived communities in England. *International Journal of Behavioral Development*, *30*, 127–136. https://doi.org/10.1177/0165025406063585

Bradshaw, C. P., Sawyer, A. L., & O'Brennan, L. M. (2009). A social disorganization perspective on bullying-related attitudes and behaviors: The influence of school context. *American Journal of Community Psychology*, *43*, 204–220. https://doi.org/10.1007/s10464-009-9240-1

Breaux, R., Dvorsky, M. R., Marsh, N. P., Green, C. D., Cash, A. R., Shroff, D. M., Buchen, N., Langberg, J. M., & Becker, S. P. (2021). Prospective impact of COVID-19 on mental health functioning in adolescents with and without ADHD: Protective role of emotion regulation abilities. *Journal of Child Psychology and Psychiatry*, *62*, 1132–1139. https://doi.org/10.1111/jcpp.13382

Brooks, M. E., Kristensen, K., van Benthem, K. J., Magnusson, A., Berg, C. W., Nielsen, A., Skaug, H. J., Maechler, M., & Bolker, B. M. (2017). glmmTMB balances speed and flexibility among packages for zero-inflated generalized linear mixed modeling. *The R Journal*, *9*, 378–400. https://doi.org/10.32614/RJ-2017-066

Caspi, A., Taylor, A., Moffitt, T. E., & Plomin, R. (2000). Neighborhood deprivation affects children's mental health: Environmental risks identified in a genetic design. *Psychological Science*, *11*, 338–342. https://doi.org/10.1111/1467-9280.00267

Christina, S., Magson, N., Kakar, V., & Rapee, R. (2021). The bidirectional relationships between peer victimization and internalizing problems in school-aged children: An updated systematic review and meta-analysis. *Clinical Psychology Review*, *85*, 101979. https://doi.org/10.1016/j.cpr.2021.101979

14693518, 2024, 5, Downloaded from https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Clarkson, S., Bowes, L., Coulman, E., Broome, M. R., Cannings-John, R., Charles, J. M., Tudor Edwards, R., Ford, T., Hastings, R. P., Hayes, R., Patterson, P., Sergott, J., Townsend, J., Watkins, R., Badger, J., Hutchings, J., & Stand Together Team. (2022). The UK stand together trial: Protocol for a multicentre cluster randomised controlled trial to evaluate the effectiveness of KiVa to reduce bullying in primary schools. *BMC Public Health*, *22*(608), 1–15. https://doi.org/10.1186/s12889-022-12642-x

Crosnoe, R., & Johnson, M. (2011). Research on adolescence in the twenty-first century. *Annual Review of Sociology*, *37*, 439–460. https://doi.org/10.1146/annurev-soc-081309-150008

De, P. K., & Thamarapani, D. (2021). Impacts of negative shocks on wellbeing and aspirations – evidence from an earthquake.

Dijkstra, J. K., Cillessen, A. H. N., & Borch, C. (2013). Popularity and adolescent friendship networks: Selection and influence dynamics. *Developmental Psychology*, *49*, 1242–1252. https://doi.org/10.1037/a0030098

Education Endowment Foundation. (2022). The impact of COVID-19 on learning: A review of the evidence. https://d2tic4wvo1iusb.cloudfront.net/production/documents/guidance-for-teachers/covid-19/Impact_of_Covid_on_Learning.pdf?v=1688698243

Farrington, D. P., Lösel, F., Ttofi, M. M., & Theodorakis, N. (2012). *School bullying, depression and offending behavior later in life: An updated systematic review of longitudinal studies*. National Council for Crime Prevention.

Fekkes, M., Pijpers, F. I. M., & Verloove-Vanhorick, S. P. (2004). Bullying behavior and associations with psychosomatic complaints and depression in victims. *Journal of Pediatrics*, *144*, 17–22. https://doi.org/10.1016/jpeds.2003.09.025

Goodman, R. (1997). The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry*, *38*, 581–586. https://doi.org/10.1111/j.1469-7610.1997.tb01545x

GOV.UK. (2021a). Learning during the pandemic: Quantifying lost time. https://www.gov.uk/government/publications/learning-during-the-pandemic/learning-during-the-pandemic-quantifying-lost-time

GOV.UK. (2021b). Learning during the pandemic: Review of research from England. https://www.gov.uk/government/publications/learning-during-the-pandemic/learning-during-the-pandemic-review-of-research-from-england

Guzman Holst, C., Bowes, L., Waite, P., Skripkauskaite, S., Shum, A., Pearcey, S., Raw, J., Patalay, P., & Creswell, C. (2023). Examining children and adolescent mental health trajectories during the COVID-19 pandemic: Findings from a year of the Co-SPACE study. *JCPP Advances*, *3*, e12153. https://doi.org/10.1002/jcv2.12153

Harmey, S., & Moss, G. (2023). Learning disruption or learning loss: Using evidence from unplanned closures to inform returning to school after COVID-19. *Educational Review*, *75*, 637–656. https://doi.org/10.1080/00131911.2021.1966389

Hunger, M., Döring, A., & Holle, R. (2012). Longitudinal beta regression models for analyzing health-related quality of life scores over time. *BMC Medical Research Methodology*, *12*, 144. https://doi.org/10.1186/1471-2288-12-144

International Public Policy Observatory. (2021). IPPO rapid evidence review: The impact of UK school closures on children during the COVID-19 pandemic. Accessed from: https://theippo.co.uk/https-covidandsociety-com-ippo-rapid-evidence-review-uk-school-closures-children-covid-19-pandemic/

Islam, A., Ouch, C., Smyth, R., & Wang, L. C. (2016). The long-term effects of civil conflicts on education, earning, and fertility: Evidence from Cambodia. *Journal of Comparative Economics*, *44*, 800–820.

Kousky, C. (2016). Impacts of natural disasters on children. *The Future of Children*, *26*, 73–92. https://www.jstor.org/stable/i40151846

Lai, B. S., Esnard, A.-M., Wyczalkowski, C., Savage, R., & Shah, H. (2019). Trajectories of school recovery after a natural disaster: Risk and protective factors. *Risk, Hazards & Crisis in Public Policy*, *10*, 32–51. https://doi.org/10.1002/rhc3.12158

Lüdecke, D., Ben-Shachar, M. S., Patil, I., Waggoner, P., & Makowski, D. (2021). Performance: An R package for assessment, comparison and testing of statistical models. *Journal of Open Source Software*, *6*, 3139. https://doi.org/10.21105/joss.03139

McDermott, J. M., Troller-Renfree, S., Vanderwert, R., Nelson, C. A., Zeanah, C. H., & Fox, N. A. (2013). Psychosocial deprivation, executive functions, and the emergence of socio-emotional behavior problems. *Frontiers in Human Neuroscience*, *7*, 167. https://doi.org/10.3389/fnhum.2013.00167

Mooney, M., Tarrant, R., Paton, D., Johnston, D., & Johal, S. (2021). The school community contributes to how children cope effectively with a disaster. *Pastoral Care in Education*, *39*, 24–47. https://doi.org/10.1080/02643944.2020.1774632

National Foundation for Educational Research. (2022a). The impact of Covid-19 on pupil attainment – a summary of research evidence. https://www.nfer.ac.uk/the-impact-of-covid-19-on-pupil-attainment-a-summary-of-research-evidence/

National Foundation for Educational Research. (2022b). Children and young people's wellbeing and mental health during the Covid-19 pandemic. https://www.nfer.ac.uk/children-and-young-people-s-wellbeing-and-mental-health-during-the-covid-19-pandemic/

14693518, 2024, 5, Downloaded from https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Newman, D. A. (2014). Missing data: Five practical guidelines. *Organizational Research Methods*, *17*(4), 372–411. https://doi.org/10.1177/1094428114548590

O'Brien, M. L. (2020). Disruption and decline: The gendered consequence of civil war and political transition for education in Tajikistan. *Post-Soviet Affairs*, *36*, 323–345. https://doi.org/10.1080/1060586X.2019.1701880

O'Connor, P., & Takahashi, N. (2014). From caring about to caring for: Case studies of New Zealand and Japanese schools post disaster. *Pastoral Care in Education: The Place of Pastoral Care in Disaster Contexts*, *32*(1), 42–53. https://doi.org/10.1080/02643944.2013.875584

Olweus, D. (1991). Bully/victim problems among schoolchildren: Basic facts and effects of a school-based intervention program. In D. Pepler & K. Rubin (Eds.), *The development and treatment of childhood aggression*. Erlbaum.

Olweus, D. (1999). Sweden. In P. K. Smith, Y. Morita, J. Junger-Tas, D. Olweus, R. Catalano, & P. Slee (Eds.), *The nature of school bullying: A cross national perspective* (pp. 7–27). Routledge.

Olweus, D. (2006). *Revised Olweus Bully/Victim Questionnaire (OBVQ)*. APA PsycTests. https://doi.org/10.1037/t09634-000

Prinstein, M., & Dodge, K. (2008). *Understanding peer influence in children and adolescents*. Guilford Press.

R Core Team. (2021). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. Accessed from https://www.R-project.org/

Raskauskas, J. L., Gregory, J., Harvey, S. T., Rifshana, F., & Evans, I. M. (2010). Bullying among primary school children in New Zealand: Relationships with prosocial behaviour and classroom climate. *Educational Research*, *52*, 1–13. https://doi.org/10.1080/00131881003588097

Reijntjes, A., Kamphuis, J. H., Prinzie, P., & Telch, M. J. (2010). Peer victimization and internalizing problems in children: A meta-analysis of longitudinal studies. *Child Abuse & Neglect*, *34*, 244–252. https://doi.org/10.1016/j.chiabu.2009.07.009

Repo, J., Herkama, S., & Salmivalli, C. (2022). Bullying interrupted: Victimized students in remote schooling during the COVID-19 pandemic. *International Journal of Bullying Prevention*, *5*, 181–193. https://doi.org/10.1007/s42380-022-00146-6

Rosen, M. L., Rodman, A. M., Kasparek, S. W., Mayes, M., Freeman, M. M., Lengua, L. J., Meltzoff, A. N., & McLaughlin, K. A. (2021). Promoting youth mental health during the COVID-19 pandemic: A longitudinal study. *PLoS One*, *16*, e0255294. https://doi.org/10.1371/journal.pone.0255294

Rubin, D. B. (1996). Multiple imputation after 18+ years. *Journal of the American Statistical Association*, *91*, 473–489. https://doi.org/10.1080/01621459.1996.10476908

Saville, K., Leaton Gray, S., Perryman, J., & Hargreaves, E. (2024). Creating year 7 bubbles to support primary and secondary school transition: A positive pandemic outcome? *Education*, *3-13*(52), 48–60. https://doi.org/10.1080/03004279.2023.2186977

Schoeler, T., Duncan, L., Cecil, C. M., Ploubidis, G. B., & Pingault, J. B. (2018). Quasi-experimental evidence on short- and long-term consequences of bullying victimization: A meta-analysis. *Psychological Bulletin*, *144*, 1229–1246. https://doi.org/10.1037/bul0000171

Solberg, M. E., & Olweus, D. (2003). Prevalence estimation of school bullying with the Olweus Bully/Victim Questionnaire. *Aggressive Behavior*, *29*, 239–268. https://doi.org/10.1002/ab.10047

Soneson, E., Puntis, S., Chapman, N., Mansfield, K. L., Jones, P. B., & Fazel, M. (2023). Happier during lockdown: A descriptive analysis of self-reported wellbeing in 17,000 UK school students during Covid-19 lockdown. *European Child & Adolescent Psychiatry*, *32*, 1131–1146. https://doi.org/10.1007/s00787-021-01934-z

Stevens, K. (2010). Working with children to develop dimensions for a preference-based generic, pediatric, health-related quality-of-life measure. *Qualitative Health Research*, *20*, 340–351. https://doi.org/10.1177/1049732309358328

Stevens, K. (2012). Valuation of the child health utility 9D index. *PharmacoEconomics*, *30*, 729–747. https://doi.org/10.2165/11599120-000000000-00000

Stevens, K. J. (2009). Developing a descriptive system for a new preference-based measure of health-related quality of life for children. *Quality of Life Research: an International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation*, *18*, 1105–1113. https://doi.org/10.1007/s11136-009-9524-9

Terranova, A. M., Boxer, P., & Sheffield Morris, A. (2009a). Factors influencing the course of posttraumatic stress following a natural disaster: Children reactions to Hurricane Katrina. *Journal of Applied Developmental Psychology*, *30*, 344–355. https://doi.org/10.1016/j.appdev.2008.12.017

Terranova, A. M., Boxer, P., & Sheffield Morris, A. (2009b). Changes in children's peer interactions following a natural disaster: How predisaster bullying and victimization rates changes following hurricane Katerina. *Psychology in the Schools*, *46*, 333–347. https://doi.org/10.1002/pits.20379

The Sutton Trust. (2022). State schools twice as likely as private schools to report high staff absences due to covid. Accessed from: https://www.suttontrust.com/news-opinion/all-news-opinion/state-schools-twice-as-likely-as-private-schools-to-report-high-staff-absences-due-to-covid/

14693518, 2024, 5, Downloaded from https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Theberath, M., Bauer, D., Chen, W., Salinas, M., Mohabbat, A. B., Yang, J., Chon, T. Y., Bauer, B. A., & Wahner-Roedler, D. L. (2022). Effects of COVID-19 pandemic on mental health of children and adolescents: A systematic review of survey studies. *SAGE Open Medicine*, *10*, 205031212210867. https://doi.org/10.1177/20503121221086712

UNESCO. (2021). Education: from school closure to recovery. Accessed from: https://www.unesco.org/en/covid-19/education-response

Van Buuren, S. (2018). *Flexible imputation of missing data* (2nd ed.). CRC Press.

Van der Ploeg, R., Steglich, C., & Veenstra, R. (2020). The way bullying works: How new ties facilitate the mutual reinforcement of status and bullying in elementary schools. *Social Networks*, *60*, 71–82. https://doi.org/10.1016/j.socnet.2018.12.006

Viner, R., Russell, S., Saulle, R., Croker, H., Stansfield, C., Packer, J., Nicholls, D., Goddings, A. L., Bonell, C., Hudson, L., Hope, S., Ward, J., Schwalbe, N., Morgan, A., & Minozzi, S. (2022). School closures during social lockdown and mental health, health behaviors, and well-being among children and adolescents during the first COVID-19 wave: A systematic review. *JAMA Pediatrics*, *176*, 400–409. https://doi.org/10.1001/jamapediatrics.2021.5840

Whitney, I., & Smith, P. K. (1993). A survey of the nature and extent of bulling in junior/middle and secondary schools. *Educational Research*, *35*, 3–25. https://doi.org/10.1080/0013188930350101

Wolf, K., & Schmitz, J. (2023). Scoping review: Longitudinal effects of the COVID-19 pandemic on child and adolescent mental health. *European Child & Adolescent Psychiatry*, *21*, 1–56. https://doi.org/10.1101/2022.12.20.22283720

Wolke, D., Woods, S., Stanford, K., & Schultz, H. (2001). Bullying and victimisation of primary school children in England and Germany: Prevalence and school factors. *British Journal of Psychology*, *92*, 673–696. https://doi.org/10.1348/000712601162419

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Badger, J. R., Holst, C. G., Thompson, P., Bowes, L., Hayes, R., Clarkson, S., Hutchings, J. & Hastings, R. P. (2024). Effects of educational disruption and changes in school context on children's mental health: Associations with school level disadvantage and individual bullying involvement. *British Educational Research Journal*, *50*, 2300–2319. https://doi.org/10.1002/berj.4022

14693518, 2024, 5, Downloaded from https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4022 by Oxford University, Wiley Online Library on [17/12/2024]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License