THE UNIVERSITY OF MELBOURNE

School staff support after major emergencies

Final Report to the Teachers Health Foundation

May 2022

Acknowledgements

We appreciate the contributions from school staff, students, the Victorian and Queensland Departments of Education, the Victorian Department of Education and Training Trauma Recovery team, and ORIMA colleagues to make this research possible in a shared commitment to supporting the wellbeing of school communities after the experience of the Black Summer bushfires. We also gratefully acknowledge the core research funding and support received from the Teachers Health Foundation and subsequent co-funding from the Victorian Department of Education and Training and the Erdi Foundation, and the expert advice and insights received from the members of the University of Melbourne Children and Disasters Advisory Committee.

Suggested report citation

Gibbs L, Cowlishaw S, Ulubasoglu M, Tekin E, Cesur R, Watterston J, Callard N, Cobham V, Leppold C, Marinkovic K, Molyneaux R, Baur J, Burns A, Meagher N, Kartal D, Tong L.A, Kwong E, Wraith R, Younger D, Newnham E, Cook J, Nursey J. School staff support after major emergencies. Final Report to the Teachers Health Foundation. University of Melbourne, May 2022.

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Executive summary

This project focussed on staff health and wellbeing issues and student risk patterns in the years after disaster events, building on our previous research findings about the impacts of natural disasters on school staff and students. A multi-method whole of school approach was undertaken to increase understanding of the different but interconnected issues affecting staff and student wellbeing post-disaster. The initial funding contribution from the Teachers Health Foundation attracted co-funding of $255,000 from government and philanthropic sources in recognition of this priority issue.

A 2021 survey of staff and student wellbeing in Victorian schools impacted by the 2019/2020 Black Summer bushfires revealed significantly higher psychological distress among staff and lower wellbeing among students in bushfire-affected schools, compared to general population norms. No difference was found between schools based on level of bushfire impact, indicating that any level of bushfire impact combined with the pandemic experience may undermine staff and student resilience. School connectedness scores were also significantly lower for students from bushfire affected areas, compared to the wider Victorian school population scores from 2020, particularly for secondary school students. Staff reported on their preferred sources of information and support. This will help to guide planning of future recovery support initiatives and the ways they are delivered.

Examination of school attendance rates in Queensland schools before and after the 2011 floods showed temporary flood impacts on student attendance levels for primary and secondary schools, in addition to existing variations between secondary schools and between primary and secondary levels. Attendance declined for primary schools in the year of the floods and increased for secondary. The relatively high social advantage of the school communities in the study is likely to have had a protective effect.

A scoping of school staff recovery support programs available in Australia was conducted to identify accessible options for schools affected by disasters. A range of programs and resources were identified that include a component for school staff affected by disasters. Education departments and unions also tend to arrange for trained health professionals to provide customised support sessions and resources for school staff.

A scoping review of emerging evidence about psychosocial disaster recovery support programs for students was conducted and published. It found that evidence for the benefits of support programs for students continue to emerge, including school-based programs delivered by trained school staff, although there are still gaps in the evidence about how best to support students at most risk including preschool students and those with disabilities.

To ensure a solution-focussed approach, a detailed knowledge translation plan was co-developed with co-investigators and stakeholder partners in the Children and Disasters Advisory Group to combine these new research findings with our existing research and translate them into practical strategies and new resources. A wide range of practical and academic outputs were achieved in 2021 including webinars and resources for school staff and parents, support activities for school staff, training for practitioners, policy briefings for government, a program of recovery and resilience supports for Victorian schools coordinated by the Department of Education and Training, and academic publications. The majority of

these research outcomes are embedded within the systems, practices and resources of partner organisations and so will continue to benefit school staff, students, families, and health professionals throughout 2022 and beyond in relation to current and future disaster experiences.

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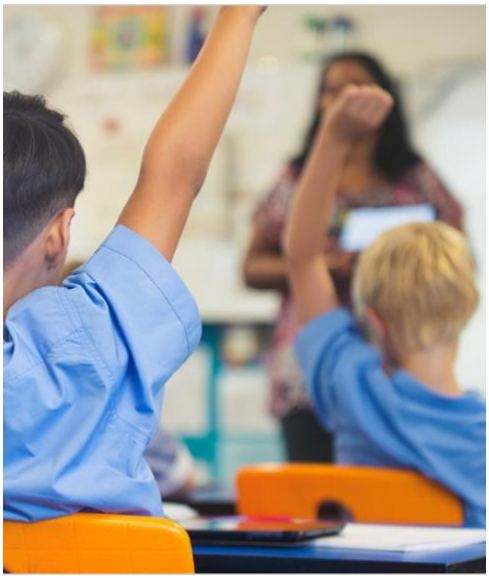
Background

There is limited but growing evidence about the impacts of natural disasters and other major emergencies on school communities over time. Typically, the strength of evidence is low because of the unpredictable and chaotic nature of disaster environments. Existing datasets held by Departments of Education offer the opportunity to conduct high quality research to identify risks and opportunities for intervention. Our previous studies have demonstrated the interplay between school staff and student recovery. In particular, the increased and expanded demands on teachers arising from the needs of trauma impacted children and families, and the tendency for school staff to prioritise student needs above their own self-care. This research program allowed us to examine various aspects of the impact of disasters on school staff and students, and options for recovery support.

This included a review of staff and student wellbeing in Victorian schools following the 2019/2020 Black Summer Bushfires; an examination of student engagement and school attendance post disasters; a scoping review of staff recovery support programs; a scoping review of psychosocial support programs for students; and translation of this knowledge, co-developed with our Children and Disasters Advisory Committee, into a whole of school approach including a suite of resources, strategies and impacts to support school communities affected by disasters.



Chapter 1: Staff and student wellbeing post-disaster

This component of the research program aimed to monitor the wellbeing and support needs of students and staff in Victorian schools affected by the 2019/20 Black Summer Bushfires. The survey was conducted by the Victorian Department of Education and Training Bushfire Trauma Recovery Team who commissioned and provided part funding (with co-funder Teachers Health Foundation) for the involvement of University of Melbourne research team and Phoenix Australia: Centre for Posttraumatic Mental Health (affiliated with the Department of Psychiatry at the University of Melbourne), to contribute to survey design and data analysis, and separate funding to ORIMA Research to contribute to data collection.

This research was exempt from the DET ban on research in schools in 2021. Ethics approval for this study was granted by the University of Melbourne Human Ethics Advisory Group (HEAG) (ref: 2021-20873-16920-4) and the DET Research in Schools and Early Childhood settings (RISEC) board (ref: 2021_004357).

In 2019-20, the Black Summer Bushfires affected large parts of Victoria and were almost immediately followed by the COVID-19 pandemic. This report presents findings from surveys of staff and students in bushfire-affected schools, which comprised a project that was commissioned by the Victorian Department of Education and Training (DET) Bushfire Trauma Recovery Team and carried out by a research team from the University of Melbourne and Phoenix Australia Centre for Posttraumatic Mental Health with a multi-disciplinary group of co-investigators.

There were 127 schools in bushfire-affected areas across Outer Gippsland and Ovens Murray that were eligible to participate in the surveys. The surveys were administered from October - November 2021, and 125 staff and 525 students from 10 schools participated. School staff included principals, assistant principals, teachers, and those in student support roles or administrative roles. Descriptive statistics were used to examine wellbeing levels for staff and students, drawing on established scales (PERMA profiler, K6, EPOCH), with the main focus being the comparison between (a) schools with different levels of bushfire impact, and (b) general population norms for specific measures (where available). There was also a secondary focus on possible implications of experiences associated with the COVID-19 pandemic. School-level measures of bushfire impact were based on existing DET records from an Impact Assessment Survey completed by school principals of all schools in Local Government Areas (LGAs) declared to be in State of Disaster due to bushfires in in January 2020. This examined the impacts of bushfires primarily in terms of damage to infrastructure and psychological damage to staff and students. This survey was used to rapidly assess the situation before schools re-opened. A DET panel reviewed all survey responses and categorised schools in relation to overall impact severity scores which correspond to levels in the School Management Incident System (SIMS). These scores range from nil to extreme severity of impact. Schools that did not respond were assumed to have no impacts. Schools in areas with known impacts but which did not respond were followed-up until a response could be elicited.

This report identifies discernible differences in wellbeing and distress levels in bushfire-affected schools, when all schools are compared to general population figures.

- For staff, this was reflected in higher levels of psychological distress in participating bushfire affected schools, when compared to general Australian population norms (mean K6 score of 12.47 compared to 8.7). Although there was no statistically significant difference in overall staff wellbeing scores, there were two wellbeing subscales which were modestly higher for all staff from participating bushfire-affected schools, relative to general population norms (pre-COVID-19), and these suggest potentially increased sense of supportive relationships and purpose in life.

- For students, the differences were reflected in lower wellbeing in the survey sample, compared to general Australian and American population norms (mean EPOCH score of 3.36 compared to 3.63). There were also significantly lower levels of engagement, perseverance, optimism and happiness among students in the survey sample, compared to general population figures, with secondary students in years 7-9 at bushfire affected schools having lowest absolute scores. School connectedness scores were also modestly lower (by 7-8%) in primary school students from bushfire affected areas, compared to the wider Victorian primary school population scores from 2020, and markedly lower (by 26-29%) for secondary school students in bushfire impacted schools compared to the wider Victorian secondary school population scores from 2020.

Importantly, this report finds no significant differences in wellbeing or distress levels between respondents in schools with high or low levels of bushfire impact, except for a modestly higher level of perseverance for primary students in schools with high or extreme bushfire impacts, compared to schools with lesser bushfire impact. As such, the survey results suggest that the whole sample across *all bushfire impact levels* faced greater distress (staff), and lower wellbeing and school connectedness (students) than the general population. In post-disaster studies, it is common to find differences in mental health and wellbeing outcomes based on levels of bushfire impact (with higher impact associated with lower mental health and wellbeing levels), however this trend was absent in the current survey results. This may be due to benefits from support programs provided to schools with higher levels of bushfire impact that is bringing them more in line with lower impacted schools. It is also likely to be a result of the cumulative impacts of bushfires and the pandemic on all of the schools, exacerbating challenges. Notwithstanding the absence of significant differences between lower and high impact schools, the findings highlight particular causes for concern about staff psychological distress and student wellbeing, particularly secondary students, in all bushfire affected regions.

This report additionally presents a range of more detailed findings for staff and students. For example:

- This report finds that **staff** reporting work- or family-related stress due to COVID-19 were likely to have lower wellbeing scores. Furthermore, all staff also reported concerning absolute levels of bullying, burnout, absenteeism and presentism (i.e. coming to work despite mental health problems or illness), along with other psychosocial issues that may include possible alcohol use problems and intimate partner violence exposure.

- **Staff** also reported that the most common sources of support for wellbeing issues were informal, and included support from family, friends, and critically also other school colleagues.

- This report finds that **students** in years 7-9, students who identified as gender non-binary or other gender, were living with a disability, or felt unsafe with their families, had significantly lower wellbeing scores.

- **Students** also described ways that schools should support students after bushfires, and most suggested that schools should provide 'someone to talk to about things that are worrying you'.

At the time of this survey, nearly two years after the Black Summer Bushfires, these findings suggest a need to provide long-term support to all schools in bushfire affected areas. Prior research has found that bushfire recovery can last for years or decades, and short-term interventions may not be sufficient. This is particularly the case in the current circumstances where there have been cumulative effects of the bushfires and the pandemic. Based on the present survey findings, this report makes the following recommendations to DET:

- Prioritise future wellbeing and psychological distress monitoring over time across all school communities in Victoria, including non-bushfire-affected schools, in order to facilitate improved understanding of unfolding impacts of the COVID-19 pandemic alone, and when additional to the Black Summer Bushfire impacts.

- Continue to provide a range of recovery support options that recognise staff resilience, but also address potential ongoing psychosocial challenges for all schools across bushfire-affected areas, regardless of whether each school has had 'high' or 'low' impacts. These options may include programs that aim to reduce psychosocial challenges (e.g., bullying), improve early identification and disclosure of psychological distress or wellbeing issues, and support emotional preparedness including guidance for peer-to-peer support (e.g. 'accidental counsellor' training).

- Continue to provide a range of recovery support options that recognise student resilience, but also address potential ongoing psychosocial challenges for all schools across bushfire-affected areas, regardless of whether each school has had 'high' or 'low' impacts.

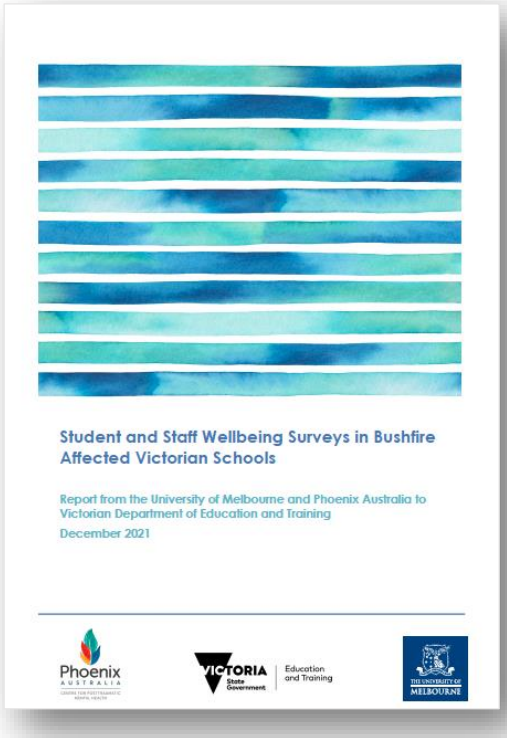
- Provide logistical support for all schools in bushfire affected regions to ensure trauma trained school staff or external professionals are available to directly support student wellbeing. This would action a response to students' nomination that after disasters, schools should provide 'someone to talk to about things that are worrying you'. Review additional support options nominated by student survey respondents to guide school and Department level support strategies.

- Provide guidance and resources to staff on how to identify and provide appropriate support and referrals for students showing ongoing symptoms of trauma.

Overall, this research finds significantly higher distress among staff and lower wellbeing among students in bushfire-affected schools, compared to general population norms. Due to limitations in the sampling frame of this project, the findings of this study should be seen as emerging rather than definitive. However, even as emerging findings, these results present an imperative for further action. Addressing wellbeing within school communities will be crucial to supporting recovery from both the Black Summer Bushfires and the COVID-19 pandemic. Continuing to monitor staff and student wellbeing across the State will also help to identify the additional complications of multi-disaster exposure.

Output & impact

The full staff and student 2021 wellbeing survey report is available in Appendix 1. Further details about the dissemination of this evidence and other strategies for change are included in Chapter 5 **Outcomes for students, families and teachers**.



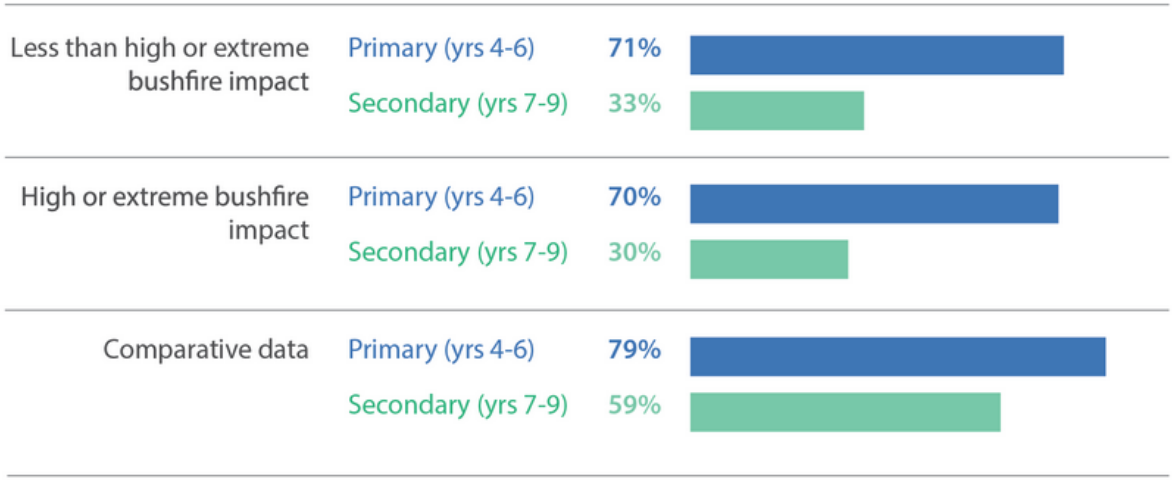
Chapter 2: School engagement post disaster

This component of the research program aimed to examine disaster impacts on student school engagement and school attendance using two sources of data. The first source of data was the school connectedness measures within the Victorian DET student survey (see Chapter 1), conducted in October -November 2021 with 525 student participants from 10 different schools. The second source of data was Queensland Department of Education student attendance data, collected from 219 government primary and secondary schools in two urban areas of Queensland in the years before, of and after the 2011 floods.

School Connectedness

School connectedness was assessed through five survey questions taken from the Attitudes to School Survey ('I like this school', 'I am happy to be at this school', 'I feel like I belong at this school', 'I look forward to going to school', 'I feel proud about being a student at this school'). Levels of school connectedness were significantly higher in primary schools compared to secondary schools but there were no differences based on bushfire impact in the proportions of primary students or secondary students who felt connected to their school. However, there were large differences in school connectedness in the bushfire impacted schools compared to wider Victorian data (all government schools) from 2020. The levels of school connectedness in bushfire impacted primary schools was approximately 7-8% lower than state-wide levels in 2020 and was approximately 26-29% lower in secondary schools. Given this involves a comparison of 2021 and 2020 data, it is possible that some of this effect reflects the extended impact of the pandemic. However, it is most likely to reflect the added impact of multi-disaster exposure for students attending schools in bushfire affected areas.

Figure 1. Proportion of students that 'agreed' or 'strongly agreed' to questions indicating they felt connected to their school, in comparison to 2020 results across all Victorian government schools



*Comparative data on school connectedness is from the Attitudes to School Survey results from all Victorian government schools in 2020 (State of Victoria Department of Education and Training, 2021; Holland, 2021).

School attendance

International evidence suggests that disaster exposure is associated with reduced student school attendance but the strength of evidence is limited. This study analysed attendance data from the Queensland Department of Education, collected from state primary and secondary schools in two urban areas of Queensland. Data was linked with flood impact data from the Queensland Reconstruction Authority and the suburb based Australian Bureau of Statistics 2011 Index of Relative Socio-economic Advantage and Disadvantage (IRSAD), to examine whether the 2011 floods impacted attendance rates for state schools in two council areas. A total of 219 schools were included in this study, comprising 173 primary schools and 46 secondary schools, (inclusive of 5 schools with both primary and high students). Data included in this study was aggregated by gender and year level, and covered three time points (semester 1 of 2010, 2011, and 2012).

Prior to the floods, attendance rates were significantly higher in primary compared to secondary schools. This study indicates that there were temporary flood impacts on student attendance levels for primary and secondary schools, in addition to existing variations between schools and between primary and secondary levels. The patterns of impact were different for primary and secondary schools with primary schools showing reduced attendance in the year of the floods and secondary schools reporting increased attendance. The primary and secondary schools in this study were in urban locations and tended to be ranked relatively high in social advantage. This is likely to have had a protective effect on the extent and nature of disaster influences on student attendance. Substantial variation between secondary schools before and after the floods indicates there is potential to make a difference through school-level initiatives. Further research is needed to investigate student level variations and impacts on school communities with high risk student populations. Inclusion of pre-disaster, socioeconomic and comparative data are important inclusions in studies of disaster impacts on student attendance.

Output & impact

These findings were used to develop a research paper and a resource specifically for parents to guide them about how disaster exposure can affect student school engagement and how to support their recovery and connection to school. See Appendix 2 for the draft school student attendance publication and Appendix 3 for the draft parent resource. The resource is receiving final input from the Children and Disasters Advisory Committee and then will be converted by our design specialist, Alana Pirrone, into a visually engaging format to aid readability and impact for its dissemination in February 2022 for the start of the school year. Further details are included in Chapter 5 *Outcomes for students, families and teachers* about the dissemination of this evidence and other strategies for change.

Chapter 3: School staff recovery support programs

This component of the research program aimed to identify psychosocial recovery support programs for school staff following disasters. A scoping review of non-clinical programs and resources suitable for school staff and readily available in Australia was conducted in 2020/21 to inform a guide for post disaster support options. This was an expert-informed review supported by the Children and Disasters Advisory Committee (see Appendix 4 for Committee membership).

A review of psychosocial disaster recovery options available for school staff in Australia identified 16 programs and 9 sources of educator resources. The programs varied in content, delivery mode, strength of evidence and accessibility. The option which aligned most closely with the appraisal criteria, including high levels of accessibility across Australia, was the suite of programs and resources for educators provided by Emerging Minds. This program is recommended by Beyond Blue following completion of their own Resilient Australia award-winning Be You Bushfires Response program. Many tailored programs are also delivered to school staff by trauma specialists following disasters. A combination of tailored support and readily accessible programs and resources are likely to be most beneficial to staff over the weeks, months and years following a major disaster.

Output & impact

See Appendix 5 for the full scoping report on staff support programs and Chapter 5 **Outcomes for students, families and teachers** about the dissemination of this evidence and other strategies for change.

Chapter 4: Child and adolescent psychosocial support programs following natural disasters – a scoping review of emerging evidence

This component of the research program aimed to identify and describe evidence published in the past 3 years from trials of psychosocial support programs for children and adolescents affected by natural disasters. Previous reviews have indicated these programs are beneficial overall. Positive impacts were documented in school-based programs conducted by trained teachers and para-professionals with stronger effects achieved by more qualified professionals.

This scoping review contributed to the growing understanding of the contribution of psychosocial programs to child and adolescent recovery following exposure to natural disasters. Most importantly it showed that positive impacts are being achieved across a range of programs, delivery modes and settings. Further studies are needed to confirm the findings because there are still a number of limitations to the evidence, not surprisingly given the complexity of post trauma mental health needs and the disrupted context of post disaster environments. Structuring the evidence according to a stepped care model that differentiates between universally delivered programs, programs targeting children with trauma symptoms, and treatment programs for students with high needs, provided a useful means of aligning the available evidence with recommended approaches. Similarly, Hobfoll et al's (9) nominated five essential elements for intervention following mass trauma, provide a useful guide for both intervention aims and assessment that is consistent with programs currently being delivered, if not explicitly stated. The most common focus across the interventions, and thus the developing evidence, was promotion of a sense of calm and safety. Unfortunately, current gaps in the evidence relate to potentially the most vulnerable of groups – preschool children, culturally and linguistically diverse groups, children and adolescents with disabilities, and socioeconomic disadvantage. This highlights future research priorities, as well as the need to build further understanding of programs that are feasible and effective in complex, multi-exposure disaster settings.

Output & impact

See Appendix 6 for the full published paper on post disaster psychosocial support programs for children and Chapter 5 **Outcomes for students, families and teachers** about the dissemination of this evidence and other strategies for change.

Chapter 5: Outcomes for staff, students, families and schools

A detailed knowledge translation plan was co-developed with co-investigators and stakeholder partners in the Children and Disasters Advisory Group. Professor Lisa Gibbs established and is Chair of the Children and Disasters Advisory Group which provides input and guidance into the disaster research program and the translation of research into useful strategies and resources to benefit school staff, students, families and school communities affected by disasters (see Appendix 4 for Membership of the Children & Disasters Advisory Group). A wide range of practical outputs and impacts were achieved in 2021 and will continue to be developed. While they are planned and implemented as a whole of school community approach, they are presented below according to the different audiences/end-users, as different pathways to benefit students, families and schools:

School staff

- Our disaster research was formally named as an impetus for a tender recently released by the Victorian Department of Education and Training for development and delivery of a disaster **emotional preparedness program for school staff in 2022**

- Our recommendations relating to **staff disaster recovery support programs** (see Appendix 5) have been made available to the Victorian Department of Education and Training Trauma Recovery Team to guide support services for school staff affected by disasters. They will also be incorporated into the existing APPRAISE tool early in 2022 (https://mspgh.unimelb.edu.au/__data/assets/pdf_file/0019/3525022/Appraise-report_combined.pdf) to guide school leaders in selection of post-disaster school support programs.

- Victorian Department of Education and Training developed a program of recovery and resilience and supports for Victorian schools affected by multiple disasters including bushfires and the pandemic. This included commissioning us to prepare **PowerPoint training slides** so that they could build the capacity of school leaders to apply our research findings and use our resources and practical tips (2 of 4 sets of 30 min and 15min slide presentations – see government section for details about the other slide sets).

- The Department of Education and Training also provided Emotional Preparedness Professional Learning for members of school leadership teams – will be delivered in Terms 2, 3 & 4 of 2022.

- Part of the Department of Education and Training response to the student and staff wellbeing survey findings is making the **Phoenix Australia program – SOLAR** for adults (Skills for Life Adjustment and Resilience) available to schools. This includes a structured coaching program for **school staff** (teaching or support staff) on how to teach age-appropriate skills for coping with the impact of disasters to build resilience. 100 free places were made available for staff to be trained as SOLAR Coaches in Term 3 2022. Potential coaches do not need to have a background in mental health.

- Students and Families

- We presented **webinars** for parents and school staff about student wellbeing and school engagement. This included:

    - Roadmap to Recovery Following a Bushfire, May 2021. There were 3 speakers: Professor Lisa Gibbs to provide evidence about the impacts of disasters and ways to promote resilience in school communities; Janette Cook, former principal of a primary school that was destroyed in the Black Summer bushfires to provide an educator's perspective; and Michelle Roberts, educational psychologist to provide guidance on student and staff care. It was produced and promoted by Beyond Blue for families and school staff across Australia, with particular interest from Victoria and NSW. This continues to be available as a public resource – https://beyou.edu.au/resources/sessions-and-events/a-roadmap-to-recovery-following-a-bushfire

    - 10 years Beyond Bushfires – Children, families and schools Oct 2021. Three speakers: Professor Lisa Gibbs to provide the evidence about the impacts of disasters and ways to promote resilience for families and schools; Jane Nursey, trauma psychologist to provide guidance on care for students, parents and teachers; Bronwyn Sparkes, parent of a family heavily impacted by the Black Saturday bushfires to provide personal insights into the long term recovery process. Produced and promoted by Australian Institute for Disaster Resilience for families and school staff across Australia with particular interest from Victoria and NSW. This continues to be available as a public resource – https://knowledge.aidr.org.au/resources/recovery-matters-webinar-series/

- We developed a **parent resource** that provides reassurance and guidance about disaster impacts on student school engagement (see Appendix 3). This is currently being finalised in consultation with the Children and Disasters Advisory Committee for dissemination in February 2021. The Victorian Department of Education and Training Trauma Recovery Team have confirmed they will be sharing it at the beginning of the 2022 school year directly with the 49 schools highly impacted by the Black Summer bushfires to send out to parents, and making it available as a resource to all other Victorian schools. Collaborator Dr Elizabeth Newnham has also committed to sharing it with bushfire impacted schools across Western Australia. It will also be used at the start

of the 2022 school year as part of the ChildSpace project we are conducting with the Australian Childhood Foundation to support families in areas that are still highly impacted by the 2019/2020 Black Summer bushfires.

- We partnered with Red Cross and the ABC in the production of the **After the Disaster podcast series** which included an episode specifically focussed on children, families and school communities – https://www.abc.net.au/radio/programs/after-the-disaster/ This has been profiled on The Drum and is getting regular airtime on ABC Radio

- Professor Gibbs was **interviewed** by Patricia Karvelas on ABC Afternoon Television News about giving families guidance about expectations for students returning from remote learning during the pandemic.

- Part of the Department of Education and Training response to the student and staff wellbeing survey findings is making the **Phoenix Australia program – SOLAR** for kids (Skills for Life Adjustment and Resilience) available to schools. As noted above, school staff will be trained as SOLAR coaches to help students with disaster recovery and resilience self-care strategies.

Health practitioners

- We contributed a new book chapter in the 6th edition of 'Children, Families and Communities' published by Oxford University Press. This book is used as a text in 18 Australian Universities to **train education, psychology and social work students** with the biggest audience in early childhood education:

  > Marinkovic K, Kosta L, Mergelsberg E, Newnham E, Nursey J, Gibbs L. Climate change and disasters: new challenges to supporting child mental health and wellbeing in Australia. In: Grace R, editor. Children, Families and Communities: Oxford University Press; (in press)

- Contributed a new chapter in the 3rd edition of *Working with Vulnerable Families* focussed on supporting children and their families following natural disasters. The book has been a valuable resource for **university psychology, education and social work students**, providing a comprehensive and evidence-based introduction to child and family centred practice in Australia and New Zealand that encourages students and practitioners alike to "think child, think family, think community" to promote the safety and wellbeing of children, young people and their families:

  > Newnham E, Mergelsberg E, Marinkovic Chavez K, Kosta L, Nursey J, Bullen J, et al. Supporting Families Affected by Disasters. . In: Heward-Belle S, Tsantefski M, editors. Working with Vulnerable Families. 3rd ed. Sydney, Australia (in press).

- The research findings continue to be integrated into Phoenix Australia's **trauma training** for health practitioners working in disaster affected areas.

- The research findings continue to be integrated into Australian Red Cross **recovery training** for emergency staff and volunteers working in disaster affected areas.

Government and service providers

- Professor Gibbs and co-authors Jane Nursey, Professor Helen Cahill and Professor Jim Watterston released an **opinion article** in University of Melbourne online magazine Pursuit about the need to give students time to recover before rushing to restore academic progress – https://pursuit.unimelb.edu.au/articles/giving-students-time-for-recovery-and-learning

- The Pursuit article triggered the ABC News interview with Patricia Karvelas noted above and was the basis for a **government roundtable discussion** between Professor Gibbs and her co-authors with representatives from the Department of Premier and Cabinet, National Resilience and Recovery Agency, Federal Department of Education, Skills and Employment, Federal Department of Social Services, Victorian Department of Education and Training, Victorian Department of Health

- We included **formal recommendations** targeted for families and school communities in the 10 years Beyond Bushfires report which has been downloaded over 1,750 times, was used as a guide for Bushfire Recovery Victoria and Emergency Management Victoria for service delivery, directly informed National and State Departments of Education in their post-bushfire and pandemic decision making and is available to recovery workers and health practitioners through the Emergency Management Victoria Recovery Portal and the Phoenix Australia Disaster Mental Health Hub

- Victorian Department of Education and Training found our research and advice so useful they commissioned us to prepare **Powerpoint training slides** for them so that they could build the capacity of department senior managers to apply our research findings and policy recommendations (2 of 4 sets of 30 min and 15min slide presentations)

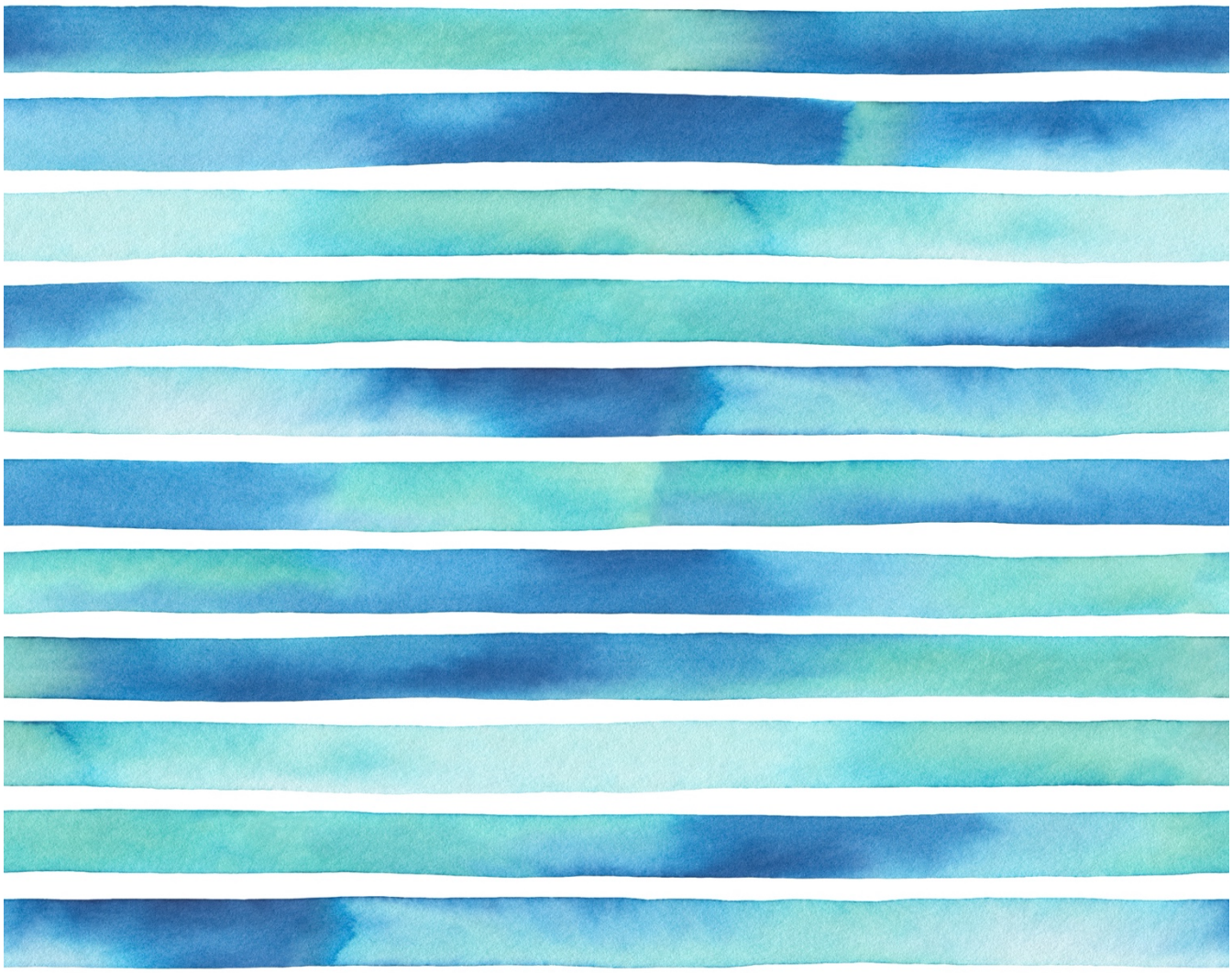
- Professor Gibbs presented on the findings of the school student and staff wellbeing surveys in Dec 2021 to the **Department of Education and Training Trauma Recovery Advisory Group** which includes the department trauma recovery staff and the regional bushfire recovery coordinators and trauma psychologists supporting bushfire-affected school communities. They discussed the findings with interest to guide their efforts to support the school communities which are still highly impacted by the 2019/2020 Black Summer bushfires.

These research outputs and impacts will continue to support disaster resilience for school staff, students, families, and health professionals into 2022 and beyond.

Conclusion

This project was conducted to support school communities exposed to both the 2019/2020 Black Summer bushfires and the COVID-19 pandemic. The research increased understanding of how disasters can affect school staff mental health and wellbeing and their capacity to support students with reduced wellbeing and school engagement. By collaborating with education, health, government and community sector partners it was possible to translate those findings into a whole of school approach to support and guide school staff, families, practitioners and government. The research outputs have been embedded in ongoing resources, changed policies and services that will continue to benefit school communities affected by current and future disasters. The findings about multiple disaster exposures highlighted that recovery experiences are different to single disaster exposure, particularly in relation to staff mental health and student wellbeing and school connection. They also demonstrated that further insights are needed into the additional complexities of coping with multiple disaster exposures in the context of climate change.

Appendix 1: DET staff and student 2021 wellbeing survey report



Student and Staff Wellbeing Surveys in Bushfire Affected Victorian Schools

Report from the University of Melbourne and Phoenix Australia to Victorian Department of Education and Training

December 2021

Phoenix AUSTRALIA
CENTRE FOR POSTTRAUMATIC MENTAL HEALTH

VICTORIA State Government | Education and Training

THE UNIVERSITY OF MELBOURNE

Acknowledgement: We are grateful for the contributions from the students, school staff, the Department of Education and Training Trauma Recovery team, and ORIMA colleagues to make this research possible in a shared commitment to supporting the wellbeing of school communities after the experience of the Black Summer bushfires. We also gratefully acknowledge the research funding received from the Victorian Department of Education and Training and the Teachers Health Foundation, and the expert advice and insights received from the University of Melbourne Children and Disasters Advisory Committee.

Suggested report citation: Leppold C, Cowlishaw S, Baur J, Burns A, Meagher N, Kartal D, Nursey J, Ulubasoglu M, Ballard N, Cesur R, Tekin E, Watterston J, Cobham V, Marinkovic K, Tong L.A, Gibbs L. Student and Staff Wellbeing Surveys in Bushfire Affected Victorian Schools. Report from University of Melbourne and Phoenix Australia to Victorian Department of Education and Training. December 2021.

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Executive summary

In 2019-20, the Black Summer Bushfires affected large parts of Victoria and were almost immediately followed by the COVID-19 pandemic. This report presents findings from surveys of staff and students in bushfire-affected schools, which comprised a project that was commissioned by the Victorian Department of Education and Training (DET) Bushfire Trauma Recovery Team and carried out by a research team from the University of Melbourne and Phoenix Australia Centre for Posttraumatic Mental Health with a multi-disciplinary group of co-investigators.

There were 127 schools in bushfire-affected areas across Outer Gippsland and Ovens Murray that were eligible to participate in the surveys. The surveys were administered from October - November 2021, and 125 staff and 525 students from 10 schools participated. School staff included principals, assistant principals, teachers, and those in student support roles or administrative roles. Descriptive statistics were used to examine wellbeing levels for staff and students, drawing on established scales (PERMA profiler, K6, EPOCH), with the main focus being the comparison between (a) schools with different levels of bushfire impact, and (b) general population norms for specific measures (where available). There was also a secondary focus on possible implications of experiences associated with the COVID-19 pandemic.

This report identifies discernible differences in wellbeing and distress levels in bushfire-affected schools, when all schools are compared to general population figures.

- For staff, this was reflected in higher levels of psychological distress in participating bushfire affected schools, when compared to general Australian population norms (mean K6 score of 12.47 compared to 8.7). Although there was no statistically significant difference in overall staff wellbeing scores, there were two wellbeing subscales which were modestly higher for all staff from participating bushfire-affected schools, relative to general population norms (pre-COVID-19), and these suggest potentially increased sense of supportive relationships and purpose in life.

- For students, the differences were reflected in lower wellbeing in the survey sample, compared to general Australian and American population norms (mean EPOCH score of 3.36 compared to 3.63). There were also significantly lower levels of engagement, perseverance, optimism and happiness among students in the survey sample, compared to general population figures, with secondary students in years 7-9 at bushfire affected schools having lowest absolute scores. School connectedness scores were also modestly lower (by 7-8%) in primary school students from bushfire affected areas, compared to the wider Victorian primary school population scores from 2020, and markedly lower (by 26-29%) for secondary school students in bushfire impacted schools compared to the wider Victorian secondary school population scores from 2020.

Importantly, this report finds no significant differences in wellbeing or distress levels between respondents in schools with high or low levels of bushfire impact, except for a modestly higher level of perseverance for primary students in schools with high or

extreme bushfire impacts, compared to schools with lesser bushfire impact. As such, the survey results suggest that the whole sample across *all bushfire impact levels* faced greater distress (staff), and lower wellbeing and school connectedness (students) than the general population. In post-disaster studies, it is common to find differences in mental health and wellbeing outcomes based on levels of bushfire impact (with higher impact associated with lower mental health and wellbeing levels), however this trend was absent in the current survey results. This may be due to benefits from support programs provided to schools with higher levels of bushfire impact that is bringing them more in line with lower impacted schools. It is also likely to be a result of the cumulative impacts of bushfires and the pandemic on all of the schools, exacerbating challenges. Notwithstanding the absence of significant differences between lower and high impact schools, the findings highlight particular causes for concern about staff psychological distress and student wellbeing, particularly secondary students, in all bushfire affected regions.

This report additionally presents a range of more detailed findings for staff and students. For example:

- This report finds that **staff** reporting work- or family-related stress due to COVID-19 were likely to have lower wellbeing scores. Furthermore, all staff also reported concerning absolute levels of bullying, burnout, absenteeism and presentism (i.e. coming to work despite mental health problems or illness), along with other psychosocial issues that may include possible alcohol use problems and intimate partner violence exposure.

- **Staff** also reported that the most common sources of support for wellbeing issues were informal, and included support from family, friends, and critically also other school colleagues.

- This report finds that **students** in years 7-9, students who identified as gender non-binary or other gender, were living with a disability, or felt unsafe with their families, had significantly lower wellbeing scores.

- **Students** also described ways that schools should support students after bushfires, and most suggested that schools should provide 'someone to talk to about things that are worrying you'.

At the time of this survey, nearly two years after the Black Summer Bushfires, these findings suggest a need to provide long-term support to all schools in bushfire affected areas. Prior research has found that bushfire recovery can last for years or decades, and short-term interventions may not be sufficient. This is particularly the case in the current circumstances where there have been cumulative effects of the bushfires and the pandemic. Based on the present survey findings, this report makes the following recommendations to DET:

- Prioritise future wellbeing and psychological distress monitoring over time across all school communities in Victoria, including non-bushfire-affected schools, in order to facilitate improved understanding of unfolding impacts of the COVID-19 pandemic alone, and when additional to the Black Summer Bushfire impacts.

- Continue to provide a range of recovery support options that recognise staff resilience, but also address potential ongoing psychosocial challenges for all schools across bushfire-affected areas, regardless of whether each school has had 'high' or 'low' impacts. These options may include programs that aim to reduce psychosocial challenges (e.g., bullying), improve early identification and disclosure of psychological distress or wellbeing issues, and support emotional preparedness including guidance for peer-to-peer support (e.g. 'accidental counsellor' training).

- Continue to provide a range of recovery support options that recognise student resilience, but also address potential ongoing psychosocial challenges for all schools across bushfire-affected areas, regardless of whether each school has had 'high' or 'low' impacts.

- Provide logistical support for all schools in bushfire affected regions to ensure trauma trained school staff or external professionals are available to directly support student wellbeing. This would action a response to students' nomination that after disasters, schools should provide 'someone to talk to about things that are worrying you'. Review additional support options nominated by student survey respondents to guide school and Department level support strategies.

- Provide guidance and resources to staff on how to identify and provide appropriate support and referrals for students showing ongoing symptoms of trauma.

Overall, this research finds significantly higher distress among staff and lower wellbeing among students in bushfire-affected schools, compared to general population norms. Due to limitations in the sampling frame of this project, the findings of this study should be seen as emerging rather than definitive. However, even as emerging findings, these results present an imperative for further action. Addressing wellbeing within school communities will be crucial to supporting recovery from both the Black Summer Bushfires and the COVID-19 pandemic. Continuing to monitor staff and student wellbeing across the State will also help to identify the additional complications of multi-disaster exposure.

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Background

Introduction

The increased incidence and severity of disasters is now recognised as inevitable across Australia. The impacts of disasters on affected individuals and communities can be profoundly difficult and life changing, with long-lasting impacts on the built and natural environment, as well as negative consequences for the emotional, social and economic health and wellbeing of survivors (AIDR, 2018). Existing evidence suggests that there is a higher risk of adverse mental health outcomes for both adults and children following a mass trauma event such as a disaster (Bonanno et al., 2010; Beaglehole et al., 2018). This can be caused by the experience of the trauma event, as well as secondary losses and disruptions that can arise in its aftermath. While most people who have experienced a disaster can expect to recover with support from family, friends and the community around them, a small number may go on to experience longer-term mental health problems and will need additional support (Bonanno et al., 2010; Peek, 2008).

Disasters can have particular impacts in schools, which are settings where staff and students can face disaster-related losses in their personal lives, as well as losses at the school level (e.g. loss of school buildings). After disasters, learning opportunities may be limited by school closures and disruptions in class due to student distress and behavioural difficulties (Sacerdote, 2008). Teachers may also experience uncertainty about how to provide appropriate support to students in this post-trauma environment, while also facing the impacts of trauma in their own lives (Alisic, 2012; Casserly, 2006). There is evidence that trauma experiences such as disasters can have neuropsychological impacts on children and young people, as reflected in difficulties with attention, working memory, processing speed, planning and problem solving (Parslow and Jorn, 2007; Turley and Obrzut, 2012; Barrera-Valencia et al., 2017). This can reduce learning and academic outcomes and lead to disruptive behavioural difficulties (Gibbs et al., 2019). At the same time, schools can be key sites for individual and collective disaster recovery initiatives (Mutch, 2014; 2015). There is a growing body of evidence on school-level interventions to support students following disasters (Fu and Underwood, 2015; Gibbs et al, in press), and a relative need for work on how to best support staff members at school following disasters.

In 2020, Victorian schools faced an unprecedented crisis when the 2019-20 Black Summer Bushfires were directly followed by the COVID-19 pandemic and related restrictions. Although these were two major and closely sequenced events, there has been limited assessment to date of staff and student wellbeing across schools affected by these disasters. In anticipation of new recovery programs and in order to gain information on current levels of student and staff wellbeing and support needs, DET led this survey of staff and students from bushfire affected schools in Victoria.

The present study

This research aimed to commence monitoring the wellbeing and support needs of students and staff in Victorian schools affected by the 2019-20 Black Summer Bushfires. This project is led by the DET Bushfire Trauma Recovery Team. DET commissioned the

involvement of a University of Melbourne research team, and the Phoenix Australia: Centre for Posttraumatic Mental Health (affiliated with the Department of Psychiatry at the University of Melbourne), to contribute to survey design and data analysis, and ORIMA Research to contribute to data collection.

Methods

Sample

This research focuses on schools in areas affected by the 2019-20 Black Summer Bushfires. Schools in Ovens Murray and Outer Gippsland were eligible to participate in both the student survey (students in years 4-9 eligible) and the staff survey (all staff members eligible). Schools in these areas had a range of levels of bushfire impact, from nil to extremely severe, as detailed below. A total of 127 schools were eligible to participate.

Measures

Data collection involved two surveys: one distributed to school staff (staff survey), and one distributed to school students (student survey). Both surveys were developed by the University of Melbourne team and Phoenix Australia team and co-investigators, through discussion with the DET Trauma Recovery Team, Bushfire Recovery Officers, and the University of Melbourne Children & Disasters Advisory Committee.

Staff survey measures

The Staff Wellbeing Check included questions about demographics, career profile, wellbeing, mental health, disaster exposure (including COVID-19 impacts) and job experiences. The survey drew from widely used and validated measures of wellbeing in adults (PERMA profiler) and mental health (K6), as well as items from the Beyond Bushfires post-disaster survey.

Student survey measures

The Student Wellbeing Check included questions about demographics, wellbeing and health, family environment, resilience, and hope. The surveys drew on measures that have been validated and are used widely to assess wellbeing in children and teenagers (including the EPOCH measures). New questions on disaster recovery were also developed by the research team, asking students about the types of support they see as most important within schools following bushfires. The student survey did not include any direct questions about bushfire-related experiences, and instead focused on wellbeing and hope for the future.

Bushfire impact

This research draws on existing school-level measures of bushfire impact held by DET. In January 2020, DET sent a survey to principals of all schools in Local Government Areas (LGAs) declared to be in State of Disaster due to bushfires. This Impact Assessment Survey examined the impacts of bushfires primarily in terms of damage to infrastructure and psychological damage to staff and students. This survey was used to rapidly assess the situation before schools re-opened. A DET panel reviewed all survey responses and

categorised schools in relation to overall impact severity scores which correspond to levels in the School Management Incident System (SIMS). These scores range from nil to extreme severity of impact. Schools that did not respond were assumed to have no impacts. Schools in areas with known impacts but which did not respond were followed-up until a response could be elicited.

This project thus draws mainly on existing school-level data on bushfire impacts in analysis of staff and student surveys, and includes examination of differences in wellbeing across schools with different levels of bushfire impact.

Recruitment and Data Collection

Recruitment and data collection took place between October– November 2021. As the first step of recruitment and data collection, information about the survey was sent out to all eligible schools via DET communications, followed by an information sheet and link to a participation portal managed by ORIMA research. Principals were then able to express interest in having their school participate in the staff survey, student survey, or both. The DET Trauma Recovery Team provided support to schools in this period and assisted with any issues in accessing the online survey portal.

DET and ORIMA administered the student survey, while the Phoenix Australia team administered the staff survey. The decision for Phoenix Australia to collect and manage staff survey data, rather than DET and ORIMA, was made in order to minimise any concerns over privacy or confidentiality by staff (including reluctance to answer mental health questions if data was accessible to DET). Upon principal consent, surveys were administered as detailed below.

Staff surveys

Twenty-one schools expressed interest in the staff survey and provided contact details for a nominated survey administrator. The survey link was distributed to these schools by the Phoenix team and the surveys were conducted completely online through the REDCap online platform.

The staff survey participation was entirely voluntary and anonymous. The landing page of the survey included an information sheet and consent form. Only staff who provided consent then progressed to the full online survey.

Student surveys

Thirteen schools expressed an interest in the student survey and were given access via the ORIMA online portal. Surveys were then conducted through the ORIMA online platform during class time.

The student survey was entirely voluntary for both parents and children. An opt-out approach was taken to parental consent, nominated by the DET Trauma Recovery Working Group as the preferred option following consultation with principal networks in eligible areas. This consultation found that principal networks had a strong preference for an opt-out approach to parental consent, in order to reduce burdens on schools and families who were already feeling overwhelmed by bushfire recovery impacts and processes.

Parents were notified about the survey through multiple channels of communication, at least twice before the survey began (with first communication at least two weeks in advance of survey commencing). All communications to parents included details about the project, and instructions on how to opt-out if parents did not wish for their child to participate. On the day of the survey, students were introduced to the survey and verbally informed that participation was voluntary, and that they could choose not to answer any or all of the questions. Separate in-class activities were prepared for students who did not wish to participate in the surveys. Data collection only proceeded in cases where a) parents had not opted-out, and b) the student(s) also chose to participate.

Data analysis

Analyses were conducted using Program R (version 3.5) and JASP (version 0.15). Descriptive statistics were produced and comprised means and standard deviations for continuous demographic and outcome measures, as well as frequencies for responses across categorical variables. Key outcome measures were wellbeing levels for staff and students. Aggregate scale scores were formed for established scales (PERMA profiler, K6, EPOCH) to derive measures of wellbeing and secondary outcomes including burnout, workplace experiences and help-seeking behaviour.

Bushfire impact was coded as a binary variable for both staff and students. The patterns of bushfire exposures differed slightly between participating staff and students, and were coded as follows. For staff, participants from low (*n* = 52) and moderate (*n* = 1) exposure schools were grouped together to form the "low/moderate" group, while participants from high exposure (*n* = 72) schools forming the "high" comparison group. For students, there were no participants from low exposure schools. Participants from nil (n = 91) and moderate (n = 113) schools were grouped together to form the "less than high or extreme" group, and participants from high exposure (n = 202) or extreme exposure (n = 120) schools were grouped together to form the "high or extreme" group.

Between bushfire impact groups, comparisons on wellbeing scores and secondary outcome measures were conducted using independent samples *t-tests* for continuous outcomes and chi-square tests for categorical outcomes; with Cohen's *d* and odds ratios reported as corresponding effect sizes. The final part of the staff survey analyses examined whether individual reports of bushfire impact and COVID-19 related stress were associated with wellbeing. For all analyses, cell sizes less than 5 were suppressed to protect anonymity.

Technical note: Small sample sizes

Small samples mean that figures from the current survey will be affected by sampling error. This means that while sample-specific *estimates* provide a 'best guess' (e.g., the proportion of all staff with probable serious mental illness), there is *uncertainty* in this guess which becomes greater as samples become smaller. This is because small samples provide less information and confidence in the best guess. Confidence Intervals (CIs) help to quantify this uncertainty.

For example, the rate of probable serious mental illness on the K6 in staff was 7.2%, which given the sample size was associated with a CI ranging from 3.3% to 13.2%. This means that while the best guess of all staff with probable serious mental illness is 7.2%, the true value (with 95% confidence) could be from 3.3% to 13.2%.

Ethics

This research was exempt from the DET ban on research in schools in 2021. Ethics approval for this study was granted by the University of Melbourne Human Ethics Advisory Group (HEAG) (ref: 2021-20873-16920-4) and the DET Research in Schools and Early Childhood settings (RISEC) board (ref: 2021_004357).

Results Part A: Staff Survey

There were 125 participants that completed the staff survey, from 10 different schools. There were 52 (41.6%) participants from 2 low bushfire impact schools, 1 (0.8%) participant from a moderate impact school, and 72 (57.6%) participants from 7 high bushfire impacts schools. The participants from the low and moderate impact schools were combined to create a predominantly low bushfire impact group, which was compared to the high bushfire impact group.

3.1 Sociodemographic and employment characteristics

Table 1 and 2 present sample sociodemographic and employment characteristics. The mean age of the sample was 44.68. They had worked an average of 8.90 years at their current school, and 15.29 years in the education system.

Women comprised 76.8% of participants, with 22.4% that were men, and <1.0% that were non-binary. Almost three quarters (72.0%) of the sample were married or in a de-facto relationship. There were 52.0% that reported being childless, 4.0% had children aged 0-2 years, 9.6% had children aged 3-5 years, 32.0% had children aged 6-12 years, and 24.0% had children aged 13-18 years. A Doctoral or Masters degree was reported by 14.4% of participants as their highest education, while 34.4% reported a Bachelor or Bachelor (Honours) degree, 33.6% reported a Graduate Diploma or Certificate, 8.0% a Diploma or Advanced Diploma, and 6.4% reported a High school certificate. Less than 5% of participants identified as Aboriginal or Torres Strait Islander, and 10.4% were born outside Australia. The majority of the sample was made up of Teachers (71.2%), followed by those in a Student support role (11.2%). There were 64.8% employed full-time and 81.6% employed on a permanent basis.

Table 1. Staff sample sociodemographic and employment characteristics

	Mean	SD
Age	44.68	10.54
School tenure	8.90	8.38
Total tenure	15.29	10.24

Table 2. Staff sociodemographic and employment characteristics

	n	%
Gender		
Female	96	76.8
Male	28	22.4
Non-binary	< 5	NA
Relationship status		
Married or de-facto	90	72.6
Not in a relationship	34	27.4
Children		
None	65	52.0
Aged 0-2 years	5	4.0
Aged 3-5 years	12	9.6
Aged 6-12 years	40	32.0
Aged 13-18 years	30	24.0
Highest education		
Doctoral or Masters degree	18	14.4
Graduate Diploma or Certificate	42	33.6
Bachelor or Bachelor (Honours) degree	43	34.4
Diploma or Advanced Diploma	10	8.0
High school certificate	8	6.4
Other	< 5	NA
Country of Birth		
Australia	112	89.6

Outside Australia (an English speaking country)	13	10.4
Position (job role)		
Principal or Assistant principal	11	8.8
Lead teacher/Teacher Specialist or Teacher	89	71.2
Student support role	14	11.2
Administrative role	9	7.2
Wellbeing support position	6	4.8
Employment status		
Full-time (more than 90% of full-time hours)	81	64.8
Part-time (50-90% of full-time hours)	44	35.2
Contract		
Permanent employment (an on-going contract with no fixed end-point before the age of retirement)	102	81.6
Fixed-term contract for a period of more than 1 school year	14	11.2
Fixed-term contract for a period of 1 school year or less	7	5.6
Casual/relief	< 5	NA

Note: Participants could have endorsed multiple categories for the children and position (job role) items.

3.2 Staff wellbeing profiles

PERMA Wellbeing

Twenty items of the PERMA profiler (Butler & Kern, 2016) were used to asses general wellbeing. Participants responded on a scale from 0 'Never/Not at all' to 10 'Always/Completely'. Mean scores for items on each subscale were calculated, and an overall wellbeing score was created.

Table 3 presents the mean wellbeing scores for the sample by school bushfire impact (low, high), and also compared to a population mean. The low bushfire impact group reported slightly higher scores on the PERMA relationships subscale compared to the high impact group; however, this difference was not significant and was associated with

a small effect size. There were no significant differences between groups in overall wellbeing or any of the other PERMA subscales, and effect sizes were approaching zero.

Compared to general Australian population norms (pre-COVID), the survey sample showed slightly higher overall wellbeing. However, this difference was non-significant and characterised by a small effect size. The PERMA subscale scores were also similar to the general population, with the exception of Relationships and Meaning, where the survey sample showed significantly higher scores. The Relationships subscale refers to feeling loved, supported, and valued by others. The Meaning subscale refers to having a sense of purpose in life, a direction where life is going, feeling that life is valuable and worth living, or connecting to something greater than ourselves, such as religious faith, a charity or a personally meaningful goal (Butler & Kern, 2016). Both these differences were small in effect, and suggest modestly increased wellbeing in the current survey sample, relative to the general Australian population.

Table 3. Mean PERMA wellbeing subscales by bushfire impact compared to the general population mean

	Bushfire impact		Effect size (Cohen's *d*) (95% CI)	Total sample	General population	Effect size (Cohen's *d*) (95% CI)
	Low (n = 53)	High (n = 72)		(n = 125)	(n = 2593)	
	M (SD)	M (SD)		M (SD)	M (SD)	
Overall wellbeing	7.29 (1.34)	7.20 (1.21)	0.07 (-0.29, 0.42)	7.24 (1.26)	7.03 (1.62)	0.15 (-0.03, 0.32)
Positive emotion	6.84 (1.64)	6.77 (1.53)	0.04 (-0.32, 0.40)	6.80 (1.57)	6.68 (1.94)	0.05 (-0.13, 0.23)
Engagement	7.18 (1.52)	7.07 (1.41)	0.07 (-0.28, 0.43)	7.12 (1.45)	7.29 (1.68)	-0.11 (-0.28, 0.07)
Relationships	7.70 (1.77)	7.43 (1.64)	0.16 (-0.20, 0.51)	7.54 (1.69)	6.90 (2.12)	0.31 (0.13, 0.48)**
Meaning	7.65 (1.64)	7.66 (1.49)	-0.01 (-0.36, 0.35)	7.65 (1.55)	7.05 (2.12)	0.26 (0.09, 0.44)*
Accomplishment	7.13 (1.48)	7.10 (1.52)	0.02 (-0.34, 0.38)	7.12 (1.50)	7.26 (1.74)	-0.11 (-0.28, 0.07)
Negative emotion	4.41 (1.9)	4.34 (1.85)	0.04 (-0.32, 0.39)	4.37 (1.86)	4.33 (1.99)	0.04 (-0.14, 0.21)

Loneliness	3.74 (2.70)	3.68 (2.77)	0.02 (-0.34, 0.38)	3.70 (2.73)	4.13 (3.04)	-0.14 (-0.32, 0.04)

** P value* 0.003

*** P value* <0.001

Note: All norms presented are from the Australian sample, except for Loneliness which was taken from the main norming set (n = 23,692) as it was not available for the Australia/New Zealand sample (n = 2593).

K6 Psychological Distress

General psychological distress was measured using the K6 (Furukawa, Kessler, Slade, & Andrews, 2003). The K6 asks participants how often they have experienced 6 symptoms of distress in the past 30 days on a scale from 1 'None of the time' to 5 'All of the time'. Items are summed, and a cut-off score of 19+ indicates psychological distress.

Table 4 presents the mean psychological distress of the sample by school bushfire impact (low, high), and also when compared to the general population mean. Results showed potentially higher psychological distress in the high impact group; however, this difference was not significant and was associated with a small effect size.

Compared to general population figures from the 2007 Australian National Survey of Mental Health and Wellbeing (Furukawa et al., 2003), the overall survey sample reported significantly higher mean psychological distress. This effect was large, indicating an important difference.

There were 5.7% of the low impact group and 8.3% of the high impact group that scored above the cut-off of 18 on the K6, indicating probable mental illness. These figures compare to rates of 6.5% and 8.9% recorded in low impact and high impact communities, respectively, surveyed 3-4 years after the Black Saturday bushfires (Bryant et al, 2021). For the overall sample in this study, the proportion was 7.2% (n = 9), which is higher than the 6.1% reported in the Australian Capital Territory General Health Survey in 2019 (ACT Government, 2021).

Table 4. Mean K6 psychological distress by bushfire impact compared to the general population mean

	Bushfire impact		Effect size (Cohen's *d*) (95% CI)	Total sample	General population	Effect size (Cohen's *d*) (95% CI)
	Low	High		(n = 125)	(n = 8841)	
	M (SD)	M (SD)		M (SD)	M (SE)	
Psychological distress	12.13 (3.58)	12.72 (4.05)	-0.15 (-0.51, 0.20)	12.47 (3.85)	8.7 (0.01)	1.01 (0.79, 1.22)*

** P value <0.001*

Psychosocial risk factors

Brief screening measures for a range of post-disaster psychosocial risk factors were assessed, and these included alcohol use, illegal and prescription drug use, intimate partner violence exposure, anger, sleep difficulties, and gambling problems.

A selection of questions from the Case-finding & Help Assessment Tool (CHAT) (Goodyear-Smith et al., 2008) were used to assess alcohol use, anger and sleep. All CHAT items were answered on a yes/no scale.

Illegal and non-medical prescription drug use was assessed using a single item screening question (McNeely et al., 2015).

A single item from the Problem Gambling Severity Index (PGSI) (Ferris & Wynne, 2001) was used to assess gambling problems on a 5-point rating scale which extended from 'Never' to 'Always'. This item was further dichotomised to no (never) and yes (all other options).

Intimate Partner Violence (IPV) exposure was assessed by a single item on a yes/no response scale (Brown et al., 1996).

Table 5 presents frequencies for self-reported psychosocial risk factors by bushfire impact. Around 35% of participants in the high bushfire impact group and 29% of participants in the low impact group felt the need to cut down on their drinking. This difference was not statistically significant. However, those with high school bushfire impact (45.1%) were 2.67 times more likely that those with low impact (23.5%) to report that they had drunk more than they meant to in the past year.

The remaining psychosocial risk factors were similar across both school bushfire impact groups. Mean number of times participants used an illegal drug or used a prescription medication for non-medical reasons in the past year was less than 1. Additionally, very small numbers reported feeling guilty about the way they gamble or what happens when they gamble in the past year. However, around 14% of both impact groups

reported feeling frightened by what their partner (or ex-partner) has said or done. Approximately 25% of the low impact and 20% of the high impact group reported that controlling their anger had sometimes been a problem for them. Over half of both groups (around 67% of the low impact group and 49% of the high impact group) reported they had trouble with their sleeping (on at least 3 nights per week) such that it interfered with their activities the following day.

Table 5. Frequencies of reported psychosocial risk factors by bushfire impact

	Bushfire impact			OR (95% CI)
	Low	High	Total	
	n (%)	n (%)	n (%)	
Alcohol use				
Do you ever feel the need to cut down on your drinking alcohol?	15 (29.4)	25 (35.2)	40 (32.8)	1.30 (0.60, 2.83)
In the last year, have you ever drunk more alcohol than you meant to?	12 (23.5)	32 (45.1)	44 (36.1)	2.67(1.20, 5.94)*
Drug use (M, SD) (Cohen's d (95% CI))				
How many times in the past year have you used an illegal drug or used a prescription medication for non-medical reasons?	0.52 (3.00)	0.37 (1.71)	0.43 (2.32)	0.07 (-0.30, 0.43)
Gambling				
In the last year, have you felt guilty about the way you gamble or what happens when you gamble?	5 (9.8)	< 5 (NA)	8 (6.6)	0.41 (0.09, 1.78)
Intimate Partner Violence (IPV)				
Did you ever feel frightened by what your partner (or ex-partner) has said or done?	7 (13.7)	10 (14.3)	17 (14.1)	1.05 (0.37, 2.97)
Anger				
Has controlling your anger sometimes been a problem for you?	13 (25.5)	14 (19.7)	27 (22.1)	0.72 (0.30, 1.70)
Sleep				

Have you had trouble with your sleeping (on at least 3 nights per week) such that it interfered with your activities the following day?	34 (66.7)	49 (69.0)	83 (68.0)	1.11 (0.52, 2.40)

** P Value = 0.015*

3.3 Workplace factors

Copenhagen Psychosocial Questionnaire (COPSOQ)

Workplace conditions were assessed using questions from the Copenhagen Psychosocial Questionnaire (COPSOQ) (Burr et al., 2019). Twenty-four items were selected for inclusion across subscales. Responses are presented on scales ranging from 0 to 100. Where multiple items formed a subscale, the mean of items is presented. Responses for negative workplace acts (cyber bullying, threats, violence, bullying subscales) were dichotomised (thus indicating numbers of respondents that reported exposures a few times, or more frequently).

Table 6 presents mean COPSOQ subscale scores by bushfire impact. The effect size estimates indicated that the largest differences between groups were for quantitative demands and emotional demands, where the low impact group reported workplaces that were slightly more demanding. However, these differences were not statistically significant and were still associated with small effect sizes. None of the other subscales significantly differed by school bushfire impact, and all had effect sizes approaching zero.

Table 6. Mean COPSOQ subscale scores by bushfire impact

		Bushfire impact		Effect size (Cohen's *d*) (95% CI)
COPSOQ subscale	Total M (SD)	Low M (SD)	High M (SD)	
Demands at work				
Quantitative demands	60.68 (24.63)	65.10 (21.41)	57.61 (26.36)	0.31 (-0.07, 0.68)
Work pace	69.12 (21.06)	69.27 (20.30)	69.02 (21.72)	0.01 (-0.36, 0.38)
Emotional demands	69.98 (21.84)	73.70 (22.07)	67.39 (21.46)	0.29 (-0.08, 0.66)

Work organisation and job contents				
Influence at work	53.63 (26.52)	52.6 (28.36)	54.35 (25.35)	-0.07 (-0.43, 0.3)
Predictability	58.55 (23.25)	59.38 (25.07)	57.97 (22.07)	0.06 (-0.31, 0.43)
Quality of leadership	63.89 (27.55)	64.58 (26.21)	63.41 (28.63)	0.04 (-0.33, 0.41)
Social support from supervisor	55.13 (25.75)	56.77 (25.65)	53.99 (25.95)	0.11 (-0.26, 0.48)
Social support from colleagues	64.32 (22.1)	64.06 (19.91)	64.49 (23.64)	-0.02 (-0.39, 0.35)
Sense of community at work	73.29 (21.71)	71.88 (23.98)	74.28 (20.1)	-0.11 (-0.48, 0.26)
Work-individual interface				
Commitment to the Workplace	65.81 (30.9)	67.19 (32.68)	64.86 (29.8)	0.08 (-0.29, 0.44)
Job insecurity	12.82 (23.12)	15.10 (28.59)	11.23 (18.46)	0.17 (-0.20, 0.54)
Job satisfaction	72.44 (23.3)	71.88 (26.11)	72.83 (21.33)	-0.04 (-0.41, 0.33)
Work life conflict	51.28 (33.85)	51.82 (33.62)	50.91 (34.25)	0.03 (-0.34, 0.40)
Self-rated health	58.20 (26.00)	54.90 (23.99)	60.56 (27.28)	-0.22 (-0.58, 0.14)

Table 7 presents frequencies of Negative workplace acts by bushfire impact. Bullying experiences were reported by 25.9% of the total sample, and rates did not differ between bushfire impact groups. There were no other significant differences across groups, although trends suggested higher proportions of staff from the high impact group (22.1%) that reported cyber bullying (when compared to the low impact group; 14.6%), while lower proportions of staff from the high impact group reported experiencing threats of violence (13.2%) when compared to the low impact group (22.9%).

Table 7. Frequencies of reported COPSOQ Negative workplace acts by bushfire impact

				OR (95% CI)
	Total	**Low**	**High**	

COPSOQ subscale	n (%)	n (%)	n (%)	
Cyber bullying	22 (19.0)	7 (14.6)	15 (22.1)	1.29 (0.80, 2.16)
Threats of violence	20 (17.2)	11 (22.9)	9 (13.2)	0.72 (0.44, 1.16)
Physical violence	12 (10.3)	8 (16.7)	< 5 (NA)	0.56 (0.25, 1.03)
Bullying	30 (25.9)	13 (27.1)	17 (25.0)	0.95 (0.62, 1.45)

Burnout

Burnout was assessed using 2 items from the Maslach Burnout Inventory - Human Services Survey (MBI-HSS); one measuring emotional exhaustion (I feel burned out from my work) and the other measuring depersonalization (I have become more callous toward people since I took this job) (Li-Sauerwine, Rebillot, Melamed, Addo, & Lin, 2020; Maslach, Jackson, & Leiter, 2016). Participants responded on a 7-point scale from 0 'Never' to 6 'Everyday'. A participant is considered 'burned out' if they report > 3 on the summative score of the 2 questions.

Table 8 presents mean burnout total scores by bushfire impact. Mean burnout scores were around 4 (out of a possible 12) for both groups, and they did not differ according to bushfire impact. There were 58.3% (n = 28) that had a summative score of more than 3 in the low bushfire impact group, and 56.7% (n = 38) in the high impact group.

Table 8. Mean burnout total scores by bushfire impact

	Bushfire impact			Effect size (Cohen's *d*) (95% CI)
	Low	High	Total	
	M (SD)	M (SD)	M (SD)	
Burnout	4.27 (2.84)	4.30 (2.76)	4.29 (2.78)	-0.01 (-0.38, 0.36)

Absenteeism and Presentism

Absenteeism and presentism were assessed using single items asking participants how many working days in the last 3 months they (a) had to take leave because of illness or injury, including mental health problems or illness, and (b) came to work through illness or injury, including mental health problems or illness (Collins et al., 2018).

Table 9 presents mean absenteeism and presentism in the last 3 months by bushfire impact. In the last 3 months, both the low and high bushfire impact groups reported an average of 2 days where they took leave because of illness or injury, including mental

health problems. In terms of presenteeism, the low bushfire impact group came to work despite being ill or injured, including mental health problems, an average of 6 days in the last 3 months, while the high impact group did so an average of 8.5 days. This difference was not statistically significant and was associated with a small effect size.

Table 9. Mean absenteeism and presentism as a result of illness or injury, including mental health problems, in the last 3-months by bushfire impact

		Effect size (Cohen's *d*) (95% CI)		
	Total	Low	High	
	M (SD)	M (SD)	M (SD)	
Number of days took leave because of illness or injury, including mental health problems	2.25 (5.39)	2.02 (3.00)	2.41 (6.59)	-0.07 (-0.44, 0.30)
Number of days came to work despite being ill or injured, including mental health problems	7.55 (14.64)	6.13 (9.68)	8.54 (17.27)	-0.17 (-0.53, 0.21)

3.4 Help-seeking

Help-seeking was assessed by asking whether respondents had used any of the 10 strategies or resources to manage difficult times, or improve mental health or wellbeing, in the past 12 months. Table 10 reports relevant frequencies by bushfire impact, and shows patterns which were similar across low and high impact groups. The exception was for accessing services through bushfire Community Recovery Hubs, which was most commonly reported in the high impact group. In absolute terms, the most common strategies for both groups were all informal, and included: asking for support from family or friends, increasing physical activity, asking for support from co-workers or supervisors, and using the internet to get help or information. However, there were also non-trivial numbers of staff (more than 25%) that reported accessing some formal help services, including GPs, mental health professionals, and the school EAP. In contrast, few respondents (<10%) reported using national or regional telephone helplines.

Table 10. Frequencies for use of support / help-seeking strategies by bushfire impact

		OR (95% CI)

	Total	Low	High	
	n (%)	n (%)	n (%)	
Use the internet to get help or information about mental health or wellbeing	69 (55.2)	30 (56.6)	39 (54.2)	0.91 (0.44, 1.85)
Participate in an online self-help program	33 (26.4)	12 (22.6)	21 (29.2)	1.41 (0.62, 3.19)
Use national or regional telephone helplines (i.e. Lifeline, Mensline, Mindspot clinic, Relationships Australia, SANE Australia)	12 (9.6)	6 (11.3)	6 (8.3)	0.71 (0.22, 2.35)
Increase your level of exercise or physical activity	81 (64.8)	35 (66.0)	46 (63.9)	0.91 (0.43, 1.92)
Ask for advice or support from family or friends	83 (66.4)	35 (66.0)	48 (66.7)	1.03 (0.49, 2.18)
Ask for advice or support from co-workers or supervisor	74 (59.2)	30 (56.6)	44 (61.1)	1.21 (0.59, 2.48)
Visit your GP for an issue relating to mental health or wellbeing	47 (37.6)	20 (37.7)	27 (37.5)	0.99 (0.48, 2.06)
Visit a psychologist or another mental health professional	40 (32.0)	16 (30.2)	24 (33.3)	1.16 (0.54, 2.48)
Access the Employee Assistance Program (EAP) available through my school	30 (24.0)	15 (28.3)	15 (20.8)	0.67 (0.29, 1.52)
Access support services provided through bushfire Community Recovery Hubs	17 (13.6)	< 5 (NA)	15 (20.8)	6.71 (1.46, 30.77)*

** P value =0.006*

3.5 Impacts of individual experiences during and after bushfires

Disaster-related exposure and experiences were assessed using items from the Beyond Bushfires Study (Gibbs et al., 2013). Three items asked initially about exposures during and immediately after the 2019/20 Black Summer bushfires (living in a region directly affected, had property in a region directly affected, themselves or someone close at personal risk) on a yes/no response scale. A following item asked about the level of personal and business property or possession loss on a scale from 0 'Nothing' to 10 'Everything'.

Table 11 presents mean PERMA overall wellbeing scores according to these individual-level measures of bushfire experiences. These show no discernible differences in PERMA scores according to bushfire experiences, while all effect sizes were small or

approaching zero. There was no correlation between the amount of personal or business property or possession loss and PERMA overall wellbeing (*r*=0.01 (95% CI -0.17, 0.19)).

Table 11. Mean PERMA overall wellbeing by experiences during the bushfires

	No		Yes		Effect size (Cohen's *d*) (95% CI)
	M (SD)	n	M (SD)	n	
At the time of the bushfires, were you living in a region directly affected by the fires?	7.16 (1.31)	38	7.31 (1.24)	79	-0.12 (-0.50, 0.27)
Did you have property in a region affected by the bushfires?	7.16 (1.26)	62	7.37 (1.26)	55	-0.17 (-0.53, 0.20)
Were you or someone close to you at personal risk during the bushfires?	7.26 (1.43)	45	7.26 (1.15)	72	0.00 (-0.37, 0.37)

Participants were also asked five items about disaster-related experiences following the bushfires (lived in temporary accommodation, commenced rebuilding or decided to rebuild, relocated away from the local community, made an insurance claim, applied for a bushfire related grant) on a yes/no response scale. There was insufficient variability across three of these questions for purposes of meaningful analyses, as identified by < 15 respondents reporting relevant post-disaster experiences (for example, there were only n = 14 respondents that reported living in temporary accommodation). Table 12 presents mean PERMA overall wellbeing scores according to the remaining post-disaster experiences, which also show no discernible associations.

Table 12. Mean PERMA overall wellbeing by experiences following the bushfires

	No		Yes		Effect size (Cohen's *d*) (95% CI)
	M (SD)	n	M (SD)	n	
Did you make an insurance claim?	7.24 (1.26)	95	7.36 (1.29)	21	-0.09 (-0.56, 0.38)
Did you apply for a bushfire related grant?	7.19 (1.26)	84	7.46 (1.26)	32	-0.22 (-0.63, 0.19)

Finally, a series of items were also asked about other stressful experiences that had occurred since the bushfires (a further natural disaster, assault or violence, and change of income, employment status, occupation, accommodation, health or relationship), and responses were scored on a yes/no scale.

Table 13 presents mean PERMA scores by these stressful experiences, with the exception of having experienced an assault or violence which had insufficient variability, and these identified a number of significant associations. For example, respondents who reported changes in accommodation, health, or relationships since the bushfires, also tended to report lower wellbeing scores, and these associations were medium to large. In contrast, there was no evidence of discernible associations with wellbeing scores and changes in income, employment, or occupation.

Table 13. Mean PERMA overall wellbeing by personal experiences since the bushfires

	No		Yes		Effect size (Cohen's *d*) (95% CI)
	M (SD)		M (SD)		
Did you experience a natural disaster?	7.18 (1.27)	93	7.62 (1.21)	23	-0.35 (-0.81, 0.11)
Did you experience a change of income?	7.28 (1.24)	83	7.23 (1.35)	33	0.04 (-0.37, 0.44)
Did you experience a change of employment?	7.28 (1.28)	81	7.24 (1.23)	35	0.03 (-0.36, 0.43)
Did you experience a change of occupation?	7.25 (1.30)	98	7.35 (1.10)	18	-0.08 (-0.59, 0.42)
Did you experience a change of accommodation?	7.48 (1.14)	85	6.67 (1.41)	31	0.66 (0.24, 1.08)*
Did you experience a change of health?	7.47 (1.28)	81	6.80 (1.10)	35	0.55 (0.15, 0.95)*
Did you experience a change of relationship?	7.38 (1.16)	99	6.60 (1.63)	17	0.63 (0.11, 1.15)*

** P value <0.05*

3.6 Impacts of COVID-19

In addition to items about general events experienced post-disaster, there were further considerations of experiences of COVID-19, which were assessed by asking how much respondents had been impacted in five areas (health, financial stress, family-related stress, work-related stress, economic impacts on community) since the beginning of the

pandemic. Participants responded to each item on a 6-point scale ranging from 0 'Not at all' to 5 'To a high degree'.

Table 16 presents correlation coefficients involving the COVID-19 impact items and overall wellbeing scores as measured by the PERMA. As shown, the results showed small-to-moderate and negative associations involving both work- and family-related COVID-19 stressors and overall wellbeing, indicating that greater stress in these domains was correlated with poorer wellbeing. All other associations were small and non-significant.

Table 16. Correlations between health, financial, family, work and economic-related COVID-19 impacts and PERMA overall wellbeing

	Correlation
	Pearson's *r* (95% CI)
Health impacts of COVID-19	-0.13 (-0.30, 0.06)
Financial stress due to COVID-19	0.05 (-0.13, 0.23)
Family-related stress due to COVID-19	-0.22 (-0.38, -0.03)*
Work-related stress due to COVID-19	-0.36 (-0.51, -0.19)**
Economic impacts on my community due to COVID-19	-0.07 (-0.25, 0.12)

** P value < 0.05*

*** P value < 0.001*

Results Part B: Student Survey

Of the 127 schools and 10,622 students that were eligible, there were 526 students from 10 schools who participated in the survey (response rate = 5%). One student was excluded from analysis because their year level was missing, leading to a total sample of 525 considered in analysis. There were 90 (17.1%) participants from 1 nil-impact school, 113 (21.5%) participants from 3 moderate-impact schools, 202 (38.5%) participants from 3 high-impact schools, and 120 (22.9%) participants from 2 extreme-impact schools. Participants from nil (n = 90) and moderate (n = 113) schools were grouped together to form the "less than high or extreme" group, and participants from high exposure (n = 202) or extreme exposure (n = 120) schools were grouped together to form the "high or extreme" group.

4.1 Sociodemographic characteristics

There were seven primary schools, one secondary school, and two P-12 schools in the final sample. From these schools, there were 337 students from grades 4-6 and 188 students from years 7-9 who participated in the survey. Seven out of the ten schools were in towns with a SEIFA score of 3 or less (where 1 is most disadvantaged and 10 is least disadvantaged), indicating that the majority of schools in this sample were in areas with high area-level socioeconomic disadvantage.

Table 17 presents the sociodemographic characteristics of the student sample. There was a fairly even split between boys (48.4%) and girls (46.9%), with a small group of students who identified as non-binary or other gender (4.4%). Students in year 4 (23.4%) and year 6 (23.6%) were more represented than other year levels in the overall sample. There were 8.0% of students who identified as Aboriginal or Torres Strait Islander. The majority of students (97.1%) spoke English at home. There were 19.2% of students who were identified as having a self-reported disability.

Table 17. Characteristics of student participants

	n	%
Gender		
Boy	254	48.4%
Girl	246	46.9%
Non-binary	6	1.1%
Other	18	3.4%
Prefer not to say	<5	N/A
Year Level		
Year 4	123	23.4%

Year 5	90	17.1%
Year 6	124	23.6%
Year 7	54	10.3%
Year 8	66	12.6%
Year 9	68	12.9%
Aboriginal and/or Torres Strait Islander		
No	413	78.7%
Yes	42	8.0%
Unsure	65	12.4%
Prefer not to say	<5	N/A
Language spoken at home		
English	510	97.1%
Language other than English	15	2.9%
Self-reported disability†		
No	373	70.9%
Yes	101	19.2%
N/A	51	9.7%

†Disability reported as 'yes' if students directly answered yes to the direct question 'do you have a disability?' or reported 'a lot of difficulty' or 'unable to do 'for tasks related to seeing, hearing, walking, concentrating, performing daily tasks or communication from Washington Group Short Set questions. Self-reported disability status was not able to be determined for some participants due to one or more missing or 'prefer not to say' responses.

4.2 Student wellbeing profiles

EPOCH Wellbeing

The twenty-item EPOCH measure of adolescent wellbeing (Kern et al., 2016) was included to assess general wellbeing. Participants responded on a scale from 1 (almost never / not at all like me) to 5 (almost always / very much like me). The EPOCH measure focuses on four domains of Engagement, Perseverance, Optimism, Connectedness and Happiness, with four questions per domain. The mean scores of items in each domain were calculated, as well as an overall EPOCH wellbeing score, where 5 is the highest marker of wellbeing and 1 is the lowest.

Table 18 presents the mean EPOCH wellbeing scores for the sample by bushfire impact (less than high or extreme, and high or extreme), for primary and secondary students. The total sample was also compared to a general population mean.

For primary students, there were no significant differences in EPOCH wellbeing domain scores or overall wellbeing between the two bushfire impact groups, except for the perseverance domain where students in schools with high or extreme bushfire impacts showed higher mean perseverance score (mean 3.36 compared to mean 3.14). Although this was statistically significant, the effect size was small. Perseverance is defined here as referring to 'the ability to pursue one's goals to completion, even in the face of obstacles' (Kern et al., 2016: 5).

For secondary students, there were no significant differences in EPOCH wellbeing domain scores or overall wellbeing between the two bushfire impact scores. However, compared to primary students, secondary students had notably lower absolute scores across domains of engagement, happiness, optimism, connectedness and happiness, and overall wellbeing, regardless of bushfire impact level.

Compared to general population norms taken from pre-COVID Australian and American sample, the total student sample (both bushfire impact groups and all years together) had significantly lower wellbeing scores across EPOCH engagement, perseverance, optimism and happiness domains, and a significantly lower overall EPOCH wellbeing score (effect size -0.40, 95% CI -0.47, -0.28, p = <0.001).

Table 18. Student Mean Wellbeing Scores

	Primary (years 4-6)			Secondary (years 7-9)			Total sample	Comparative data (general population) †	Effect Size (Hedge's g) (95% CI)
	Less than high or extreme bushfire impact	High or extreme bushfire impact	Effect Size (Hedge's g) (95% CI)	Less than high or extreme bushfire impact	High or extreme bushfire impact	Effect Size (Hedge's g) (95% CI)			
EPOCH Wellbeing Scores (mean, SD)									
Engagement	3.11 (0.947) N = 109	3.15 (1.02) N = 217	0.03 (-0.20, 0.26)	2.84 (0.908)	2.72 (0.978) N = 98	-0.13 (-0.42, 0.16)	3.01 (0.99) N = 513	3.30 (0.85)	-0.33 (-0.43, -0.24)*
Perseverance	3.14 (0.818) N = 110	3.36 (0.918) N = 217	0.24 (0.01, 0.47)**	2.84 (0.891)	2.99 (0.921) N = 98	0.16 (-0.13, 0.45)	3.15 (0.91) N = 515	3.56 (0.84)	-0.48 (-0.58, -0.39)*
Optimism	3.19 (0.874) N = 109	3.20 (0.938) N = 212	0.01 (-0.22, 0.25)	2.78 (0.905) N = 89	2.85 (0.941) N = 97	0.07 (-0.22, 0.36)	3.05 (0.94) N = 507	3.52 (0.90)	-0.52 (-0.61, -0.42)*
Connectedness	4.06 (0.862) N = 110	4.14 (0.766) N = 217	0.10 (-0.13, 0.33)	3.81 (0.866) N = 90	3.72 (0.970) N = 98	-0.10 (-0.39, 0.18)	3.99 (0.86) N = 515	4.01 (0.90)	-0.02 (-0.12, 0.07)
Happiness	3.68 (1.03) N = 109	3.80 (0.951) N = 217	0.13 (-0.10, 0.36)	3.29 (0.987) N = 90	3.24 (0.972) N = 98	-0.05 (-0.34, 0.24)	3.58 (1.01) N = 514	3.70 (0.97)	-0.13 (-0.22, -0.03)***
Overall EPOCH	3.44 (0.731) N = 108	3.56 (0.739) N = 206	0.16 (-0.07, 0.39)	3.11 (0.749) N = 88	3.11 (0.808) N = 97	0.00 (-0.23, 0.23)	3.36 (0.78) N = 499	3.63 (0.70)	-0.40 (-0.47, -0.28)*

* P-value <0.001
** P-value: 0.032
*** P-value: 0.010

†Comparison population is comprised of a sample of 2,882 adolescents aged 10-18 in the US and Australia, from Kern et al (2016 (supplement Table S3)).

‘I think I am doing pretty well’ and hope/optimism for the future

Table 19 presents the proportion of students in the sample who responded that they felt they were doing pretty well ‘a lot of the time’ or ‘all of the time’, and students who responded feeling optimistic/hopeful about their future.

There were no substantial differences between the two bushfire impact groups in the proportions of students who thought they were ‘doing well’. However, there were fewer secondary students reporting they felt they were doing well (38.9% in less than high or extreme impact group and 35.8% in high or extreme impact group), compared to primary students (54.9% in less than high or extreme impact group, and 53.1% in the high or extreme impact group).

There were differences between the proportions of students who felt optimistic or hopeful about their future by bushfire impact, however this reflected a contrasting pattern for primary and secondary students. That is, for primary students there were more students in schools with less than high or extreme bushfire impact who felt optimistic or hopeful about their future (72.6%) compared to students in schools with high or extreme impact (61.6%). For secondary students, this trend was reversed, with higher rates of optimism or hope for future in high or extreme bushfire impact schools (70.4%) compared to schools with less than high or extreme impact (60.0%).

The total sample overall had a lower proportion of optimism and hope for the future compared to comparative data of the same age range (65.3% in this study sample compared to 78.6% in comparative data from 2019). Caution is warranted when interpreting this result, as comparative data came from a sample that was of the same age range but skewed to have slightly more younger participants, and data was collected before the COVID-19 pandemic. The lower levels of hope and optimism in this sample may be due to both bushfire experience and experience of the COVID-19 pandemic, which the comparative sample did not have.

Table 19. Student perceptions of 'doing well' and optimism for the future

	Primary (years 4-6)		Secondary (years 7-9)		Total sample	Comparative data (general population) †
	Less than high or extreme bushfire impact	High or extreme bushfire impact	Less than high or extreme bushfire impact	High or extreme bushfire impact		N = 7118
'I think I am doing pretty well'						
Proportion of students who responded 'a lot of the time' or 'all the time' (n, %)	62 (54.9%)	119 (53.1%)	35 (38.9%)	35 (35.8%)	N/A	N/A
'I feel optimistic/hopeful about my future'						
Yes	82 (72.6%)	138 (61.6%)	54 (60.0%)	69 (70.4%)	343 (65.3%)	5594 (78.6%)

†Comparison population is comprised of a sub-sample of 7,188 adolescents ages 9-15 who responded to the ABC Behind the News Kids Talk survey in 2019. Comparison data were responses to question 'Your own future – do you feel hopeful?' (yes, no, unsure) while present survey data is from responses to question 'I feel optimistic about my future' (almost never, sometimes, often, very often, almost always). The proportion of 'often' 'very often' and 'almost always' answers in present survey data were compared to the proportion of 'yes' answers in comparative data.

School Connectedness

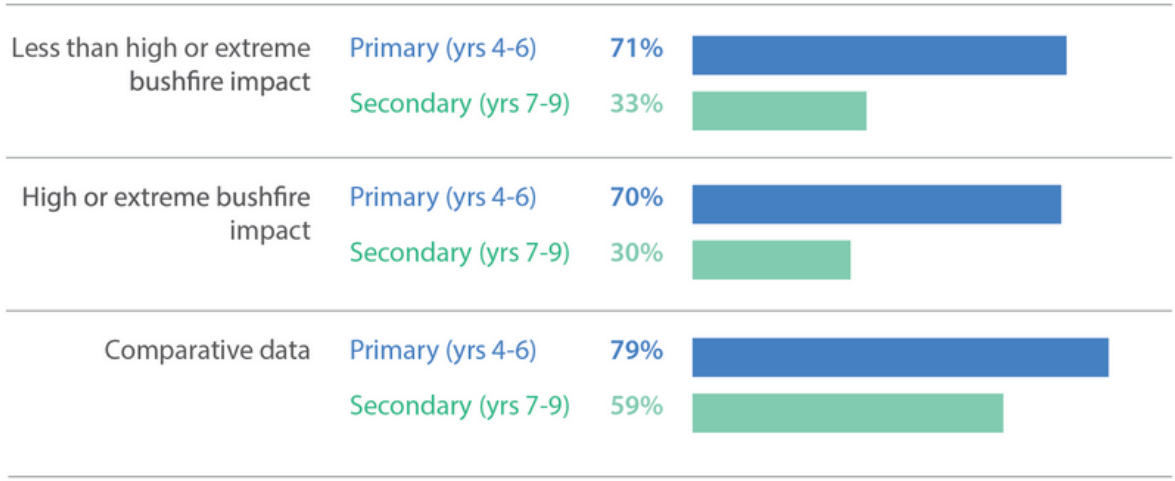
School connectedness was assessed through five survey questions taken from the Attitudes to School Survey ('I like this school', 'I am happy to be at this school', 'I feel like I belong at this school', 'I look forward to going to school', 'I feel proud about being a student at this school'). School connectedness as a factor was calculated with the proportions of all 'agree' or 'strongly agree' responses to each of the above questions.

Figure 1 presents the proportions of primary and secondary students who agreed or strongly agreed to questions indicating they felt connected to their school, by bushfire impact, and in comparison to 2020 data across all Victorian schools. There were no differences in the proportions of primary students who felt connected to their school by

bushfire impact (71% in less than high or extreme impact schools, and 70% in high or extreme impact schools), or for secondary students (33% in less than high or extreme impact schools, and 30% in high or extreme impact schools).

While there were no apparent differences by bushfire impact, there were large differences between school connectedness in the current sample versus wider comparative data. Compared to wider Victorian data (all government schools) from 2020, the current sample had substantially lower levels of school connectedness. Comparative data suggests that 79% of all primary students in years 4-6 felt connected to their school in 2020, however the current sample was lower by roughly 7-8% (compare 79% general population of years 4-6 to 70% in high or extreme bushfire impact schools, and 71% in less than high or extreme schools). This difference was larger for secondary students, where comparative data suggests that 59% of all secondary students in years 7-9 felt connected to their school in 2020, however the proportion in the current sample was lower by roughly 26-29% (compare 59% general population to 30% in high or extreme impact schools, and 33% in less than high or extreme impact schools).

Figure 1. Proportion of students that 'agreed' or 'strongly agreed' to questions indicating they felt connected to their school, in comparison to 2020 results across all Victorian government schools



**Comparative data on school connectedness is from the Attitudes to School Survey results from all Victorian government schools in 2020 (State of Victoria Department of Education and Training, 2021; Holland, 2021).*

4.3 Risk and protective factors for wellbeing among students

Potential risk and protective factors for wellbeing were assessed including demographic variables of gender, disability status and school-level bushfire exposure. Wider characteristics that could potentially influence wellbeing were assessed through a series of questions in the survey about feeling safe with family ('Do you feel safe when you are

with your family?'), worry about bushfires ('How often do you worry about bushfires?'), and worry about climate change ('How often do you worry about climate change?'). Responses were all scored on a yes/no scale.

Table 20 presents overall mean EPOCH wellbeing scores by risk and protective factors. School level bushfire exposure was not associated with mean wellbeing scores. There were no significant differences in mean wellbeing scores for girls and boys, however students who identified as non-binary or 'other' had significantly lower mean EPOCH scores (-0.59, 95% CI -1.04, -0.13. compared to girls). Living with a disability was also associated with significantly lower mean wellbeing scores compared to students without a disability (-0.71, 95% CI -0.94 to -0.48).

Students who reported they felt safe with their families had higher mean wellbeing scores, compared to students who responded with 'no or sometimes', with a large effect size that was statistically significant. Worry about bushfires and worry about climate change were not significantly associated with mean wellbeing scores in this sample.

Table 20. Mean overall wellbeing by risk and protective factors

	Mean total EPOCH score (SD)	Effect size (Hedge's g) (95% CI)
Gender		
Girl (234)	3.33 (0.79)	-
Boy (242)	3.44 (0.73)	0.14 (-0.03, 0.33)
Other (21)	2.85 (0.94)	-0.59 (-1.04, -0.14)*
Lives with a disability?		
No (358)	3.49 (0.73)	-
Yes (96)	2.95 (0.82)	-0.71 (-0.94, -0.48)***
School-level bushfire exposure		
Less than high or extreme impact (196)	3.29 (0.76)	-
High or extreme impact (303)	3.41 (0.79)	0.16 (-0.02, 0.34)
Feeling safe with family		
No or sometimes (67)	2.76 (0.88)	-
Yes (425)	3.46 (0.72)	0.94 (0.68, 1.20)***
Worry about bushfires		
Not worried (409)	3.38 (0.77)	-
Worried (84)	3.29 (0.78)	-0.11 (-0.34, 0.13)
Worry about climate change		
Not worried (446)	3.37 (0.77)	-
Worried (46)	3.26 (0.77)	-0.15 (-0.45, 0.16)

* P-value: 0.034
** P-value: 0.033
*** P-value <0.01

4.4 Student-identified support needs in bushfire-affected schools

The final section of the student survey asked directly about the types of support students think schools need after a bushfire ('What types of support do you think schools need to have available for students after bushfires?'), with the option to tick multiple response options and to provide free text suggestions.

Figure 2 presents the frequency of ideas for school support needs by primary students, and Figure 3 presents the same by secondary students. For both primary and secondary students, the most frequent option selected was to have schools provide 'someone to talk to about things that are worrying you' (selected by 64.1% of primary students, and 59.0% of secondary students).

For primary students, the second and third most frequently selected support options were that schools should provide 'fun things to do in after-school programs' (61.1%) and 'class activities that help express how you feel (e.g. art, music, drama, writing, class discussions)' (55.8%) (Figure 2). For secondary students, the second and third most frequently suggested ideas for support were that schools should provide 'Advice on what courses or jobs you could do when you finish school' (56.9%) and 'Help for your family to pay for school things' (56.4%) (Figure 3).

There were 4.7% of primary students and 8.5% of secondary students who selected 'Other' and provided free-text responses. Among primary students, free-text responses included suggestions such as 'Help being happy', 'Quiet place [yo]u can go to when [yo]ur nervous and to let our all [yo]ur feelings', and 'Doing things everyone likes to take their mind off their feelings'.

Among secondary students, free-text responses included suggestions such as 'Someone to talk to like a trusted person [who] takes our feelings properly like a professional', 'Getting professional people in to talk about how they got where they are', and 'Less strict policies for people who are struggling, like free dress with permission because they can't afford school uniform or help paying for the above'. There were also a handful of students who selected 'other' and wrote 'I do not know' or 'none' in the free-text box.

Figure 2. Types of support students think schools need after bushfires (Primary students)

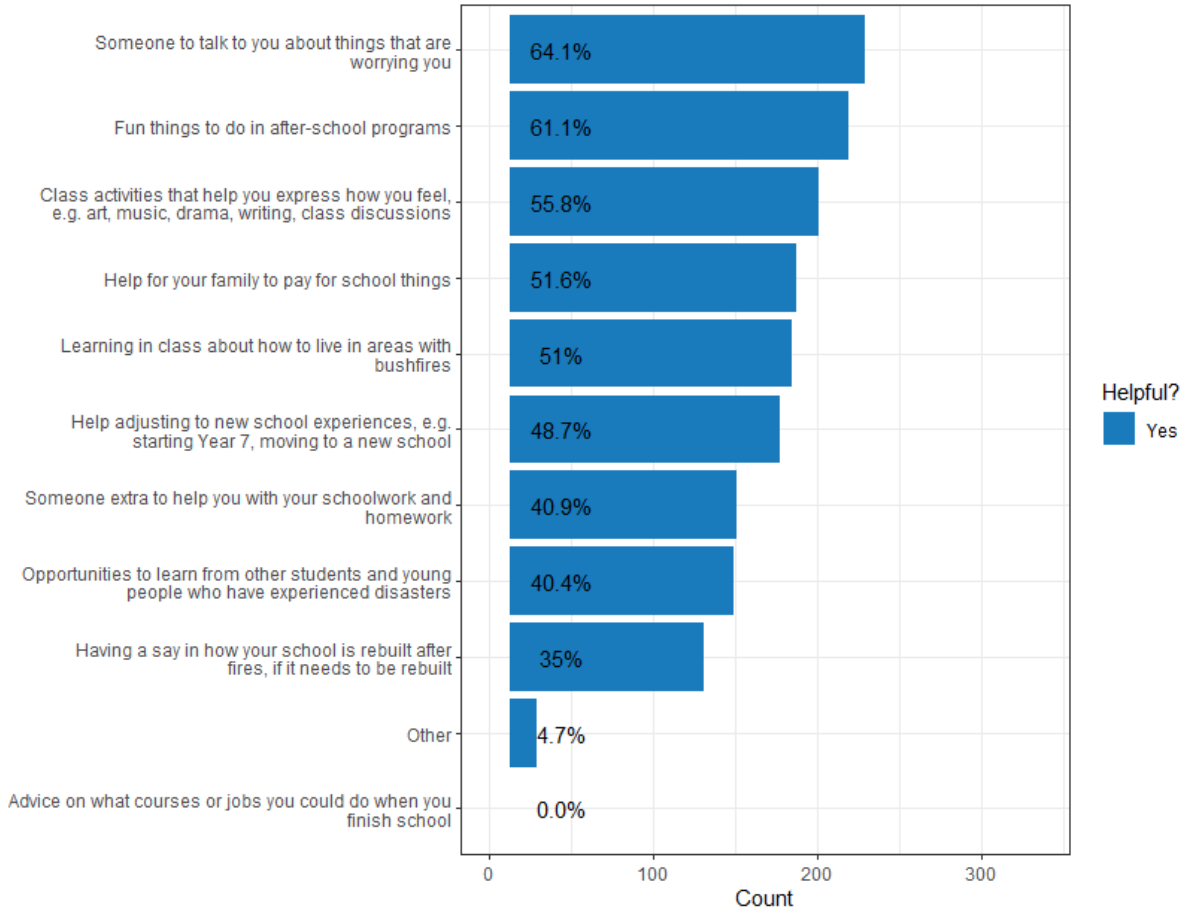
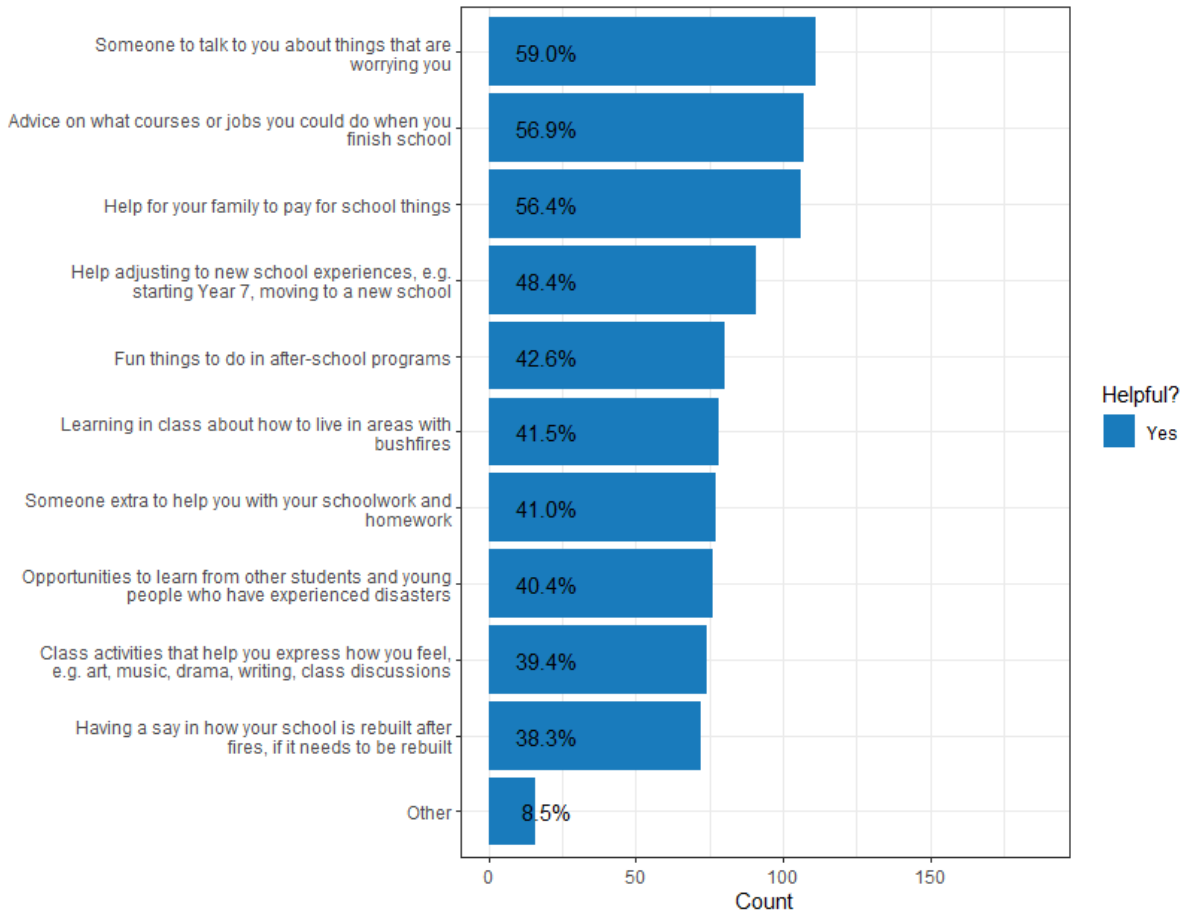


Figure 3. Types of support students think schools need after bushfires (Secondary students)



Discussion

This study surveyed staff and students in schools across Victoria affected by the 2019-20 Black Summer Bushfires. There were 525 students and 125 staff from 10 schools who participated in this research, and the survey results highlight key wellbeing and support needs across levels of bushfire impact. The sections below present an overview summary of staff findings, student findings, and wider implications considering staff and student findings together.

Staff

This study finds that there were no significant differences in overall wellbeing levels between staff in schools with high bushfire impact, when compared to those in schools with low bushfire impact. There were also no discernible differences in staff wellbeing scores for bushfire impacted schools compared to population norms, except for a slightly elevated score for the Relationships and Meaning subscale. This may indicate some positive growth in relation to sense of purpose and relationships, which aligns with previous disaster recovery studies that have also reported posttraumatic growth among those who were highly impacted (Pooley et al., 2012; Harms et al. 2018). However, the overall sample across levels of bushfire impact had significantly higher mean psychological distress when compared to general Australian population norms (mean K6 score of 12.47, compared to 8.7), with a large effect size, indicating an important difference. This demonstrates that while mental health and wellbeing are often closely related, they may have different trajectories in the aftermath of disaster, and likely benefit from different types and levels of support as the post-disaster recovery period unfolds.

The analyses show similar psychosocial risk profiles across both bushfire impact groups (low, high), and no significant differences in workplace psychosocial condition scores, burnout, or rates of bullying. However, it is important to highlight that there were certain risk indicators that were high for the entire sample. Most notably, there were more than 25% of all staff (1 in 4) that reported workplace bullying, while 17% reported threats of violence in the workplace (around 1 in 6). Outside of the school environment, there were around 14% (around 1 in 7) of all staff that reported having been frightened of their partner or ex-partner. These are serious public health issues that were reported at concerning levels for the entire sample, and are likely to have direct physical and mental health consequences for school staff, as well as direct and indirect impacts on schools and students (for example, via increased rates of staff turnover and absenteeism owing to mental health problems).

Similarly, the study found no statistically significant differences in rates of absenteeism or presentism between low and high bushfire impact groups, but a high overall rate of presentism (coming to work despite being ill or injured) for the total sample. These school staff reported coming to work despite being ill or injured (including with mental health problems) an average of 7.55 days in the last three months. This may indicate that staff use work as a way of managing their distress associated with bushfire impacts or as a way of avoiding or confronting their feelings associated with the bushfires. Alternatively, it may reflect a heightened sense of duty and responsibility towards the school and their

students and a preference for sacrificing their own self-care in order to be there for those that need them. This is something that was evident in following the 2009 bushfires where teachers and principals reported ignoring their own wellbeing in order to be there for their students and colleagues (Gibbs et al, 2019). Recent studies using comparable measures of absenteeism and presenteeism have indicated that sickness presenteeism, in particular, is associated with reduced work performance, organisational commitment, and psychological wellbeing, and these effects may persist over time and signal negative consequences for both individuals and employers (Collins et al., 2018).

Personal experiences both during and after the bushfires, which were directly related to the disaster (e.g., losing property, making insurance claims, living in temporary accommodation), were not found to be significantly associated with PERMA wellbeing scores. Rather, there were a series of other experiences that were associated with reduced wellbeing, including reports of changes in accommodation, health, and relationships (although not changes in income and employment), as well as family-related and work-related stress due to COVID-19 (although not financial stress or economic impacts on the community). This nuanced pattern of associations, including the lack of links involving wellbeing and measures of change in income or financial stress, may be due in part to the focus on an employee group (school staff) that did not report high job instability during the COVID-19 pandemic, as well as the high levels of government financial support provided during periods of lockdown in Victoria. However, the findings also draw attention to the multiple and unprecedented co-occurring stressors, including health, work and family-related stressors, that characterised the years following the 2019/20 Black Summer bushfires. They suggest that these experiences have all likely had critical impacts on wellbeing that have obscured the typical gradient in mental health and wellbeing outcomes based on levels of bushfire impact that are typically observed in post-disaster recovery contexts.

Finally, the staff survey findings also suggest similar patterns of help-seeking behaviours between low and high bushfire impact groups. That is, the most common strategies for both bushfire impact groups were to ask for support from family or friends, increase physical activity, ask for support from co-workers or supervisors, or to use the internet to obtain further information. These may all be viewed as 'informal' means of help-seeking. However, there were also sizable numbers of school staff that reported seeking help from formal services, such as GPs, mental health providers, and EAPs, and such services may also have important roles to consider in delivering support to school staff. In contrast, the surveys indicated few respondents (<10%) that reported using national or regional telephone helplines. On the one hand, this may suggest that such helplines are a less readily acceptable platform for accessing help, and may be a poorly targeted means of delivering support to school staff. However, an alternative perspective is that from such a low baseline, there may be important opportunities to increase provision of support via helplines, assuming that major barriers to accessing such services can be identified and overcome.

Students

The findings of this survey suggest that there were no discernible differences in overall wellbeing scores between students in the high or extreme bushfire impact group, versus those in the less than high or extreme impact group. In part, this may reflect the efforts of government, recovery agencies, and school leaders to provide appropriate support to

students in high impact schools. However, it is important to recognise that the overall sample (all bushfire impact levels) had significantly lower overall wellbeing scores when compared to general population norms. This may suggest that the absence of differences according to bushfire impact level are also due to the impacts of the COVID-19 pandemic on both groups.

Notwithstanding the absence of significant differences between lower and high impact schools, the findings highlight a particular cause for concern about the wellbeing of secondary students in all bushfire affected regions. That is, secondary students (years 7-9) had notably lower scores than primary school students (years 4-6) in terms of the overall EPOCH wellbeing measure, and across domains of engagement, optimism, connectedness and happiness, when considered across all bushfire impact levels. Given that wider research suggests that EPOCH scores are not correlated with age (Kern et al., 2016), this is an unexpected finding and suggests that secondary students may be particularly vulnerable to wellbeing impacts due to the bushfires and COVID-19 pandemic.

In addition to lower EPOCH scores, there were fewer secondary students reporting that they felt they were 'doing well' (37.3%) compared to primary students (54%) in this sample. Similarly, only a small proportion of secondary students felt connected to their school (31.5%), which was far lower than 2020 data on general population norms in secondary students in these year levels across all Victorian schools (59%). Importantly, this pattern of findings was not discernibly different between students in schools with different levels of bushfire impact. Accordingly, these findings highlight a critical need for further attention to the wellbeing of secondary students in all bushfire affected regions, and regardless of impact level. These findings may reflect unique difficulties that younger secondary students can have feeling connected to their school when most of their early years at secondary school have been experienced through remote learning due to pandemic restrictions. The transition to secondary school is already a challenge for a substantial minority of students without the overlay of a disaster experience (Victorian Auditor General's Office, 2015).

Other groups identified in this sample as more likely to have lower overall wellbeing scores included students who identified as non-binary or other genders, students living with disabilities, and students who feel unsafe with their families. Across all bushfire impact levels, these groups of students had significantly lower wellbeing levels and may also be in need of further targeted support.

Finally, the results of the student survey present student-identified ideas on what types of support schools should provide students after a bushfire. The most frequent response, from both primary and secondary students, was that schools should provide 'someone to talk to about things that are worrying you' (64.1% of primary students, and 59.0% of secondary students).

Strengths and limitations of this research

There are limitations to this research. Data collection was limited by wider contextual factors, including the multiple shifts between lockdowns and in-person learning due to the COVID-19 pandemic. Survey rollout was delayed significantly due to the time required to acquire DET ethics (RISEC) approval, and ultimately occurred at the end of a lockdown in October 2021 when schools were transitioning back to in-person learning. These factors likely made it more difficult for schools to participate and contributed to

the low response rate. While these challenges are likely to have made it more difficult for those schools highly affected by the bushfires, it is also possible that schools concerned about challenges being experienced within their school community may have been more likely to participate. In the context of major barriers to school engagement and recruitment, there was a small sample size for the staff survey, in particular, and this suggests that findings should also be viewed in relation to low statistical power (such that only large absolute differences between groups would likely have been detected).

There are limitations to the comparative data employed in this research. Firstly, all of the comparative data was collected in previous years and is not likely to reflect current population norms, given the widespread impacts of the pandemic. Even the comparative Attitudes to School Survey data from 2020 was collected early in the year and may not reflect the fatigue that can emerge as the year progresses. Typically, when research is conducted in rural or remote regions, comparative data on general population norms should be drawn from other rural or remote areas to account for any underlying urban/rural differences. However, there were limited sources of comparative data that could be drawn on from other schools that were located in remote or regional areas, as the present survey focused only on bushfire-affected regions. For this reason, certain comparisons were drawn to wider populations (i.e. school connectedness responses compared to findings from all government schools in Victoria), however further monitoring is needed to untangle what role urban/rural differences may play in differences observed here. Further research would also be beneficial to understand any differences between schools experiencing both bushfires and disruption from the COVID-19 pandemic, compared to those only experiencing the pandemic.

At present, due to limitations in the sample size and sample frame, these results should not be considered widely generalisable. However, this research presents a valuable preliminary indication of wellbeing and distress levels in schools across bushfire-affected regions, which indicates a strong need for further action.

Overall Implications

This research identified no significant differences in overall wellbeing or distress levels between high/extreme and lower impact groups, for either staff or students. This contrasts with prior research on mental health, wellbeing and learning after disasters, which usually finds a gradient, such that those facing higher levels of disaster exposure tend to be at highest risk of adverse outcomes, and this differentiation becomes more pronounced over time (as seen after the Black Saturday bushfires in 2009) (Bryant et al., 2020; Gibbs et al., 2020). However, the lack of gradient in staff and student results suggests that something different is happening for this sample. It is possible that high impact school communities have been given effective support post-disaster that has minimised the most immediate mental health and wellbeing impacts. However, the apparent differences between the current sample and population norms for the whole sample also indicates that *any level* of bushfire impact, when combined with the COVID-19 pandemic, introduces serious risks to mental health and wellbeing.

The current survey data alone cannot fully explain the reasons behind the aforementioned results, or demonstrate the degree to which the pandemic and bushfires have each influenced wellbeing and distress outcomes. Rather, it should be noted that this research drew on a limited sampling frame in which all participating schools were located in bushfire affected regions, which restricts the comparisons that

can be made. There were additional limitations in data collection processes, common to studies undertaken in disaster settings, which also affected the sample size. Nonetheless, the results of this research have presented critical early insights into the wellbeing and distress trends among staff and students, and suggest multiple ways to provide continued support to school communities, including both staff and students.

First, the results of this study suggest ***a need for further population health monitoring across school communities***. The present results demonstrate the value of this activity, through highlighting whole-of-population trends in wellbeing and distress. Post disaster mental health and wellbeing recovery trajectories vary for adults and children (Bryant et al., 2020; Masten & Narayan, 2012), and it is unclear how such trajectories in Victorian school communities will unfold with the COVID-19 pandemic ongoing. Further data collection, including non-bushfire affected schools in wider rural areas for improved analytical comparisons, would be highly beneficial to untangle the effects of pandemic and the bushfires on wellbeing. The most direct way to do this may be to add targeted wellbeing questions to routine surveys that go to all staff and students across Victorian schools (e.g., the Attitudes to School Survey, Staff Survey), which would allow for wider participation from comparison populations that have experienced the COVID-19 pandemic, but not the bushfires. Further monitoring will allow for critical information of wellbeing trajectories to be obtained, and acted on, and help build support for school communities that have faced unprecedented challenges due to the Black Summer bushfires and COVID-19 pandemic.

In addition to highlighting a need for further research, the findings also present implications for practice. Namely, the present results suggest ***a widespread need for continued psychosocial support for staff and students across all schools in bushfire affected regions***.

For staff, there are at least three pathways of support that are recommended based on the findings of this project, and in light of prior research:

- First, existing evidence suggests that the wellbeing of teachers and other school staff may be neglected when they prioritize student and family wellbeing over their own wellbeing (Gibbs et al., 2019). High levels of distress documented in the present survey results suggest a need for further support delivered to all school staff in bushfire affected regions, regardless of whether schools have had high or low levels of impact. A recent review of evidence identified 16 post-disaster teacher recovery support programs in Australia (Gibbs et al., 2021), and programs such as the SOLAR (Skills for Life Adjustment and Resilience) Program (O'Donnell et al., 2020) may be beneficial in schools across bushfire affected regions. The findings of this survey suggest there is a need for greater mental health support for school staff, and potentially a need for emotional preparedness and resilience programs before any further disasters take place.

- Second, given that the staff survey found that one of the most common patterns of help seeking behaviour was for school staff to approach co-workers or supervisors for support, it may be beneficial to support staff to feel equipped for this type of peer-to-peer support. For example, 'accidental counsellor' training, Psychological First Aid or mental health first aid resources (for example, see Lifeline Accidental Counsellor / Peer Support Training program (Lifeline, undated)) may be helpful to roll out for staff in schools across bushfire affected regions.

- Third, existing research suggests that school staff may face uncertainty about how to provide appropriate support to students in post-disaster environments, while also facing the impacts of trauma in their own lives (Alisic, 2012; Casserly, 2006). Further support to school staff focused on how to identify (e.g., via so-called 'case finding' strategies) and provide appropriate first-line responses to students may be beneficial in this setting, such as the 'Be You' Program by Beyond Blue (Be You, undated), which recently received a Resilient Australia Award in 2021, or the Emerging Minds Educators Community Trauma Workshop (Emerging Minds, 2019).

For **students**, there are two pathways of support that are most immediately recommended based on the findings of this research and in light of prior research:

- First, the finding of low wellbeing scores suggests a need for targeted psychosocial support for students in schools across all bushfire affected regions. DET has provided resources for schools to use following the Black Summer Bushfires (DET, undated), however additional support programs are likely to be needed given the findings of this survey. A recent research review of psychosocial support programs for schools after disasters identified existing programs which had positive impacts (Gibbs et al., in press). For example, programs such as SOLAR for children and adolescents may be helpful to roll out in schools across regions affected by bushfires.

- Importantly, in this survey, a large proportion of primary and secondary students clearly indicated that they think schools should provide 'someone to talk to about things that are worrying you'. We would strongly advise that this suggestion is taken seriously and actioned, as a direct request from students. It is notable that not all Victorian schools have counsellors, and it is unclear how many schools in bushfire-affected regions have this type of support presently. From the findings of this research, we would recommend that DET makes direct effort to logistically support schools to bring in trauma trained professionals (e.g., counsellors) who can directly support students, through long-term presence, providing space and time to talk through anything worrying them.

- While all schools and year levels are likely to benefit from the above lines of support, we note that secondary students (years 7-9) should be considered as a priority group for further support and monitoring given the results of this survey. Students living with a disability and students who identified as non-binary or other gender categories, and students who feel unsafe with their families, are also key groups to intentionally engage with in any wellbeing support programs as these groups also presented with significantly lower wellbeing levels across this sample.

Conclusion

Overall, this research finds significantly higher psychological distress among staff and lower overall wellbeing among students in bushfire-affected schools, compared to general population norms. Due to limitations in comparisons that can be made, the findings of this study should be seen as emerging rather than definitive. However, even as emerging findings, they underscore a need for continued support to schools across

bushfire-affected regions. Importantly, these findings suggest a need to provide psychosocial support to staff and students across all schools in bushfire affected regions, regardless of whether each school has had 'high' or 'low' impact levels. The above sections have presented focused recommendations via two pathways to support students and three pathways to support staff, in addition to further health monitoring across the education system.

Recommendations to DET

- Prioritise conducting further wellbeing and distress monitoring across school communities in Victoria, including non-bushfire-affected schools, to facilitate improved understanding of the impacts of the COVID-19 pandemic and Black Summer Bushfires on staff and students.

- Provide continued psychosocial support programs for staff in all schools across bushfire-affected areas, regardless of whether each school has had 'high' or 'low' impacts.

- Provide continued psychosocial support programs for students in all schools across bushfire-affected areas, regardless of whether each school has had 'high' or 'low' impacts.

- Provide logistical support for all schools in bushfire affected regions to hire and retain trauma-trained professionals who can directly support students (e.g. school counsellors), in order to action the student suggestion that after disasters schools should provide 'someone to talk to about things that are worrying' them.

- Provide additional training or resources for staff in schools across bushfire-affected regions, including on peer-to-peer support (e.g. 'accidental counsellor' training, Psychological First Aid), and resources to support staff on how to identify and provide appropriate first-line responses and referrals to students in need of support.

References

Alisic, E. (2012). "Teachers' Perspectives on Providing Support to Children After Trauma: A Qualitative Study." *School Psychology Quarterly* 27(1): 51-59.

ACT Government. (2021). Mental health. Accessed 5 July 2021. https://www.act.gov.au/wellbeing/explore-wellbeing-data/health/mental-health

Australian Disaster Resilience Institute (AIDR) (2018) Australian Disaster Resilience Knowledge Hub. Community Recovery Handbook. Accessed 5 July 2021. https://knowledge.aidr.org.au/resources/handbook-community-recovery/

Barrera-Valencia, M. C.-D., L., E. Trejos-Castillo and M. O'Boyle. (2017). Cognitive Profiles of Posttraumatic Stress Disorder and Depression in Children and Adolescents. *International Journal of Clinical and Health Psychology* 17(3): 242-250.

Beaglehole B, Mulder R, Frampton C, Boden J, Newton-Howes G, Bell C. (2018). Psychological distress and psychiatric disorder after natural disasters: systematic review and meta-analysis. *Br J Psychiatry* 213:716–722.

Peek L. (2008). Children and Disasters: Understanding Vulnerability, Developing Capacities, and Promoting Resilience - An Introduction. *Child Youth Environ* 18(1):1–29.

Be You (undated). Professional Learning [online]. Available at: https://beyou.edu.au/learn [Accessed 14 December, 2021]

Bonanno G., Brewin C., Kaniasty K, La Greca A. (2010). Weighing the Costs of Disaster: Consequences, Risks, and Resilience in Individuals, Families, and Communities. *Psychol Sci Public Interes* 11(1):1–49.

Brown, J. B., Lent, B., Brett, P. J., Sas, G., & Pederson, L. L. (1996). Development of the Woman Abuse Screening Tool for use in family practice. *FAMILY MEDICINE 28*: 422-428.

Bryant R, Gibbs L, Gallagher HC, Pattison P, Lusher D, MacDougall C, et al. (2020). The Dynamic Course of Psychological Outcomes Following the Victorian Black Saturday Bushfires Aust N Z J Psychiatry. doi: 10.1177/0004867420969815 [Epub ahead of print]. PMID: 33176436.

Burr, H., Berthelsen, H., Moncada, S., Nubling, M., Dupret, E., Demiral, Y., . . . Copsoq Network International. (2019). The third version of the Copenhagen Psychosocial Questionnaire. *Saf Health Work 10*(4), 482-503. doi:10.1016/j.shaw.2019.10.002

Butler, J., & Kern, M. L. (2016). The PERMA-Profiler: A brief multidimensional measure of flourishing. *Int J Wellbeing, 6*(3). doi:10.5502/ijw.v6i3.526

Casserly, M. (2006). Double jeopardy: public education in New Orleans before and after the storm. *There Is No Such Thing as a Natural Disaster; Race, Class and Hurricane Katrina.* C. Hartman and G. D. Squires. New York, Routledge**:** 197-214.

Collins AM, Cartwright S, Cowlishaw S. (2018). Sickness presenteeism and sickness absence over time: A UK employee perspective. *Work & Stress* 32, 68-83.

DET (undated). Mental health support for the 2019-2020 Victorian bushfires [online]. Available at: https://www.education.vic.gov.au/school/teachers/health/mentalhealth/Pages/

mental-health-support-for-the-victorian-bushfires-2020.aspx [Accessed 14 December 2021]

Emerging Minds (2019). Educators community trauma workshop [online]. Available at: https://emergingminds.com.au/resources/educators-community-trauma-workshop/ [Accessed 14 December, 2021]

Ferris, J. A., & Wynne, H. J. (2001). *The Canadian problem gambling index: Final report*. Retrieved from Ottawa, ON.

Fu C and Underwood C (2015). A meta-review of school-based disaster interventions for child and adolescent survivors. *Journal of Child and Adolescent Mental Health* 27:3.

Furukawa, T. A., Kessler, R. C., Slade, T., & Andrews, G. (2003). The performance of the K6 and K10 screening scales for psychological distress in the Australian National Survey of Mental Health and Well-Being. *Psychol Med 33*(2), 357-362. doi:10.1017/s0033291702006700

Gibbs, L., Waters, E., Bryant, R. A., Pattison, P., Lusher, D., Harms, L., . . . Forbes, D. (2013). Beyond Bushfires: Community, Resilience and Recovery - a longitudinal mixed method study of the medium to long term impacts of bushfires on mental health and social connectedness. *BMC Public Health* 13: 1036. doi:10.1186/1471-2458-13-1036

Gibbs L, Nursey J, Molyneaux R, Marinkovic K, Quinn P. (2019). Strengthening School Communities Final Report to Teachers Health Foundation: Building teacher and school capacity to cope with trauma impacts on children. Melbourne, Australia: Jack Brockhoff Child Health & Wellbeing Program, University of Melbourne; 2019.

Gibbs L, Nursey J, Carpenter L, Cowlishaw S, Roberts M, Cook J, Wraith R, Molyneaux R, Kosta L, Ireton G, Marinkovic K, Forbes D, Bryant R. (2020). Understanding of the long term impacts on children of bushfires. Final report to the Victorian Department of Education and Training. University of Melbourne, February 2020.

Gibbs L, Marinkovic K, Nursey J, Tong L. A, Tekin E, Ulubasoglu M, Callard N, Cowlishaw S, Cobham V. (in press). Child and adolescent psychosocial support programs following natural disasters – a scoping review of emerging evidence. *Current Psychiatry Reports* (in press).

Gibbs L, Cowlishaw S, Ulubasoglu M, Tekin E, Cesur R, Watterston J, Callard N, Cobham V, Leppold C, Marinkovic K, Molyneaux R, Baur J, Burns A, Meagher N, Kartal D, Tong L.A, Kwong E, Wraith R, Younger D, Newnham E, Cook J, Nursey J. (2021). School staff support after major emergencies. Draft Final Report to the Teachers Health Foundation. December 2021.

Goodyear-Smith, F., Coupe, N. M., Arroll, B., Elley, C. R., Sullivan, S., & McGill, A. T. (2008). Case finding of lifestyle and mental health disorders in primary care: Validation of the 'CHAT' tool. *Br J Gen Pract 58*(546), 26-31. doi:10.3399/bjgp08X263785

Harms L, Abotomey R, Rose D, Kron RW, Bolt B, Waycott J, et al. (2018). Postdisaster Posttraumatic Growth: Positive Transformations Following the Black Saturday Bushfires. *Australian Social Work* 71(4):417-29.

Holland M (2021). Personal communication on Dec 7, 2021.

Kern M.L., Benson L., Steinberg E.A., Steinberg L. (2016). The EPOCH measure of adolescent well-being. *Psychological Assessment* 28:586-597.

Lifeline (undated). Accidental Counsellor [online]. Available at: https://www.lifeline.org.au/get-involved/workplace-training/accidental-counsellor/ [Accessed 14 December, 2021]

Li-Sauerwine, S., Rebillot, K., Melamed, M., Addo, N., & Lin, M. (2020). A 2-question summative score correlates with the Maslach Burnout Inventory. *West J Emerg Med, 21*(3): 610-617. doi:10.5811/westjem.2020.2.45139

Maslach, C., Jackson, S. E., & Leiter, M. P. (2016). *Maslach Burnout Inventory Manual. 4th ed.* Menlo Park, CA: Mind Garden Inc.

Masten AS, Narayan AJ. (2012). Child Development in the Context of Disaster, War, and Terrorism: Pathways of Risk and Resilience. *Annual Review of Psychology* 63(1):227-57

McNeely, J., Cleland, C. M., Strauss, S. M., Palamar, J. J., Rotrosen, J., & Saitz, R. (2015). Validation of self-administered Single-Item Screening Questions (SISQs) for unhealthy alcohol and drug use in primary care patients. *J Gen Intern Med, 30*(12): 1757-1764. doi:10.1007/s11606-015-3391-6

Mutch, C. (2014). The role of schools in disaster preparedness, response and recovery: what can we learn from the literature? *Pastoral Care in Education* 32(1).

Mutch, C. (2015). The role of schools in disaster settings: Learning from the 2010-2011 New Zealand Earthquakes. *International Journal of Educational Developmen*t 41:283-291.

O'Donnell M, Lau W, Fredrickson J, Gibson K, Bryant R, Bisson J, Burke S, Busuttil W, Coghlan A, Creamer M, Gray D, Greenberg N, McDermott B, McFarlane AC, Monson C, Phelps A, Ruzek J, Schnurr P, Ugsang J, Watson P, Whitton S, Williams R, Cowlishaw S, Forbes D. (2020). An open label pilot study of a brief psychosocial intervention for disaster and trauma survivors. *Frontiers in Psychiatry* 11:483.

Parslow, R. A. and A. F. Jorm (2007). Pretrauma and posttrauma neurocognitive functioning and PTSD symptoms in a community sample of young adults. *American Journal of Psychiatry* 164(3): 509-515.

Pooley, J., Cohen, L., O'Connor, M., & Taylor, M. (2012). Posttraumatic stress and posttraumatic growth and their relation to self-efficacy in Northwest Australian cyclone communities. *Psychological Trauma Theory Research Practice and Policy*, 5. https://doi.org/10.1037/a0028046

Sacerdote, B. (2008). When the Saints Come Marching In: Effects of Hurricanes Katrina and Rita on Student Evacuees. NBER Working Paper No. 14385. http://papers.nber.org/papers/w14385. Accessed 21 September, 2017.

State of Victoria Department of Education and Training (2021). The Department of Education and Training Annual Report 2020-21. Melbourne, October 2021.

Turley, M. R. and J. E. Obrzut (2012). Neuropsychological Effects of Postraumatic Stress Disorder in Children and Adolescents. *Canadian Journal of School Psychology* 27(2): 166-182.

Victorian Auditor General's Office (2015). Education Transitions. Victorian Auditor-General's Report. March 2015.

Appendix 2: CONFIDENTIAL DRAFT PAPER - Student attendance in flood impacted areas of Queensland, Australia: Examining school-level differences before and after the disaster

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Abstract

Background: International evidence suggests that disaster exposure is associated with reduced student school attendance but the strength of evidence is limited.

Method: This study analysed attendance data from the Queensland Department of Education, collected from 173 state primary and 46 secondary schools in two urban areas of Queensland. Data was linked with flood impact data from the Queensland Reconstruction Authority and the suburb based Australian Bureau of Statistics 2011 Index of Relative Socio-economic Advantage and Disadvantage (IRSAD), to examine whether the 2011 floods impacted attendance rates for state schools in two council areas. Data were aggregated by gender and year level, and covered three time points (semester 1 of 2010, 2011, and 2012).

Results: Prior to the floods, attendance rates were significantly higher in primary compared to secondary schools. Primary schools with high flood impacted catchment areas had significantly higher attendance rates and were from higher socioeconomically advantaged suburbs, than low and medium flood impacted areas. For high flood impacted primary schools, attendance rates decreased from 2010 to the year of the floods (2011), before increasing again the following year. Conversely, secondary schools with low flood impacted catchment areas had significantly higher pre-flood attendance rates compared to high impacted areas. Amongst secondary schools with high flood impacted catchments, attendance rates increased from 2010 to 2011 demonstrating a different pattern than observed amongst primary schools.

Conclusions: This study indicates that there were temporary flood impacts on student attendance levels for primary and secondary schools, in addition to existing variations between schools and between primary and secondary levels. The patterns of impact were different for primary and secondary schools with primary schools showing reduced attendance in the year of the floods and secondary schools reporting increased attendance. Socioeconomic advantage and school level initiatives are likely influences on the extent and nature of disaster influences on student attendance, as well as potential student relocation to non-flood affected areas. Further research is needed to investigate student level variations in pre and post flood attendance, and impacts on school communities with high risk student populations. Inclusion of pre-disaster, socioeconomic and comparative data are important inclusions in studies of disaster impacts on student attendance.

Key words: school, student attendance, disaster, flood

Introduction

Experiencing a natural disaster can make it difficult for students to learn, not just because the hazard event may cause school closures or prevent access (Mudavanhu 2014, Dabrowski, Nietschke et al. 2020). Learning can be a continuing challenge because of individual trauma and mental health impacts, disruptions in class due to student distress and behavioural difficulties, and teacher uncertainty about how to provide appropriate post-trauma support to students (Casserly 2006, Sacerdote 2008, Alisic 2012, Alisic, Bus et al. 2012, Beaglehole, Mulder et al. 2018). Learning capacity will also be influenced by the family environment and the extent of post disaster disruption in the broader community (Vogel and Vernberg 1993, Norris, Friedman et al. 2002, La Greca 2013). Pre-existing social disadvantage can also be a risk factor for disaster impacts (Zahran, Peek et al. 2011, Howell and Elliott 2019, Thurber, Barrett et al. 2021). Evidence is emerging, although not always consistent, about disaster impacts on academic performance. Australian studies have shown reduced learning progression in reading and maths in the first few years after catastrophic bushfires that resulted in poorer academic performance compared to peers that was evident 3, 5 and 8 years post disaster (Gibbs, Nursey et al. 2019, Gibbs, Nursey et al. under review). While this is supported by other international evidence of disaster impacts on academic performance (Spencer, Polachek et al. 2016, Strøm, Schultz et al. 2016, Paudel and Ryu 2018), inconsistencies in findings indicate it may be influenced by a range of factors including type and severity of hazard, age group and time period examined, and the level of support available in the school environment (Casserly 2006, Sacerdote 2008, Barrett, Ausbrooks et al. 2012). Student wellbeing was demonstrated in a recent meta-analysis to be associated with academic achievement (Kaya and Erdem 2021). Wellbeing after disasters can be supported through psychosocial support programs, including school-based programs delivered by trained school staff or allied health professionals (Rolfsnes and Idsoe 2011, Fu and Underwood 2015, Gibbs, Marinkovic et al. 2021). Many of these programs aim to build and maintain student engagement with their schools but less is known about strategies to engage students who are not attending school, often due to significant physical or mental health issues (Gilmour, Hopkins et al. 2015) and they can become lost to the system (Watterston and O'Connell 2019). Attendance is known to be a factor influencing academic outcomes (Hancock, Shepherd et al. 2013, Australian Institute for Teaching and School Leadership 2019). Poor attendance is associated with socioeconomic disadvantage, parent education, indigenous status, and family mobility (Hancock, Shepherd et al. 2013).

There is limited evidence about whether disasters are associated with subsequent increases in absenteeism. A cross-sectional survey conducted in 2006-2007 of 1,505 randomly selected students aged 12-17 years across 17 districts in Sri Lanka showed that exposure to the 2004 tsunami was significantly associated with absenteeism (Siriwardhana, Pannala et al. 2013). Absenteeism was also shown to be associated with: posttraumatic stress and immigrant status in a cross-sectional study of 263 adolescents 18 months following the 1998 disco fire in Gothenburg, Sweden (Broberg, Dyregrov et al. 2005); loss of family income in a cross-sectional study of 96 rural students conducted 18 months after Hurricane Matthew in Haiti (Cook and Beachy 2018); and area-based slow economic recovery in Texas following Hurricane Ike in 2008 in a secondary analysis of school-level data for 464 schools from 2005-2011, (Lai, Esnard et al. 2019). A mixed method study of academic performance, absenteeism and school support amongst 64 students exposed to the the July 2011 massacre at Utøya summer camp in Norway showed that although absence from school increased and academic functioning

was temporarily reduced, students reported high satisfaction with school support (Frugård Strøm, Schultz et al. 2016). While these studies indicate the potential for disaster exposure to increase subsequent absenteeism, many of the studies have important limitations including lack of pre-disaster data, small sample sizes, and lack of comparative groups.

A Queensland case study analysis of strategies to improve student attendance identified school leader attitude and positive school culture as factors associated with improved attendance rates (Mills, Howell et al. 2017). A report of a school program designed to prevent school absenteeism following a flood in Western Virginia showed no increase in school absenteeism in the 7 months following the flood compared to attendance records for the previous ten years (Echterling 1989). However, very few details were provided about the intervention or implementation and no formal evaluation other than attendance records, with no comparative data. The paper reports that "although parents reported that they read and responded positively to the pamphlet [on emotional first-aid for children], there are no data to demonstrate that they actually carried out any of the pamphlet's recommendations" (p181). Therefore, it is not possible to determine if the positive outcomes were a result of the program or if there were simply no disaster impacts on attendance levels.

This paper reports on an analysis conducted of school-level attendance rates before and after major flooding in urban areas of Queensland Australia in January 2011 to identify any indication of disaster impacts on student absenteeism. The Queensland Floods 2010-11 forced the evacuation of thousands of people from towns and cities. There were 33 fatalities and 3 people still missing (Queensland Floods Commission of Inquiry 2012). They remain one of Australia's costliest flooding events, causing an estimated $6.7 billion in tangible damages, with an overall cost of $14.1 billion (Deloitte Access Economics 2016).

Method

Participants

This study analysed attendance data held by the Queensland Department of Education, collected from government primary and secondary schools in two urban areas of Queensland. For the purposes of analysis schools were categorized as primary or secondary school based on year level (prep to year 7[1], and year 8 to 12, respectively). Special education schools were excluded as year levels were not differentiated, and distance education schools were excluded as they did not have defined catchment areas. A total of 219 schools were included in this study, comprising 173 primary schools and 46 secondary schools, (inclusive of 5 schools with both primary and high students) – all of the government schools in the areas selected for study. Data included in this study covered the full student population at included schools and was aggregated by gender and year level, and covered three time points (semester 1 of 2010, 2011, and 2012).

Measures

[1] Prior to 2015 Year 7 was considered part of primary school in the Queensland education system.

Attendance

The proportion of attendance was calculated as the full-time equivalent days attended, divided by the total possible full-time equivalent attendance days, aggregated by gender and year level. Attendance rates were expressed as percentages for each of interpretation.

Flood impact

Flood impact categories for school catchments where informed by flood impact data from the Queensland Reconstruction Authority, who surveyed impacted houses following the 2011 Queensland floods. The Authority recorded damage to individual surveyed properties as either: no damage, minor, moderate, severe, or total damage. Damage scores for the number of properties at each damage level were weighted (minor, moderate*2, severe*3, total*4) and scores summed to create a total score ("total flood damage") for each catchment. The total flood damage score was then divided into the following groups: low (those with no recorded damage within the school catchment area; total flood damage scores or "0"), medium (those with total flood damage scores between 1 and the median score of 244), and high (those with total flood damage scores over the median score of 244). A total of 148 schools had catchment areas with low flood impact, 36 with medium impact, and 35 with high flood impact.

Socio-economic status

Information on socio-economic advantage and disadvantage was adapted from the Socio-Economic Indexes for Areas (SEIFA), an Australian Bureau of Statistics product informed by the Australian Census of Population and Housing. Data from the 2011 SEIFA Index of Relative Socio-economic Advantage and Disadvantage (IRSAD) was linked with the location (suburb) of each school to provide an indication of socio-economic status for the area. The IRSAD provides information on the collective socioeconomic advantage and disadvantage of residents in a particular area (Australian Bureau of Statistics 2016). Lower scores reflect greater relative disadvantage and lower advantage, while higher scores reflect relative greater advantage and lower disadvantage. Consistent with recommendations from the Australian Bureau of Statistics (Australian Bureau of Statistics 2011) index rankings rather than index scores were used for analysis and state based (rather than national) rankings were selected. State based percentiles were also used for descriptive purposes.

Data analysis

Data preparation and descriptive analyses were conducted in Stata SE version 16.0. Mean attendance rates were displayed in tables and plotted in graphs. Non-parametric tests were selected as data distributions violated parametric assumptions. Mann-Whitney U tests examined differences between primary and secondary schools, while Kruskal-Wallis H test and post-hoc tests were used to compare flood impact group differences in attendance rates at baseline (Semester 1 of 2010) and in IRSAD rankings. Friedman and Wilcoxon Sign Rank tests were used to assess for change over time in attendance rates amongst schools in high flood impacted catchments.

Results

The average rates of attendance over time and by impact level are displayed in Table 1 for the included Queensland state primary and secondary schools.

Table 1. Attendance rates by year and impact level for students in primary and secondary school

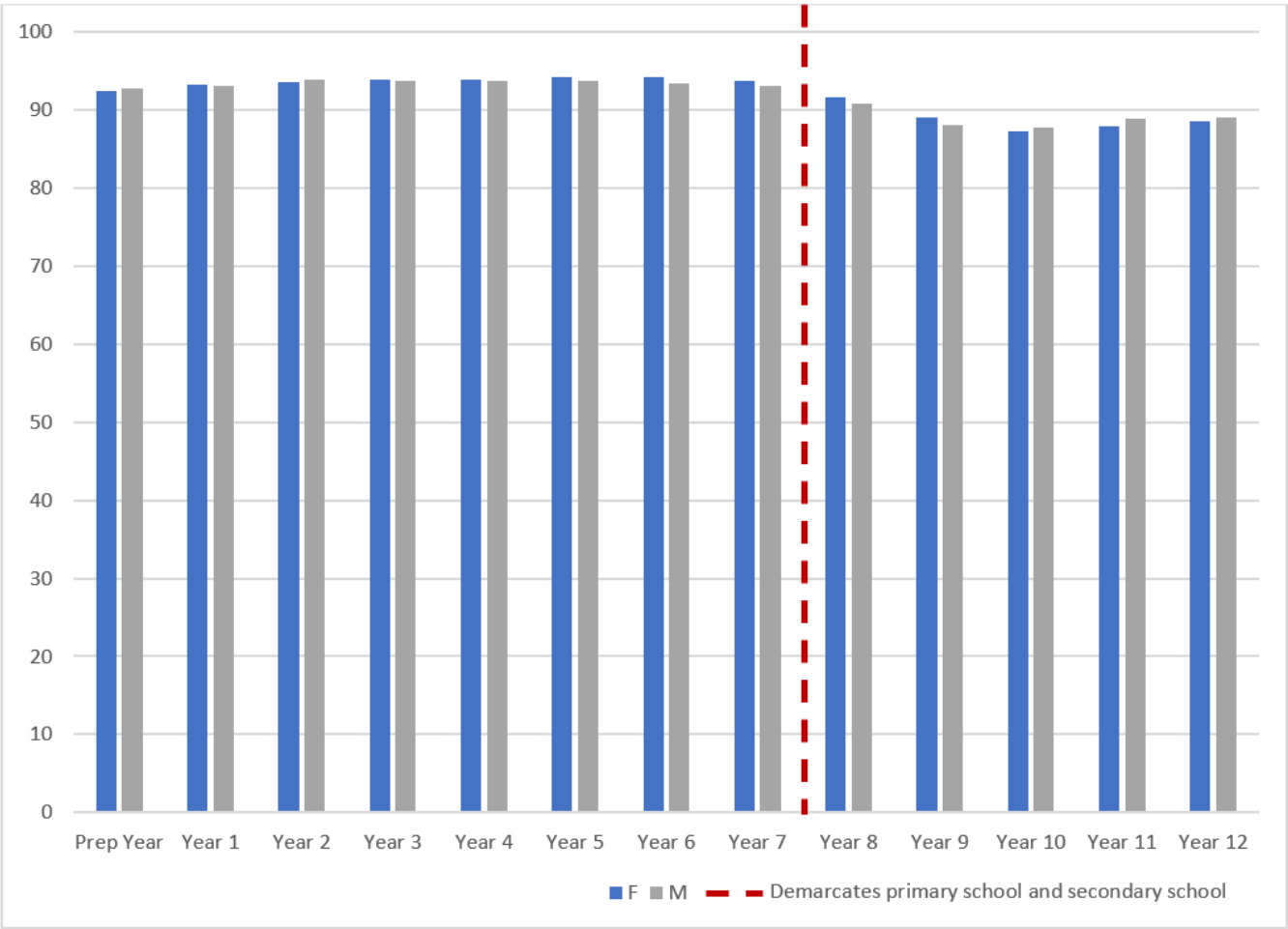
	2010			2011			2012		
	Low impact	Medium Impact	High Impact	Low impact	Medium Impact	High Impact	Low impact	Medium Impact	High Impact
	% (n)	*% (n)*	*% (n)*	*% (n)*	*% (n)*	*% (n)*	*% (n)*	*% (n)*	*% (n)*
Primary School	93.49% (114)	93.28% (35)	93.91% (20)	93.43% (113)	93.04% (35)	93.44% (20)	93.69% (113)	93.29% (35)	93.84% (20)
Secondary school	89.37% (29)	91.63% (1)	87.63% (15)	89.73% (30)	92.24% (1)	88.25% (15)	90.17% (30)	92.87% (1)	88.37% (15)

Note. Attendance rate is calculated by = (full time equivalent days absent)/(total possible full time equivalent attendance days) and expressed as a percentage. Data is aggregated at the level of gender within each year level at each school. *n* = reflects the number of schools in each cell.

Pre-flood differences

Attendance rates in semester 1 of 2010, a year before the 2011 floods for included state schools in the selected council areas of Queensland are displayed by gender and year level in Figure 1. Visual inspection of the graph indicated attendance rates appear to decrease across the secondary school years.

Figure 1. Attendance rates at baseline by year level and gender



A Mann-Whitney U test found a significant difference in attendance rates between primary schools and secondary schools prior to the floods, $z = 22.57$, $p < .0001$, corresponding to an 84% probability of a higher attendance rate occurring for a primary school observation (compared to a secondary school observation).

Based on identified differences between primary and secondary schools, subsequent analysis examined primary and secondary school attendance rates separately. For secondary school comparisons, the medium impact category was dropped due to only one school being included in that category. Visual inspection of a boxplot indicated that distributions of attendance rates were similar for all groups at baseline, medians were therefore compared using a Kruskal-Wallis H test and post-hoc pairwise comparisons using Dunn's procedure with a Bonferroni correction for multiple comparisons. Prior to the floods, primary school attendance rates were found to be significantly different between flood impact groups, $H(2) = 15.91$, $p = .0004$. Pairwise comparisons indicated that pre-flood attendance rates were significantly higher in primary schools with subsequent high flood impacted catchment areas (median = 94.35), compared to schools with low (93.89) or medium (93.79) impacted catchments ($p<.005$

and $p<.0002$, respectively). No pre-flood differences were found between primary school attendance rates in low and medium impacted areas ($p = .196$). Pre-flood attendance rates for secondary schools were found to be significantly higher in schools with low flood impacted catchment areas in the following years (89.50) compared to high impacted areas (88.37), $H(2) = 11.05$, $p = .001$. In summary, primary schools had the highest pre-flood attendance rates in schools with catchment areas highly impacted by the 2011 floods, while secondary schools had a different pattern with lower pre-flood attendance rates occurring within high flood impacted areas.

Socioeconomic advantage

Primary schools included in the study were located in suburbs with QLD IRSAD percentiles ranging from 2 to 100, with a mean of 69.40 and a median of 78. Secondary schools included in the study were located in suburbs with IRSAD percentiles ranging from 20 to 99, with a mean of 75.73 and a median of 82.

Distributions of 2011 IRSAD state rankings were dissimilar across impact groups at baseline, mean ranks (rather than median scores) were therefore compared using a Kruskal-Wallis H test and post-hoc tests to explore differences in SES across flood impact groups.

IRSAD ranks for primary schools' suburbs were statistically significantly different between impact groups, $H(2) = 27.30$, $p = .0001$, with pairwise comparisons indicating that high impacted areas had significantly higher socio-economic advantage (IRSAD rankings; mean rank = 1522.38) than low (1313.42) and medium (1246.11) impacted areas, $p<.0001$. No significant difference was found between low and medium impact groups ($p = .208$).

For secondary school comparisons, no significant differences were found between low (221.01) and high (202.43) impact groups in IRSAD ranks, $H(2) = 2.20$, $p = .138$. In summary, primary schools with catchment areas highly impacted by the 2011 floods had the highest socioeconomic advantage compared to low and medium impact schools (based on 2011 state-based IRSAD ranks), no differences were found between secondary schools.

Attendance over time

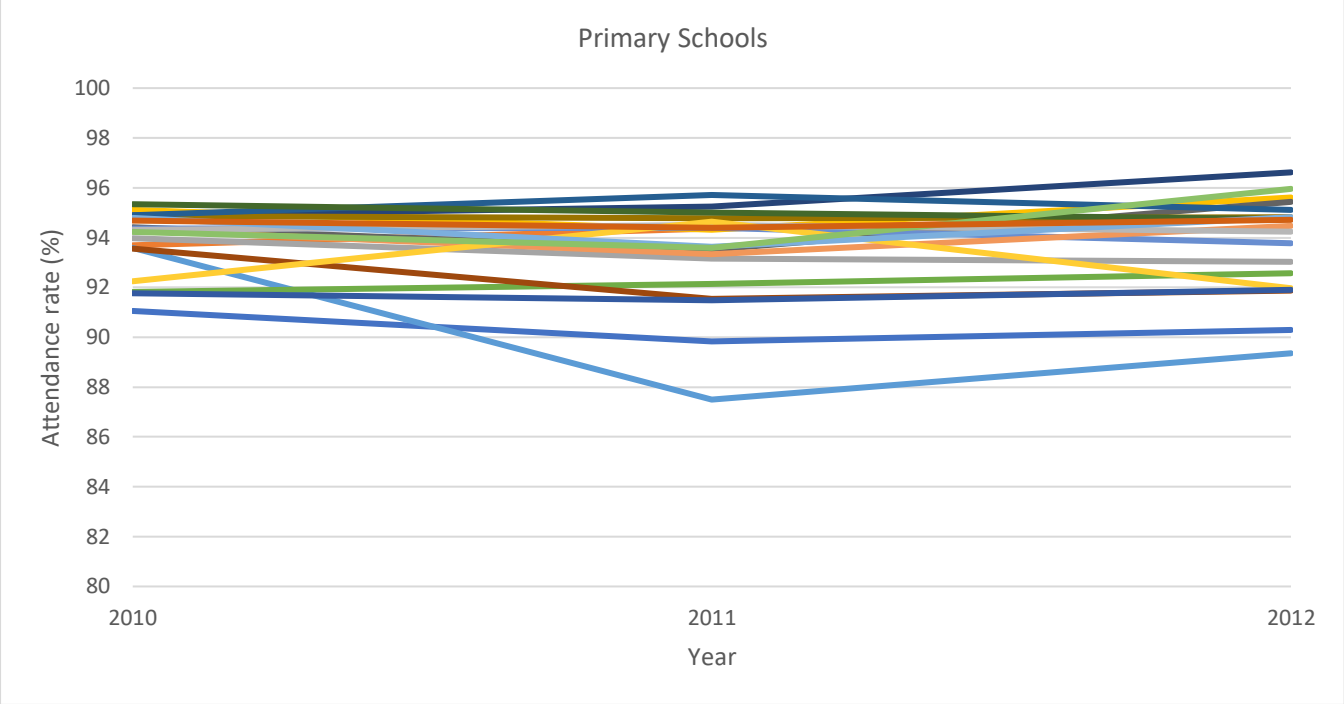
Attendance rates over time for each primary school and secondary school with a high level of flood impact within their respective catchment areas were plotted separately in Figure 2. Visual inspection of these plots suggests more variability between mean attendance at the secondary school level (compared to the primary schools). Change in attendance rates over time for high flood impacted schools was examined using Friedman test followed by pairwise comparisons using Wilcoxon Signed Rank test, separately for primary and secondary schools.

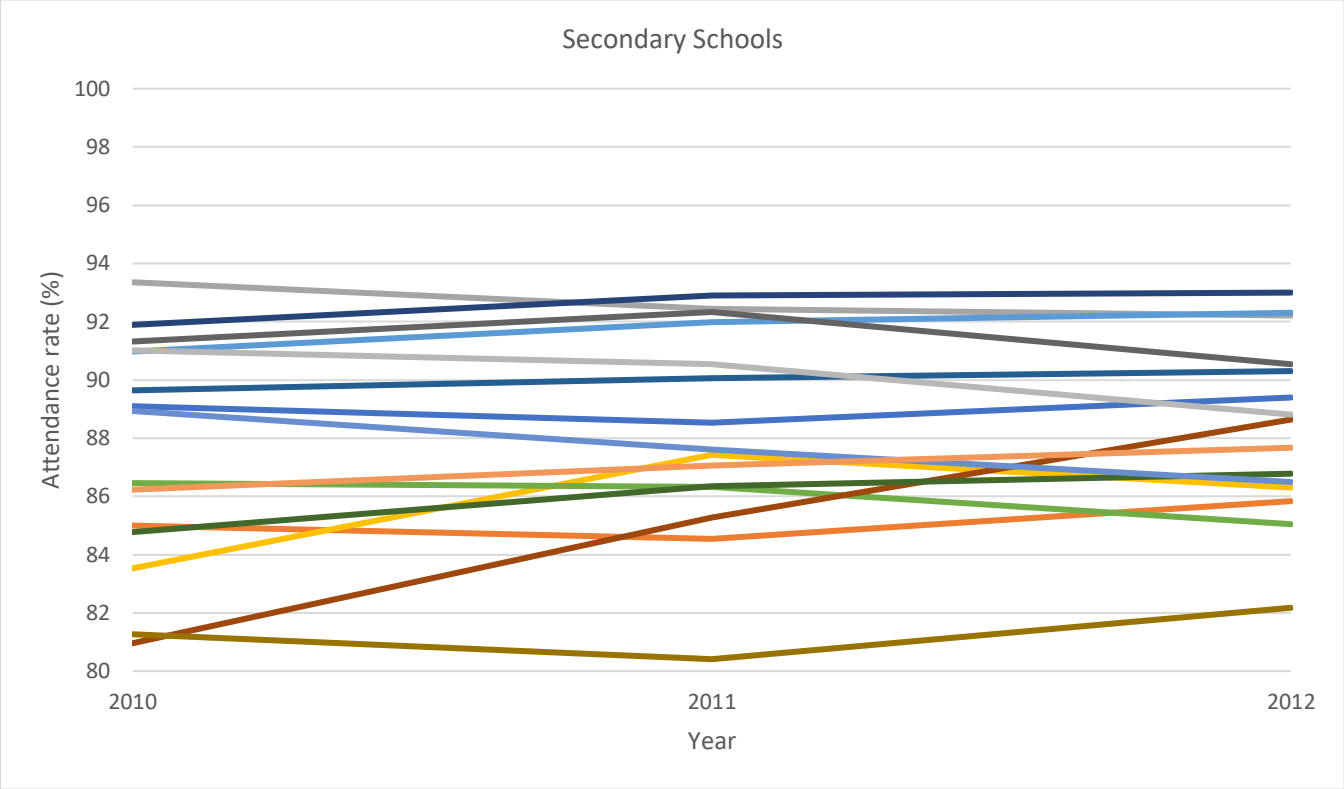
Attendance rates amongst high flood impacted primary schools were found to change over time, $Q(2) = 11.14$, $p = .0038$, with a statistically significant decrease in primary school attendance rates between 2010 (median = 94.35) and 2011 (94.07; $z = 2.63$, $p = .009$), followed by a significant increase between 2011 and 2012 following the floods (94.60; $z = -3.63$, $p = .0003$). These results suggest that for primary schools with high impacted catchments attendance rates decreased from baseline to the year of the floods, before increasing again the following year.

Attendance rates amongst high flood impacted secondary schools were also found to change over time, $Q(2) = 8.57$, $p = .0138$, with a significant increase in attendance rates

observed between 2010 (88.37) and 2011 (89.06; z = -2.96, *p* = .003), followed by a non-statistically significant decrease between 2011 and 2012 (88.49; z = -.21, *p* = .833). These results suggest that for secondary schools with high impacted catchments attendance rates increased from baseline to the year of the floods, demonstrating a different pattern than observed amongst primary schools.

Figure 2. Attendance rates over time for schools with high flood impact within their respective catchment areas





Discussion

This study examined patterns of attendance rates at schools in two Queensland urban areas before and after the 2011 floods. For the purposes of comparison, schools were categorised based on level of flood impact in the school catchment area, i.e. the residential areas for the school community. Attendance rates for high flood impacted primary school communities were lower in the year of the floods (Jan 2011) compared to the previous year, before increasing again the following year. In contrast, attendance rates for highly impacted secondary school communities increased in the year of the floods compared to the previous year, demonstrating a different pattern than observed amongst primary schools. This suggests that disaster impacts, particularly in relation to school attendance, may be different depending on stage of schooling. Differences in primary and secondary school level attendance rates were already evident pre-floods, specifically, attendance rates were significantly higher in primary compared to secondary schools. This is consistent with previous Australian evidence (Hancock, Shepherd et al. 2013, Australian Institute for Teaching and School Leadership 2019).

Socioeconomic disadvantage is an established risk factor for absenteeism (Hancock, Shepherd et al. 2013, Mills, Howell et al. 2017, Australian Institute for Teaching and School Leadership 2019, Watterston and O'Connell 2019). The findings for primary schools in this study showing an association between high levels of flood impact and reduced attendance is of particular note given the schools were located in areas ranked relatively highly in terms of

social advantage. It is likely these impacts would have been greater in areas of social disadvantage.

The social advantage may also have acted as a protective factor for the secondary schools and explain why attendance levels actually increased in the year after the floods. An economic study conducted by Ulubasoglu and colleagues demonstrated short term income gains experienced by middle and high income earners in areas affected by the 2011 Queensland floods, most likely through demonstrated boosts to economic activity in the retail and health sectors (Ulubasoglu and Beaini 2020). This may have mitigated the family and community-level hardships usually associated with the post-disaster environment. Area-based slow economic recovery was associated with lower secondary school attendance in Texas following Hurricane Ike in 2008 (Lai, Esnard et al. 2019). Attendance can be further impacted when students are needed to help families re-establish their income, as was demonstrated in a study of farming families in rural Haiti affected by Hurricane Matthew (Cook and Beachy 2018).

There was considerable variability in attendance levels across the secondary schools in this study and so both community and school-level factors were likely contributors as well. Previous studies have examined the interplay between school support and student post disaster mental health, wellbeing and academic outcomes, particularly in relation to the benefits of psychosocial support programs (Fu and Underwood 2015, Gibbs, Marinkovic et al. 2021). A (non-disaster related) study of Queensland schools that have improved student attendance identified promising strategies which included School Principal use of data to engage the whole school community in tracking against targets; less focus on negative aspects relating to the student, family and household; and positive learning environments, as common strategies (Mills, Howell et al. 2017).

The links between absenteeism and reduced academic achievement are well-established (Hancock, Shepherd et al. 2013, Zubrick 2014, Australian Institute for Teaching and School Leadership 2019), with lifetime costs in terms of impacts on higher education and employment opportunities. In a small study of academic performance, absenteeism and school support amongst students exposed to the July 2011 massacre at Utøya summer camp in Norway, it was shown that school absence increased and academic functioning was temporarily reduced in the following year (Frugård Strøm, Schultz et al. 2016). However, students reported high satisfaction with school support and for those who remained at school through to completion, their grades improved in the last year of high school. The authors note that, "The findings underscore the importance of keeping trauma-exposed students in school and providing support over time"(p1), although they also acknowledge that the study did not include those students who dropped out of school nor did it include a comparison group.

Limitations

The Queensland Department of Education attendance data typically excludes part-time, and distance education students, along with those who are no longer enrolled in school, this study also excluded special education schools. When schools are closed due to a weather event or state of emergency, the school closure days are not considered school days for the purpose of attendance records. Data on attendance was collected for only Semester 1 of the

respective year. Attendance and absenteeism data was aggregated by gender and year level which precluded analysis of potentially vulnerable individuals and groups. Individual data is needed to fully understand the potential impacts of disasters on student attendance. A previous national study has shown that individual students have similar attendance levels from year to year (Hancock, Shepherd et al. 2013). Their school attendance patterns ('attendance careers') in the early years of school can accurately predict future school attendance. Average attendance was correlated with the school Socio-Economic Index (SEI). Further, the students in lower SEI schools showed markedly worse outcomes when they had increased absenteeism than students at higher SEI schools. These findings show the negative impact of absenteeism on academic outcomes and the additional impact of socio-economic of the school community on the likelihood of absenteeism and subsequent academic achievement. The impact of double disadvantage, i.e. low socioeconomic status and disaster exposure, on absenteeism and academic achievement could not be established in the current study.

Conclusion

This study adds to the limited evidence about disaster impacts on student attendance. School level data showed a temporary reduction in school attendance in primary schools in areas impacted by the 2011 Queensland floods and a temporary increase in school attendance in secondary schools in urban flood impacted areas. Attendance levels pre and post disaster were lower in secondary schools. There were indications of area-based social advantage and school-level influences on outcomes. Further research is needed to clarify influences of disaster exposure on individual attendance trajectories in studies that include pre-disaster levels, socioeconomic status and comparative data to contribute further to understanding of risk and protective factors that can be leveraged to support student outcomes following disaster experiences.

References

Alisic, E. (2012). "Teachers' Perspectives on Providing Support to Children After Trauma: A Qualitative Study." School Psychology Quarterly **27**(1): 51-59.

Alisic, E., M. Bus, W. Dulack, L. Pennings and J. Splinter (2012). "Teachers' Experiences Supporting Children After Traumatic Exposure." Journal of Traumatic Stress **25**: 98-101.

Australian Bureau of Statistics (2011). Technical Paper: Socio-Economic Indexes for Areas (SEIFA). ABS Catalogue No. 2033.0.55.001.

Australian Bureau of Statistics (2016). "Technical Paper Socio-Economic Indexes for Areas (SEIFA)." **ABS Catalogue No. 2033.0.55.001**.

Australian Institute for Teaching and School Leadership (2019). Spotlight: Attendance matters. Melbourne, AITSL.

Barrett, E. J., C. Y. B. Ausbrooks and M. Martinez-Cosio (2012). "The Tempering Effect of Schools on Students Experiencing a Life-Changing Event Teenagers and the Hurricane Katrina Evacuation." Urban Education **47**(1): 7-31.

Beaglehole, B., R. T. Mulder, C. M. Frampton, J. M. Boden, G. Newton-Howes and C. J. Bell (2018). "Psychological distress and psychiatric disorder after natural disasters: systematic review and meta-analysis." The British Journal of Psychiatry **213**: 716–722. DOI: 710.1192/bjp.2018.1210.

Broberg, A. G., A. Dyregrov and L. Lilled (2005). "The Göteborg discotheque fire: posttraumatic stress, and school adjustment as reported by the primary victims 18 months later." Journal of Child Psychology and Psychiatry **46**(12): 1279-1286.

Casserly, M. (2006). Double jeopardy: public education in New Orleans before and after the storm. There Is No Such Thing as a Natural Disaster; Race, Class and Hurricane Katrina. C. Hartman and G. D. Squires. New York, Routledge**:** 197-214.

Cook, A. C. and D. Beachy (2018). "The Impact of Hurricane Matthew on School Attendance: An Analysis from Rural Haiti." International Journal of Environmental Research and Public Health **16**(55).

Dabrowski, A., Y. Nietschke, P. Taylor-Guy and A. Chase (2020). Mitigating the impacts of COVID-19: Lessons from Australia in remote education. Victoria, Australia, Australian Council for Educational Research. https://doi.org/10.37517/978-1-74286-618-5.

Deloitte Access Economics (2016). The economic cost of the social impact of natural disasters. Sydney, Australia, Australian Business Roundtable for Disaster Resilience and Safer Communities.

Echterling, L. G. (1989). "An Ark of Prevention: Preventing School Absenteeism After a Flood." Journal of Primary Prevention **9**(3): 177-184.

Frugård Strøm, I., J.-H. Schultz, T. Wentzel-Larsen and G. Dyb (2016). "School performance after experiencing trauma: a longitudinal study of school functioning in survivors of the Utøya shootings in 2011." European Journal of Psychotraumatology **7**: 31359.

Fu, C. and C. Underwood (2015). "A meta-review of school-based disaster interventions for child and adolescent survivors." Journal of Child & Adolescent Mental Health **27**(3): 161-171.

Gibbs, L., K. Marinkovic, J. Nursey, L. A. Tong, E. Tekin, M. Ulubasoglu, N. Callard, S. Cowlishaw and V. Cobham (2021). "Child and adolescent psychosocial support programs following natural disasters – a scoping review of emerging evidence." Current Psychiatry Reports **23**(82).

Gibbs, L., J. Nursey, L. Carpenter, S. Cowlishaw, M. Roberts, J. Cook, R. Wraith, R. Molyneaux, L. Kosta, K. Block, G. Ireton, K. Marinkovic, D. Forbes and R. Bryant (under review). "Post-disaster academic progress: long term impacts on secondary school students from bushfire exposure in Australia."
Gibbs, L., J. Nursey, J. Cook, G. Ireton, N. Alkemade, M. Roberts, H. C. Gallagher, R. Bryant, K. Block, R. Molyneaux and D. Forbes (2019). "Delayed disaster impacts on academic performance of primary school children." Child Development **90**(4): 1402–1412.
Gilmour, M., L. Hopkins, G. Meyers, C. Nell and N. Stafford (2015). School connection for seriously sick kids. Who are they, how do we know what works, and whose job is it? Canberra, Australia, Australian Research Alliance for Children and Youth.
Hancock, K. J., C. C. J. Shepherd, D. Lawrence and S. R. Zubrick (2013). Student attendance and educational outcomes: Every day counts. A report prepared for the Department of Education, Employment and Workplace Relations. Canberra, Telethon Institute for Child Health Research, Centre for Child Health Research, University of Western Australia.
Howell, J. and J. R. Elliott (2019). "Damages Done: The longitudinal impacts of natural hazards on wealth inequality in the United States." Social Problems **66**(3): 448–467.
Kaya, M. and C. Erdem (2021). "Students' Well-Being and Academic Achievement: A Meta-Analysis Study." Child Indicators Research **14**: 1743–1767. https://doi.org/1710.1007/s12187-12021-09821-12184.
La Greca, A. M., Lai, B. S., Llabre, M. M., Silverman, W. K., Vernberg, E. M., & Prinstein, M. J. (2013). "Children's Postdisaster Trajectories of PTS Symptoms: Predicting Chronic Distress." Child & Youth Care Forum **42**(4): 351-369.
Lai, B. S., A.-M. Esnard, C. Wyczalkowski, R. Savage and H. Shah (2019). "Trajectories of School Recovery After a Natural Disaster: Risk and Protective Factors." Risk, Hazards & Crisis in Public Policy **10**(1): 32-51.
Mills, M., A. Howell, M. Kubler, W. Tomaszewski, D. Lynch, L. Phillips, A. Carroll, J. Dungan, A. Hellens and K. Sheppard (2017). Making Every Day Count: Effective strategies to improve student attendance in Queensland state schools. Brisbane, School of Education and ISSR, The University of Queensland.
Mudavanhu, C. (2014). "The impact of flood disasters on child education in Muzarabani District, Zimbabwe." Jàmbá: Journal of Disaster Risk Studies **6**(1).
Norris, F. H., M. J. Friedman, P. Watson, C. M. Byrne, E. Diaz and K. Kaniasty (2002). "60 000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981-2001." Psychiatry: Interpersonal and biological processes **65**(3): 207-239.
Paudel, J. and H. Ryu (2018). "Natural disasters and human capital: The case of Nepal's earthquake." World Development **111**: 1-12.
Queensland Floods Commission of Inquiry (2012). Final Report. http://www.floodcommission.qld.gov.au/__data/assets/pdf_file/0007/11698/QFCI-Final-Report-March-2012.pdf.
Rolfsnes, E. S. and T. Idsoe (2011). "School-based intervention programs for PTSD symptoms: A review and meta-analysis." Journal of Traumatic Stress **24**: 155–165.
Sacerdote, B. (2008). When the Saints Come Marching In: Effects of Hurricanes Katrina and Rita on Student Evacuees. NBER Working Paper No. 14385. http://papers.nber.org/papers/w14385. Accessed 21 September, 2017.

Siriwardhana, C., G. Pannala, S. Siribaddana, A. Sumathipala and R. Stewart (2013). "Impact of exposure to conflict, tsunami and mental disorders on school absenteeism: findings from a national sample of Sri Lankan children aged 12–17 years." BMC Public Health **13**(560).
Spencer, N., S. Polachek and E. Strobl (2016). "How do hurricanes impact scholastic achievement? A Caribbean perspective." Natural Hazards **84**: 1437-1462.
Strøm, I. F., J. H. Schultz, T. Wentzel-Larsen and G. Dyb (2016). "School performance after experiencing trauma: a longitudinal study of school functioning in survivors of the Utøya shootings in 2011." European Journal of Psychotraumatology **7**(31359).
Thurber, K. A., E. M. Barrett, J. Agostino, C. Chamberlain, J. Ward, V. Wade, M. Belfrage, R. Maddox, D. Peiris, J. Walker, B. Baffour, M. Wenitong, C. Law, T. Senior, N. Priest, K. Freeman and T. Schramm (2021). "Risk of severe illness from COVID-19 among Aboriginal and Torres Strait Islander adults: the construct of 'vulnerable populations' obscures the root causes of health inequities " Aust NZ J Public Health. Online; doi: 10.1111/1753-6405.13172.
Ulubasoglu, M. and F. Beaini (2020). Disasters and Economic Resilience: the effects of the Queensland Floods 2010-11 on individual income: a case study on the Brisbane River catchment area. Melbourne, Australia, Bushfire and Natural Hazards CRC.
Vogel, J. M. and E. M. Vernberg (1993). "Part 1: Children's psychological responses to disasters." Journal of Clinical Child Psychology **22**(4): 464-484.
Watterston, J. and M. O'Connell (2019). Those who disappear: the Australian education problem nobody wants to talk about. Melbourne, Melbourne Graduate School of Education, The University of Melbourne.
Zahran, S., L. Peek, J. G. Snodgrass, S. Weiler and L. Hempel (2011). "Economics of disaster risk, social vulnerability, and mental health resilience." Risk analysis : an official publication of the Society for Risk Analysis **31**(7): 1107-1119.
Zubrick, S. R. (2014). School attendance: Equities and inequities in growth trajectories of academic performance. Quality and Equity: What does research tell us? https://research.acer.edu.au/research_conference/RC2014/4august/7.

Appendix 3: Draft parent resource about student school engagement post disaster

STUDENTS' CONNECTION TO THEIR SCHOOL AFTER DISASTER

NB. This will be converted by our design specialist Alana Pirrone into a visual design that is more appealing for a public audience

How do disasters affect school students?

Most students who are living in areas affected by disasters show incredible capacity to adapt and cope with change, particularly if they are in supportive home, school and community environments. While many will experience distress in the early stages, most will adjust and gradually recover. However, some will struggle with extended or delayed mental health, wellbeing and learning difficulties and may need professional support such as from school counsellors or a trauma psychologist if symptoms of distress (e.g. nightmares, anxiety, aggressive behaviour) continue for longer than 3 months.

Is it common for students to feel less engaged at school after disasters?

Students experiencing distress after a disaster will respond in different ways. Some students may find the shared experience of the disaster brings them closer to others in their school community, while others may find it difficult to engage in school activities if they are processing difficult emotions. The return to the routines and familiar school environment can often be helpful but students' feelings of connection to their school can be affected, particularly if they have been exposed to more than one disaster (e.g. bushfires and pandemic) and if they are dealing with other issues in their lives (e.g. moving house, parent separation). Secondary school students in particular may feel less connection to their school after a disaster.

Secondary school students are also more likely to miss classes or days at school, as are students experiencing other difficulties (e.g. mental illness, family financial hardship). The school culture is also important – high attendance levels before disasters are likely to continue afterwards. Many disaster recovery resources and support programs tend to be delivered through schools so if students are not attending school or if your family has moved to another area and school, it may be helpful to explore support options for them through other avenues if needed (e.g. GP, Beyond Blue, Kids Helpline).

How do disasters affect students' learning?

It is very common for students' learning to be disrupted during and after disasters. Sometimes this is for practical reasons, for example because the school buildings have been damaged or roads have been closed or it is not safe to be on campus. At other times it is because there are behaviour problems in class or because students have difficulty concentrating, processing or retaining information. These issues can arise because of trauma from exposure to the disaster event and from ongoing disruptions in the home, school or community environment. Many students will benefit from revision of core learning to catch up on content they missed or have trouble remembering.

How do disasters affect school staff?

Schools are really important community hubs, particularly after disasters, but the changes in the school environment do place significant extra demands on teachers. The school environment can be very disrupted and so there are many adjustments that need to be made to the teaching process, additional support needed for distressed students and parents, and many teachers are dealing with their own personal experiences of the disaster as well. It is understandable if parents feel frustrated with schools and short-tempered out of concern for their child, but it is helpful to remember everyone is doing their best and to work together with patience to achieve the best outcomes.

How can families be supported after disasters?

Disasters challenge students in many different ways and some will learn and grow from the experience, especially if they have been able to cope with the demands and feel proud of their achievements. However, disaster-related fear, uncertainty and disruption can also be very unsettling. Rather than trying to rapidly catch up on delayed learning it is likely to be more helpful to give students time to adjust and recover. Fortunately, there is growing evidence that programs to support children and teenagers after disasters can have a positive influence on their mental health and wellbeing. This includes support to restore the essential elements of recovery - their sense of safety, calm, hope, connectedness and efficacy (i.e. confidence that they can manage and their family and community can manage); programs to help them to manage ongoing symptoms of distress (e.g. anxiety, sleeping problems); and psychological treatment to help those with more severe difficulties.

Parents are likely to be dealing with their own post-disaster challenges and changes in the everyday experiences of the family. Self-care and support for parents is really important, for their own benefit and to enable them to support their children. It is also likely to be helpful to re-establish some daily family rituals (e.g. a regular short walk or reading a book together before bed) and creating space to do fun things together. Research indicates that younger children may benefit from reading support at home. Building maths activities into everyday life is also likely to support learning for younger students (e.g. working out the difference in game scores, or estimating the cost of buying something if there is a discount).

Here is a link to a guide to resources available for parents, families and children affected by disasters - https://www.redcross.org.au/get-help/emergencies/resources-about-disasters/resources-for-parents#recover

Here is a link to a guide to that focuses specifically on the experience of parenting after disasters - https://www.redcross.org.au/getmedia/bd0dacb7-f46b-45c8-8031-d045d0c1ee29/19060-RED-Crisis-Parents-Booklet-D10-Web.pdf.aspx

Acknowledgement: This resource and related research were supported by generous funding from the Erdi Foundation, Teachers Health Foundation and Victorian Department of Education and Training, and expert advice from the University of Melbourne Children & Disasters Advisory Group.

Contributing authors to this resource and the underlying research: Gibbs L, Cobham V, Marinkovic K, Cowlishaw S, Molyneaux R, Leppold C, Ulubasoglu M, Tekin E, Cesur R, Watterston J, Callard N, Baur J, Burns A, Meagher N, Kartal D, Tong L.A, Nursey J.

Further information about the underlying research for this resource can be found here: https://mspgh.unimelb.edu.au/centres-institutes/centre-for-health-equity/research-group/beyond-bushfires/research/related-projects/children-and-disasters

Appendix 4: Children & Disaster Committee membership

Australian Red Cross: Antonia Mackay; John Richardson

Phoenix Australia: Jane Nursey, Sean Cowlishaw

Department of Families, Fairness and Housing: Tim Hamilton

Teachers Health Foundation: Penny Jones, Joseph Phung

Department of Education and Training: Martina Holland

Emergency Management Victoria: Julia Brownlie

Swinburne University: Colin Gallagher

Smouldering Stump: Janette Cook (AM)

Community member/parent: Fiona Leadbeater, Jane Fraga (not able to attend meetings)

Young person with disaster experience: April Harrison

Child trauma psychotherapist: Ruth Wraith OAM

Psychologist: Michelle Roberts

Psychologist: David Younger

CatholicCare NSW: Gloria Melham

Curtin University: Elizabeth Newnham

Dept of Social Work, University of Melbourne: Louise Harms, Lauren Kosta

Save the Children: Catherine Harris, Howard Choo

Child Health & Wellbeing Program, University of Melbourne: Lisa Gibbs, Robyn Molyneaux, Lauren Carpenter, Greg Ireton, Katitza Marinkovic, Phoebe Quinn, Claire Leppold

Education consultant *(previously - Independent Education Union of Australia)***:** Amy Cotton

Bushfire Recovery Victoria: Yvette Clarke

Australian Childhood Foundation: Jenny Wing, Nicole Balfour

NSW Department of Education and Communities (Secondary Teacher): Madeleine Bye (not able to attend meetings)

Appendix 5: 2021 Report on psychosocial disaster recovery support programs and resources for school staff

Authors: Gibbs L[1,2], Kwong E[1], Wraith R[3], Younger D[4,1], Newnham E[5,6], Cook J[7,8]

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2. Centre for Disaster Management and Public Safety, University of Melbourne
3. Child trauma psychotherapist
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7. Educator
8. Smouldering Stump (National Charity supporting children affected by disasters)

Background

Natural disasters have been identified as one of the "most challenging crises to be addressed by the teacher" ((1), pp. 37), owing to the collective impact on schools and wider communities. School staff have an important role in supporting students and families following exposure to mass trauma events (2–7). The role of the school in supporting students and families can be particularly important when other local social networks and community facilities have been lost or disrupted. Our recent research in the Strengthening School Communities study identified that following the Black Saturday bushfires in Victoria in 2009, staff needed to primarily focus on restoring student wellbeing and supporting family recovery, while still meeting Departmental curriculum and reporting requirements. Teachers' own recovery needs were neglected as they prioritised student and family needs above their own self-care (8). This interplay between student and staff post disaster exposure is both a strength and a risk inherent in a setting in which there is an existing relationship between staff and students, and frequent and consistent contact in a familiar, controlled environment both before and after an event (9–11). Strategies to support staff capacity and resilience following a mass trauma tend to be variable (10), making it difficult to build evidence and establish consistent approaches. Further work is needed to provide guidance in relation to support packages available for staff in Australian school communities affected by disaster to reduce the risk of poor mental health and burnout.

Methodology

An expert-informed scoping and review of non-clinical recovery support programmes and resources suitable for school staff was conducted in 2020/21 to inform a guide for post disaster support options readily available in Australia.

Multiple sources of information were accessed in order to identify potential sources of non-clinical recovery support programmes and resources suitable for school staff. Programmes were considered eligible for inclusion if they were designed for delivery in the first two years after a disaster event, this excluded broader resilience and wellbeing programmes.

The collective expertise of the members of the Children and Disasters Advisory Committee was sought through a focussed discussion (see Appendix 4 for Committee membership) to identify known teacher support programmes and known organisations likely to have information about teacher support programmes such as: Emerging Minds; Australian Child and Adolescent Trauma, Loss and Grief Network (ACATLAGN); Phoenix Australia: Centre for Posttraumatic Mental Health; Arts Health Networks NSW/ACT; Department of Education websites in different states and Federal; teacher union websites including the Australian Education Union and their state branches; Australian Institute for Disaster Resilience (AIDR) Knowledge Hub; Australian Red Cross; Save the Children; UNICEF; and Beyond Blue. The search identified the addendum from the Student Health & Wellbeing systematic review, conducted by Dix et al. in September 2020 for the Australian Council for Education Research which listed school wellbeing programmes in Australia and indicated if they were for students, parents, educators/staff and/or leaders (12). All of the programmes which were listed as targeting educators, staff or leaders were included in this review.

Finalisation of the search process and determination of the appraisal process was discussed with a Children and Disasters Advisory Group sub-committee consisting of the report authors (RW, DY, EN, JC, LG, EK).

The exclusion criteria applied to the search included: if the programmes were no longer available, or no longer exist; do not relate to post-disaster support, either directly or indirectly; do not target educators/staff, or school leaders; or if there was insufficient information provided to ascertain their relevance or utility.

The appraisal process of the included programmes and resources included the following considerations:

i. Whether they address the five core principles of psychosocial recovery as outlined by Hobfoll and colleagues: a) promoting safety, b) promoting connectedness, c) promoting a sense of calmness, d) promoting a sense of self (and school) efficacy, and e) instilling hope
ii. Strength of evidence
iii. Accessibility for school staff in Australia
iv. Explicit considerations of cultural appropriateness and safety.

Findings

This review focused on existing programmes and resources. Many of the programmes and resources were not specifically designed as post disaster support options, but rather provided more generic wellbeing/resilience professional development or training, some of which were being adapted to be delivered in post disaster contexts. The majority did not distinguish clearly the target staff group of the training/resource provided, i.e. whether it was specifically for non-teaching staff, teaching staff, or school leadership, though some did distinguish between teaching and non-teaching staff.

Discussions with the expert members of the Children & Disasters Advisory Committee revealed that it is not unusual for State Departments of Education to arrange specialised trauma support services for disaster affected schools that are customised to each region or school community.

Education Unions also commonly arrange some form of support for educators such as webinars with academic and clinical experts as presenters. A combination of professional support and existing programmes may also be accessed by affected schools at different stages of their recovery experience and to address different support needs.

This review identified 16 psychosocial support programmes and resources available for teachers and other school staff in school communities affected by disasters. Though the list of programmes and resources in this review is not likely to be exhaustive, it is indicative of what is available within Australia (see Table 1). As noted in the Table, two of the programs received a Resilient Australia 2021 Award.

Table 1: Post-disaster teacher recovery support programs in Australia

Programs in the shaded section of the table align most closely with the appraisal criteria, based on publicly available program information. Programs in the unshaded section either did not align closely with more than one of the appraisal criteria or did not report relevant information publicly.

Emerging Minds Educators Workshop and E-Learning for Educators Provider: Emerging Minds Links: https://emergingminds.com.au/workshop/educators-workshop/ https://emergingminds.com.au/training/online-training/
Be You Bushfire Response Program (Recipient of Resilient Australia Award in 2021) Provider: Beyond Blue file:///C:/Users/lgibbs/Downloads/Bushfire%20Response%20Program%202020-2021.pdf
Royal Far West Bushfire Recovery Program (Suncorp Resilient Australia National Community Award 2021) Provider: Royal Far West https://www.royalfarwest.org.au/bushfire-recovery-program/
Berry Street Education Model Provider: Berry Street Link: https://www.berrystreet.org.au/learning-and-resources/berry-street-education-model
The Staff Wellbeing Toolkit Provider: National Excellence in School Leadership Institute

Link: https://www.nesli.org/staffwellbeingtoolkit.html
The Resilience Project Immersion Program Provider: The Resilience Project Link: https://theresilienceproject.com.au/immersion-program/
You Can Do It - School Professional Development Programs (Social-Emotional Learning for All & The Resilient Educator E-learning Program) Provider: You Can Do It Education Link: https://www.youcandoiteducation.com.au/professional-development-for-educators/
Real Schools Teacher Wellbeing Partnerships Provider: Real Schools Link: https://realschools.com.au/partnerships/
Mindful Breathing Teacher Training Provider: Breathe Project Link: https://breatheschool.com/teacher-training/
batyr@school – Teacher Professional Development Provider: Batyr Link: https://www.batyr.com.au/batyr-school/
BRIDGE BUILDERS Staff Professional Development Provider: Empowering Life Skills Link: https://empoweringlifeskills.com.au/bridge-builders-staff-professional-development/
Essential Basic & Consolidating Practices Training for Leaders of School Wellbeing Provider: WISA Wellbeing in Schools Australia Link: https://site.corsizio.com/a/5e1e4ce97e64f5cbed507088
Grow Your Mind - Introduction to Teacher Wellbeing/Staff Resilience Courses Provider: Grow Your Mind Link: https://growyourmind.life/pages/teacher-wellbeing
HeadRest – An Introduction to Mindfulness for Teachers

Provider: HeadRest Link: https://www.headrest.com.au/teachers-schools.html
Kindness on Purpose - Neuroscience Learning and Emotion Bootcamp for the Brain Provider: Kindness on Purpose Link: https://km6fbygh.pages.infusionsoft.net/
The Resilience Doughnut Adult Model Provider: The Resilience Doughnut Link: https://www.theresiliencedoughnut.com.au/product/licensed-training-resilience-doughnut-a-online/

Three of the programmes were specifically aligned with Hobfoll et al's principles for intervention following a mass trauma event – the Berry Street Education Model, the Emerging Minds Educators Workshop and the Royal Far West Bushfire Recovery Program. A number of others aligned with more than one of the principles, and all included self care strategies of some type that could be described as consistent with calming. Most programs indicated theoretical and empirical evidence supporting the content of available programs but there was generally very limited evidence supporting program implementation and outcomes, particularly in relation to the staff training components because evaluations tend to focus on student outcomes. For many of the programmes there was insufficient information available on the public websites to assess the strength of evidence for the programme.

Programme accessibility was assessed in terms of location of delivery, mode of delivery, and cost. Due to the COVID-19 pandemic, most of the programmes pivoted to offer online-only versions, as either pre-recorded training videos, or live webinar sessions. Programmes varied in mode of delivery including training, facilitation, peer learning and self-paced completion of training modules. Costs of the programmes also varied considerably ranging from free, or relatively inexpensive programmes through to $1402 per participant.

Only two of the programmes briefly mentioned considerations of cultural appropriateness and safety for their training cohorts in their programme information, but these factors may be addressed in programs that are tailored to the school community context which are provided by many consultants provide tailored recovery programmes to schools and school staff after disaster exposure. This is often coordinated by the Education Department and by Education Unions. This approach allows the support programmes to be customised to the hazard, context and culture of the school communities. This is likely to be highly beneficial, providing it is being delivered by a practitioner with specialist training in psychosocial support following mass trauma events. This sort of health practitioner training is provided by Phoenix Australia (https://www.phoenixaustralia.org/disaster-hub/training/). Consultants providing a tailored approach to schools should also be able to provide guidance about further support from existing programmes that may suit the needs of the staff and the school communities at different stages of recovery.

Further teacher resources such as information sheets were found to be available through a number of well-regarded support organisations (see Table 2):

Table 2: Relevant teacher resources providing post disaster guidance

Organisation	Link to resources
Beyond Blue	https://beyou.edu.au/fact-sheets/grief-trauma-and-critical-incidents/educator-wellbeing-after-a-natural-disaster
Emerging Minds	https://emergingminds.com.au/resources/toolkits/community-trauma-toolkit/educators/
Australian Child and Adolescent Trauma, Loss and Grief Network (ACATLAGN)	https://earlytraumagrief.anu.edu.au/resource-centre/disasters-bushfire-resources
Tasmanian Department of Education	https://publicdocumentcentre.education.tas.gov.au/library/Shared%20Documents/Good-Teaching-Trauma-Informed-Practice.pdf
Phoenix Australia	https://www.phoenixaustralia.org/disaster-hub/?s=self-care
The Arts Health Network NSW/ACT	https://www.artshealthnetwork.com.au/advice-for-principals-and-teachers/
Australian Education Union	http://www.aeuvic.asn.au/training-events/training-videos https://www.qtu.asn.au/QuEST
Australian Red Cross	https://www.redcross.org.au/get-help/emergencies/resources-about-disasters/resources-for-teachers
AIDR Knowledge Hub	https://knowledge.aidr.org.au/

State-based Departments of Education also offer resources and/or support programmes to school staff in post-disaster settings, however not everything is available publicly. Some information and resources were password-access only to school staff of that particular state. Based on the publicly available information, it appears that the departmental resources and programmes made available vary across States and Territories. It was a similar situation for the Education Unions, where most of the resources available required login details to access password-protected sections of the website.

The research team were separately commissioned by the Victorian Department of Education and Training to develop the APPRAISE tools for school leaders to select the support programmes most relevant for their school community (13). This review provides additional information about programs and resources available for consideration.

The appraisal criteria were found to be useful in reviewing available programmes. These criteria are not all-inclusive, but rather are indicative of programme relevance and usefulness in the post disaster context and may be useful for appraisals of future programmes and resources. This review has highlighted the need for further research to build evidence about the contribution of post disaster psychosocial support programmes to support teacher health and wellbeing.

Conclusion

A review of psychosocial disaster recovery options available for school staff in Australia identified 16 programs and 9 sources of educator resources. The programs varied in content, delivery mode, strength of evidence and accessibility. The option which aligned most closely with the appraisal criteria, including high levels of accessibility across Australia, was the suite of programs and resources for educators provided by Emerging Minds. This program is recommended by Beyond Blue following completion of their own Resilient Australia award-winning Be You Bushfires Response program. Many tailored programs are also delivered to school staff by trauma specialists following disasters. It is likely that a combination of tailored support and readily accessible programs and resources are likely to be most beneficial to staff over the weeks, months and years following a major disaster.

References

1. Damiani V. Crisis prevention and intervention in the classroom: What teachers should know. R&I Education; 2006.
2. Mutch C. The role of schools in disaster settings: Learning from the 2010-2011 New Zealand earthquakes. International Journal of Educational Development. 2015;41:283–91.
3. Parmenter L. Community and citizenship in post-disaster Japan: The roles of schools and students. Journal of Social Science Education. 2012;11(3):6–21.
4. Tarrant R. Leadership through a school tragedy: A case study (Part 1: The first week). Australasian Journal of Disaster and Trauma Studies. 2011;3(2):65–76.
5. Tarrant R. Leadership through a school tragedy: A case study (Part 2: The next two years). Australasian Journal of Disaster and Trauma Studies. 2011;3(2):77–87.
6. McDermott B, Cobham V. A road less travelled: A guide to children, emotion and disasters. Queensland, Australia: TFD Publishing; 2012.
7. Rolfsnes E, Idsoe T. chool-based intervention programs for PTSD symptoms: A review and meta-analysis. Journal of Traumatic Stress. 2011;24:155–65.
8. Gibbs L, Nursey J, Molyneaux R, Marinkovic K, Quinn P. Strengthening School Communities Final Report to Teachers Health Foundation: Building teacher and school capacity to cope with trauma impacts on children. Melbourne, Australia: Jack Brockhoff Child Health & Wellbeing Program, University of Melbourne; 2019.
9. Nastasi B, Overstreet S, Summerville M. School-based mental health services in post-disaster contexts: A public health framework. School Psychology International. 2011;32(5):533–52.
10. Green J, Holt M, Kwong L, Reid G, Xuan Z, Comer J. School- and Classroom-Based Supports for Children Following the 2013 Boston Marathon Attack and Manhunt. School Mental Health. 2015;(7):81–91.

11. Barrett E, Ausbrooks C, Martinez-Cosio M. The Tempering Effect of Schools on Students Experiencing a Life-Changing Event Teenagers and the Hurricane Katrina Evacuation. Urban Education. 2012;47(1):7–31.
12. Dix K, Ahmed SK, Carslake T, Sniedze-Gregory S, O'Grady E, Trevitt J. A systematic review of intervention research examining effective student wellbeing in schools and their academic outcomes. Addendum: Wellbeing Programs in Australia. Melbourne: Evidence for Learning; 2020.
13. Gibbs L, Young D, Marck C, Nursey J, Cook J, Wraith R, et al. APPRAISE: Tools to guide selection of school-based post-disaster psychosocial programs, Report to Victorian Department of Education and Training [Internet]. Child and Community Wellbeing Unit, University of Melbourne; 2020 Jul. Available from: https://mspgh.unimelb.edu.au/__data/assets/pdf_file/0019/3525022/Appraise-report_combined.pdf

Appendix 6: Child and adolescent psychosocial support programs following natural disasters – a scoping review of emerging evidence (published article)

Current Psychiatry Reports (2021) 23:82
https://doi.org/10.1007/s11920-021-01293-1

CHILD AND FAMILY DISASTER PSYCHIATRY (B PFEFFERBAUM, SECTION EDITOR)

Child and Adolescent Psychosocial Support Programs Following Natural Disasters—a Scoping Review of Emerging Evidence

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Accepted: 5 September 2021

Abstract

Purpose of Review This review aimed to identify and describe evidence published in the past 3 years from trials of psychosocial support programs for children and adolescents affected by natural disasters.

Recent Findings Previous reviews have indicated these programs are beneficial overall. Positive impacts were documented in school-based programs conducted by trained teachers and paraprofessionals with stronger effects achieved by more qualified professionals.

Summary The review found supporting evidence for positive impacts of post-disaster psychosocial programs. However, the strength of evidence is limited due to heterogeneity in interventions and evaluations. The stepped care model was found to be useful in differentiating between programs and level of available evidence. Hobfoll's five essential elements of mass trauma intervention provide an additional means of guiding program content and assessments, particularly for universal programs. Identified gaps in evidence included groups likely to be at most risk: preschool children, ethnically diverse groups, those with disability, and social disadvantage. There were promising indications of program benefits for groups with repeated exposure to natural disasters.

Keywords Child · Adolescent · Disaster · Mental health · Recovery · Intervention

Introduction

It is well established that there is an increased risk of mental health problems for both adults and children in the aftermath of a mass trauma event such as a natural disaster [1, 2], arising from direct exposure to the hazard event as well as the associated losses and disruptions in the following months and years. While many children show signs of initial distress in the aftermath of a natural disaster, most children are expected to recover with the support of family, friends and the school community. A significant minority, however, have lingering mental health problems and are in need of additional support to recover and function normally [1, 3].

This article is part of the Topical Collection on *Child and Family Disaster Psychiatry*

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Published online: 15 October 2021

Pre-disaster experiences of adversity, family circumstances and community levels of disruption are all likely to influence the extent of impact on child health and wellbeing [4]. Even in an event such as the COVID-19 pandemic during which children have been shown to be much less susceptible to the virus than adults, family-level distress and conflicts, overburdened healthcare systems, school closures and social and economic difficulties can still leave children vulnerable. These problems may adversely affect food security, disrupt cognitive and emotional development, impair access to social and medical services and increase the likelihood of exposure to family violence [5, 6].

There has been increasing recognition of the need for appropriate disaster recovery support programs for children and adolescents over the past two decades. These programs can be difficult to operationalise in the upheaval of a post-disaster environment. Given the increasing risk of disasters occurring with more frequency, severity and complexity due to climate change, it is imperative to monitor emerging evidence about which programs are likely to provide the most effective support and which program delivery modes are likely to be feasible and appropriate in post-trauma settings.

The Australian and International Guidelines for the Treatment of Acute Stress Disorder and Posttraumatic Stress Disorder recommend a stepped care approach to post-disaster psychosocial recovery for both children and adults [7]. In the post-disaster context, a stepped care model assumes resilience, but offers recovery support at the community level in the first days and weeks after a disaster, followed by increasingly intensive, targeted, transdiagnostic interventions for those demonstrating ongoing distress and/or who are identified as being at risk of developing a mental health disorder. This approach relies on effective screening and triage practices to ensure those at risk are identified and provided access to the appropriate level of care as early as possible [8].

Level 1 in the stepped care approach, identified as universal care, promotes recovery by offering support, education and advice on self-care strategies such as calming techniques and social connectedness. Psychological First Aid (PFA), based on five essential elements of immediate and mid-term mass trauma intervention identified by Hobfoll et al. [9]—namely safety, connectedness, self and collective efficacy, calm and hope, is an example of a level 1 universal intervention. There are multiple versions and implementation guides for PFA, including directions written specifically for use with children [10, 11].

Level 2 specifies both "selective" and/or "indicated" interventions that are targeted at those exhibiting continued signs of distress or sub-clinical signs of a mental health disorder in the months following the disaster. These early intervention programs usually offer some skills training in adaptive coping aimed at building resilience and reducing the risk of developing a posttraumatic mental health disorder. An example of a level 2 intervention developed by an international panel of trauma experts for use with children, adolescents and adults is Skills for Psychological Recovery (SPR) [12]. Another is Skills for Life Adjustment and Resilience (SOLAR) [13]. Appropriately, trained health care professionals or community support personnel can deliver these interventions at either a primary care or community level.

Level 3 interventions are high-intensity, evidence-based psychological therapies aimed at treating diagnosed posttraumatic mental health disorders and must be delivered by specialist mental health professionals. Interventions with the strongest evidence base are Trauma-Focused Cognitive Behavioural Therapies and can be transdiagnostic in nature or targeting a specific disorder.

While the stepped care approach is widely endorsed by trauma specialists and treatment guidelines internationally, the evidence supporting its effectiveness has been slow to develop, particularly regarding level 1 and 2 and child-focussed interventions. However, recent meta-reviews have identified a range of post-disaster psychological and psychosocial interventions for children and adolescents that demonstrate those receiving interventions fared better than those in control or waitlist groups [14–16]. The strongest evidence available was for eye movement desensitization therapy (EMDR), Exposure and Strict Cognitive Behavioral Therapy (CBT) in level 3 interventions [14]. While pre-post studies present evidence of stronger effects when programs were delivered by qualified professionals, and when delivered to individuals rather than groups, these differences in effect sizes were lower or absent in the controlled studies [15]. A meta-review of level 1, school-based programs delivered post disaster and published between 2000 and 2015 [16] showed that "school-based, universal programmes that are conducted by teachers or local paraprofessionals are effective in reducing PTSD symptoms in children and adolescents" (p. 161). This finding of the effectiveness of school-based programs is also supported by a previous meta-analysis of school-based (level 3) treatment programs targeted at reducing symptoms of PTSD arising from exposure to various forms of trauma including disaster [17]. All the reviews used measures of psychological distress or PTSD as the outcome measure regardless of whether the intervention was universal (level 1), targeted (level 2) or treatment (level 3). Arguably, measures of PTSD symptoms or any other diagnosable mental health disorder are not appropriate for a level 1 intervention given those interventions do not target specific disorders. Even if used as a screening tool, students with sub-clinical symptoms should be directed to a level 2 intervention and those with more severe symptoms

to a level 3 intervention. A common recommendation was to conduct further studies with larger samples. Brown and colleagues [15] suggested that the evidence supported a stepped care approach that provides individual treatments for those with high need and a small number of group treatment sessions for those with lesser needs.

The challenges associated with conducting clinical trials and evaluating the effectiveness of interventions in post-disaster environments are well-known, with multiple factors contributing to the complexity, not least of which is the heterogeneity of program models offered and a lack of identified consistent outcomes and goals [18, 19]. Shultz and Forbes (18, p. 8) outline several questions and processes that might be used as a framework to guide evaluation of PFA. At a minimum, they suggest that "The "five essential elements" identified by Hobfoll and colleagues (safety, calming, connectedness, self-efficacy and hope) might be considered the best "standard" available for assessing the coverage of various PFA frameworks." These elements were developed through expert consensus to guide intervention and prevention efforts following mass trauma events. They were developed in 2007 by extrapolating from related fields of research in the absence of direct evidence at the time. Using them now to review emerging evidence provides the dual benefit of providing a structure for differentiating between available interventions, while also building the evidence for each of the principles.

The goal of this scoping review is to identify any emerging psychosocial interventions and/or new evidence regarding existing disaster recovery programs for children and adolescents that would help inform best practice. The review employs the stepped care model as a structure for differentiating the intervention studies and the presentation of findings.

Methods

This review was conducted using a scoping review approach informed by Arksey and O'Malley [20]. This approach was consistent with the review's aim to explore recent trends and developments across a wide range of interventions that were designed and assessed based on an array of theoretical and methodological frameworks.

The final search was conducted on 18 May 2021 across the following databases: Cochrane Library, EMBASE, Family & Society Studies Worldwide, Global Health, Medline, PILOTS (Published International Literature on Traumatic Stress), PsycINFO, Scopus, SocINDEX, and Web of Science and article reference lists. In keeping with the journal focus, the review scope was studies published in the last 3 years.

Inclusion criteria are articles that (a) are peer-reviewed primary research or reviews of primary research, (b) are published in English, (c) are published between 1 January 2018 and 18 May 2021, (d) assess interventions implemented in the aftermath of a natural[1] disaster, (e) target interventions focusing on child mental health (understanding children as all people under 18 years old).

The review data were categorised according to the stepped care model and the literature on the key elements of interventions for disaster-affected communities. Two team members (KM and LT) developed the evidence table with six test articles. They then independently extracted information from all included articles based on the following categories:

- Study details (reference, organisations involved, name of program/intervention, country/region, type of disaster)
- Level of intervention in the stepped care model
- Elements of interventions (program features, participants and scale, program modules and modality, delivery mode, provider credentials, costs, level of evidence for the program and barriers).
- Alignment of intervention with one or more of the five essential elements of recovery—i.e. safety, calming, connectedness, efficacy and hope.
- Discrepancies in study selection and data extraction were resolved in collaboration with other members of the research team (LG and JN). The final step was to collate, summarize and synthesize the extracted information, based on the following guiding questions:
- When and where were the interventions implemented?
- What type of interventions were delivered?
- How did the interventions align with the five essential elements of disaster recovery?
- How were the interventions delivered?
- Who received the interventions?
- What intervention evaluation study designs were used?
- What were the outcomes and impact of the interventions?

Results

A total of 18 studies were identified, including 13 primary research articles and 5 literature reviews (see Fig. 1).

The 5 literature reviews aimed to compare the effects of different interventions on PTSD, depression, and anxiety [21, 22•, 23, 24••], and identify the factors that influence

[1] We acknowledge the term "natural disasters" is contested because of the human/social influences on these events but use it here as a useful distinction from disasters arising from acts of violence such as terrorism and war.

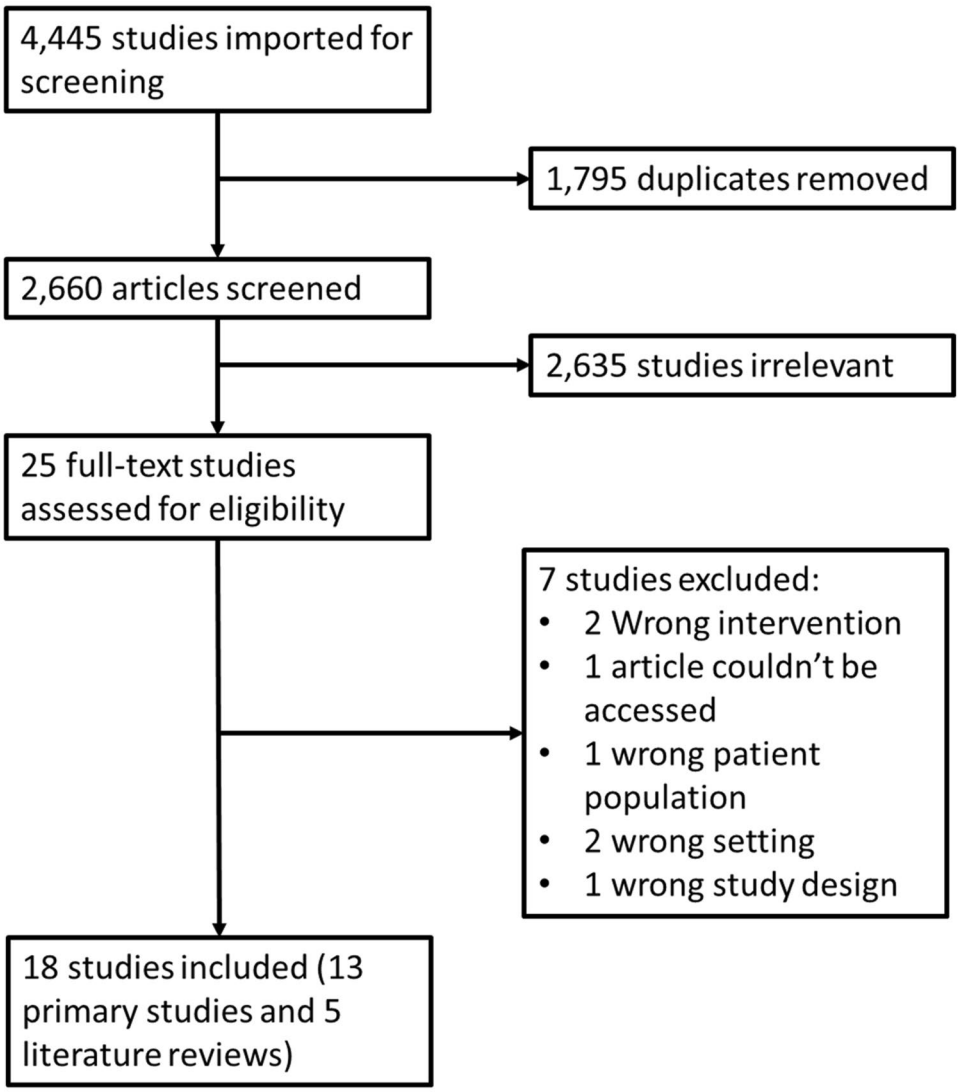

Fig. 1 Flow chart for the process of study selection

the delivery and effectiveness of interventions [22•, 24••]. In terms of the nature of the event, one review [21] focused on different types of natural disasters, while the rest explored interventions delivered in a wider range of potentially traumatic experiences [22•, 23, 24••], including disasters, sexual and physical abuse, war, terrorism and other humanitarian crisis. Additionally, one review [25] focused on identifying interventions for children and families in the context of COVID-19 and comparable outbreaks. No further description of the reviews will be provided in these results because they assessed studies that were either conducted prior to 2018 or were captured in this scoping review. However, the literature reviews will be referred to throughout the discussion to indicate similarities and differences in the findings that have emerged from the more recent primary research studies.

The 13 primary research studies corresponded to 13 different interventions and will now be described in detail in the results below.

When and Where Were the Interventions Implemented?

The studies identified by this review were carried out in different countries across Asia [26, 27•, 28, 29•, 30, 31], the Americas (four, with two interventions from the USA [32, 33] and two from Canada [34, 35], Europe [36•], Africa [37] and Oceania [38]).

Table 1 summarizes the main characteristics of the interventions identified in this review. The interventions were carried out between 2006 and 2020, although four studies did not report when the post-disaster intervention occurred (and how long after the disaster) or its duration. Four interventions were implemented while the COVID-19 pandemic was happening [30, 32, 34, 35], two interventions were carried out within a few months of a disaster [29•, 37] and three interventions were implemented 1 year after the disaster or shortly after the first anniversary [26, 33, 38].

Table 1 Summary of interventions and their main characteristics

Level of intervention	Reference	Intervention	Location	Type of disaster/year	Setting	Time of implementation	Aim	Activities	Duration of intervention	Delivery schedule
Level 1	Akiyama et al. [26]	Mastery Approach to Coaching (MAC)	Leyte, Philippines	Typhoon Haiyan (2003)	School/in person	January–February 2015, 14 months after the disaster	Improving self-esteem	Sports (volleyball), intra-school tournaments	2 months	Recommended minimum of 1 h a day, 4 times per week
	Decosimo et al. [37]	Playing to live	40 sites across Liberia	Ebola pandemic (2013–2015)	Community/in person	May–November 2015, approximately 6 months after the Ebola pandemic	Building healthy relationships, trauma coping skills and a safe space for children to express themselves	Art, play, and storytelling to explore what children want for their future	7 months	2–3 times per week
	Hasanudin et al. [28]	Therapeutic group therapy (TKT)	East Java, Indonesia	Kelud Mountain disaster (volcanic eruption) (2014)	School/in person	Information not available	Promoting self-efficacy	Games and group discussions	Information not provided	Information not provided
	Malboeuf-Hurtubise et al. [35]	Online philosophy for children and mindfulness interventions	Eastern Townships region, Quebec, Canada	COVID19 pandemic (2020)	School/online	May–June 2020, during the COVID-19 pandemic	Reducing anxiety, depression, inattention and hyperactivity symptoms	Emotion-based directed drawing, drawing of mandalas	5 weeks	5 weekly sessions of 45 min each
	Malboeuf-Hurtubise et al. [34]	Online art therapy	Eastern Townships region, Quebec, Canada	COVID19 pandemic (2020)	School/online	May–June 2020, during the COVID-19 pandemic	Reducing anxiety and inattention symptoms and improving basic psychological needs satisfaction	Philosophy for children, group discussions, mindfulness exercises	5 weeks	5 weekly sessions of 45 min each
	Osofsky et al. [33]	Youth Leadership Program (YLP)	New Orleans, USA	Hurricane Katrina (2005)	School/in person	2006–2008, 2 years after the disaster	Improving student wellbeing	Volunteering, disaster risk reduction, summer program, 1 leadership summit	2 years	Varied across time, groups and schools

Table 1 (continued)

Level of intervention	Reference	Intervention	Location	Type of disaster/year	Setting	Time of implementation	Aim	Activities	Duration of intervention	Delivery schedule
Level 2	Amin et al. [27•]	Support for Students Exposed to Trauma (SSET) program	Multan, Southern Punjab, Pakistan	Successive floods	School/in person	August 2015–February 2016	Reducing PTSD symptoms, building resilience and social support	Psychoeducation, relaxation techniques, cognitive restructuring, behavioural exposure, social problem-solving	10 weeks	10 weekly sessions of 45 min each
	Ding and Yao [29•]	Model 328 peer education intervention	Hunan and Guangxi provinces, China	COVID-19 (2020)	School/online	February–March 2020, during the COVID-19 pandemic	Improving mental health	Youth-led online live webcasts and aerobic exercise	2 months	Twice a day, 3 times a week
	Yuan [30]	Online mindfulness intervention	China	COVID-19 (2020)	School/online	February 2020, during the COVID-19 pandemic	Improving resilience and emotional intelligence	Mindfulness exercises	Information not provided	15 min a day for 6 months
	Yustiana et al. [31]	Group play therapy	Banten Province, Indonesia	Earthquake and tsunami (2019)	School/in person	Information not available	Reducing PTSD symptoms	Group play therapy	Information not provided	Information not provided

Table 1 (continued)

Level of intervention	Reference	Intervention	Location	Type of disaster/year	Setting	Time of implementation	Aim	Activities	Duration of intervention	Delivery schedule
Level 3	Lee and Simpson [32]	Three-Step, Single Session Therapy Intervention	United States of America	COVID19 pandemic (2020)	Paediatric emergency department/in person	Information not available	Reducing anxiety symptoms	Psychoeducation, cognitive and behavioural techniques, goal setting	1 session	10 sessions (20–45 min) for young people, 5–6 sessions for parents, completed at their own pace
	Stasiak et al. [38]	BRAVE-ONLINE (cognitive-behavioural therapy program)	Christchurch, New Zealand	Canterbury Earthquakes (February 2011), followed by over 10,000 aftershocks in the following 18 months	School/online	Between 2012 and 2013, 14 and 20 months after the disaster	Anxiety management	Standard CBT anxiety management techniques in two versions: 7–12 and 13–18 years old. Psychoeducation for parents	12 weeks	3 weekly sessions, 60–90 min each
	Trentini et al. [36•]	EMDR Integrative Group Treatment Protocol (EMDR-IGT)	Town of Norcia and surrounding villages in the Umbria region, Italy	2 consecutive earthquakes (2016)	School/in person	Information not available	Reducing PTSD and emotional distress	EMDR sessions	3 weeks	10 sessions (20–45 min) for young people, 5–6 sessions for parents, completed at their own pace

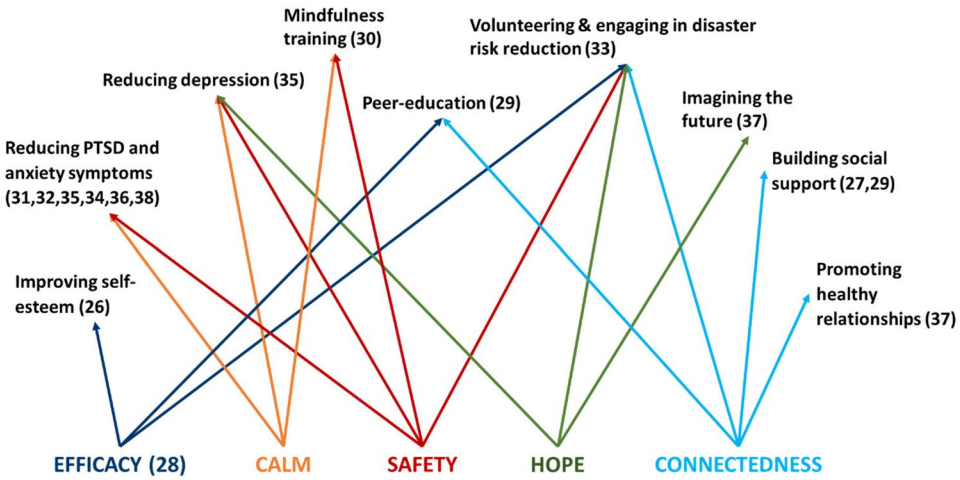

Fig. 2 Intervention alignment with the five essential elements of disaster recovery

Interventions for child mental health were performed in response to pandemics—mostly COVID-19 [29•, 30, 32, 34, 35, 37], earthquakes [31, 36•, 38], floods [27•], hurricanes [33], tsunamis [31], typhoons [26] and volcanic eruptions [28]. Ten out of thirteen interventions were carried out in school contexts [26, 27•, 28, 29•, 30, 31, 33–35, 36•]. Eight interventions were delivered face to face [26, 27•, 28, 31–33, 36•, 37], while the rest were online [29•, 30, 34, 35, 38]. Almost all the online interventions [29•, 30, 34, 35] were designed in response to the challenges of accessing children during the COVID-19 pandemic in 2019–2020, with one exception that was delivered after an earthquake [38]. This was the only study to report problems caused by frequent technological glitches and high attrition rates.

Most interventions were delivered by clinically trained personnel and mental health professionals [27•, 31–33, 36•, 38], or by researchers with a background in mental health [28, 29•, 34, 35]. Four studies reported that interventions were delivered by or with the support of local teachers [26, 30, 33] or community workers [37], but did not provide details on whether these deliverers had also been affected by the disaster themselves.

What Type of Interventions Were Implemented?

The interventions identified in this review were based on a diverse set of frameworks, drawing mostly from therapeutic approaches like cognitive-behavioural therapy [27•, 32, 38], EMDR [36•], art therapy [35, 37], yoga therapy, play therapy, child development [37] and group therapy [28, 31], but also from mindfulness [30, 34], philosophy for children [34], health promotion and education [29•, 33], community-based interventions [33], coaching [26] and peer education [29•] (see Appendix 1).

Table 1 shows that the most common aim for interventions was to reduce symptoms of psychological distress (e.g. anxiety, mood, inattention and hyperactivity) and improve coping skills [27•, 31, 32, 34, 35, 36•, 37]. Other interventions aimed to promote resilience and emotional intelligence [27•, 28, 30], social support [27•, 29•], self-expression [37], self-efficacy [28] and self-esteem [26]. Only one intervention explicitly aimed to engage children and youth in disaster recovery activities [33].

Six interventions corresponded to level 1 in the stepped care model [26, 28, 33–35, 37], four interventions were classified as level 2 [27•, 29•, 30, 31] and three interventions corresponded to level 3 [32, 36•, 38]. Most interventions ($N = 10$) were delivered in groups [26, 27•, 28, 29•, 31, 33–35, 36•, 37] and three were delivered to individual children [30, 32, 38]. The activities used to promote mental health varied greatly across interventions. They included sports [26, 29•], psychoeducation [27•, 32, 38], mindfulness, meditation or relaxation techniques [27•, 30, 34], cognitive and behavioural restructuring techniques [27•, 32, 38], art [35, 37], play [31, 37], group therapy techniques [28], philosophy discussions [34], volunteering in the community [33], engaging in disaster recovery [33], and EMDR group sessions [36•]. Most interventions had fixed contents, meaning they were designed to deliver standardised content in a standardised format [26, 27•, 28, 29•, 30, 34, 35, 37, 38], although researchers in one study reported that the frequency of sessions could not be kept the same across sites [26]. In two other studies, researchers reported that the intervention was outlined in broad terms and then tailored to the needs of the community [33] or individual patient being targeted [36•].

How Did the Interventions Align with the Five Essential Elements of Disaster Recovery?

Figure 2 shows how the different interventions aligned with the five essential elements of disaster recovery (safety, calm,

connectedness, efficacy, hope) [9]. Only one intervention [28] explicitly stated an intent to address one of the five elements: self-efficacy. However, for the rest of the interventions, it was possible to link their objectives with different elements.

From this perspective, most interventions served to promote a sense of safety ($N=9$), followed by calm ($N=8$), connectedness ($N=5$), efficacy ($N=4$) and hope ($N=3$). All the interventions that addressed connectedness [27•, 29•, 33, 37] and hope [33, 34, 37] were classified as either level 1 or 2 interventions. Some interventions also included additional components such as physical health aspects (sleep and exercise).

How Were the Interventions Delivered?

The duration of interventions ranged from a single session to 2 years, with the majority lasting about two months (Table 1). The scale of interventions varied from a sub-section of a school [34, 35], to school-wide [26, 33], to different locations within a city [38], region or nation [37] (Appendix 1).

Most interventions involved multiple sessions at regular intervals, that lasted between 45 and 60 min (Table 1). Most interventions had weekly sessions [27•, 33–35, 36•], and three had more than one session per week (between 2 and 4) [26, 29•, 37]. Exceptions included, a single-session intervention [32], a 10-session online self-paced intervention [38] and brief daily mindfulness exercises [30].

Who Received the Interventions?

All the interventions identified in this review worked directly with children to support their mental health and almost all of them ($N=10$) were delivered to groups of children [26, 27•, 28, 29•, 31, 33–35, 36•, 37] (Appendix 2). Some targeted children between ages 7 and 13 [27•, 34, 35]; others worked with different ages and stages [31, 33, 37] but did not report how they tailored activities to the different ages, except one intervention [38] which reported two different modes of delivery: for ages 7–12 years and for 13–18 years. Three studies [28, 31, 36•] did not report the age of the children receiving the intervention. No interventions were specially developed for preschool children. Five interventions also offered support and information to parents/caregivers [27•, 32, 37, 38] or teachers [31].

What Intervention Evaluation Study Designs Were Used?

A range of study designs were used to assess the impact of the interventions (see Table 2). The randomised experimental trials and randomised cluster trials provide the greatest strength of evidence in terms of study design [27•, 29•, 34, 35] but sample sizes were small (ranging from 22 to 141 participants). Quasi-experimental trials were also common [26, 28, 30, 31, 33] (where participants are not randomly assigned to the intervention or the control group). Importantly, only one study [33] carried out a longitudinal analysis of the impacts of an intervention 2 years after the disaster.

Table 2 also shows that the sample size varied greatly across all the studies, from 1 to 332 children. Small sample size was a common limitation reported by studies [26, 34, 35]. Most studies reported the age and gender of children and aimed to achieve a balance between female and male participants. Only three studies reported on the involvement of children from minority groups [27•, 33, 38]. None of the studies reported involvement of children with disabilities. Only two studies [27•, 38] reported the socioeconomic status (SES) of their participants but did not use that data to examine the effect of SES or to adjust for SES in assessment of intervention impacts.

Table 2 also shows the interventions according to their expected outcomes and measures, demonstrating the wide range of standardised measures used to evaluate outcomes related to different aspects of children's mental health, behaviour and wellbeing. Only one study [33] incorporated a measure of children's level of disaster exposure before receiving the intervention.

What Were the Outcomes and Impact of the Interventions?

Considering the study limitations in strength of evidence as described in the previous section, the studies considered in this review suggested an overall positive impact of the different interventions in terms of reducing PTSD symptoms, depression, anxiety, sleep problems and promoting resilience, perceived social support and self-efficacy [26, 27•, 28, 29•, 31–35, 36•, 37].

However, findings were often mixed in terms of which aspects of the interventions were most effective and which sub-groups benefitted the most. One study reported that the intervention using group play therapy helped decrease PTSD symptoms including intrusions, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity [31], and another study [36•] found that EMDR group interventions were more effective in females and older children. While most level 2 and 3 studies included a measure of PTSD symptoms, almost all the PTSD and other outcomes were determined using self-report measures. Only two level 3 studies [32, 38] determined anxiety symptoms through diagnosis from a specialized clinician.

In relation to interventions that also had a component to support teachers [31] or parents/caregivers [27•, 32, 38], only one study [31] assessed the impact of the intervention

Table 2 Summary of evaluation design and methods

Level of intervention	Reference	Methodology	Sample size	Outcomes	Outcome measures	Level of exposure measures
Level 1	Akiyama et al. [26]	Quasi-experimental trial	293	Self-esteem (self-reported)	Rosenberg's Self-esteem Scale	None
	Decosimo et al. [37]	Uncontrolled experimental trial	233	Psychological stress symptoms (self-reported)	Self-report locally developed checklist to assess withdrawal, extreme anger, bedwetting, worry/anxiety, poor eating habits, violence and continual sadness	None
	Hasanudin et al. [28]	Quasi-experimental trial	56	Resilience (self-reported)	Information not provided	None
	Malboeuf-Hurtubise et al. [35]	Randomised cluster trial	22	Mental health difficulties (self-reported) Emotional Intelligence (self-reported) Basic psychological need (BPN) satisfaction (self-reported)	Selected items related to anxiety and inattention from Behavior Assessment Scale for Children-3rd edition, self-report scale (BASC III) (Reynolds and Kamphaus, 2004) BPN satisfaction 5-item scale developed by the research team	None
	Malbouef-Hurtubise et al. [34]	Randomised cluster trial	37	Mental health symptoms (self-reported) Mindfulness (self-reported)	Behavior Assessment Scale for Children-3rd edition (BASC III) Reynolds & Kamphaus (2004) Mindful Attention Awareness Scale for Children awlor (Schonert-Reichl, Gadermann & Zumbo, 2014)	None
	Osofsky et al. [33]	Quasi-experimental longitudinal study based on secondary data	212	Self-efficacy (self-reported) Trauma Symptoms (self-reported)	Self-reported Status Questionnaire for Students (specially developed for this study) Locally adapted version of the National Child Traumatic Stress Network Disaster Interview	National Child Traumatic Stress Network Disaster Interview: yes/no questionnaire for students Yes/no questionnaire about additional trauma exposure (other than disaster)

Table 2 (continued)

Level of intervention	Reference	Methodology	Sample size	Outcomes	Outcome measures	Level of exposure measures
Level 2	Amin et al. [27•]	Randomised experimental trial	75	PTSD symptoms (self-reported) Social Support (self-reported) Resilience (self-reported)	Child PTSD symptoms Scale-V (CPSS) (Foa, Johnson, Feeny & Treadwell, 2001) Child and Adolescent Social Support Measure (CASSS; Malecki, Demaray, Elliot & Nolten, 1999) Child and Youth Resilience Measure (CYRM-28) (Ungar & Liebenberg, 2009)	None
	Ding and Yao [29•]	Randomised experimental trial	141	Anxiety (self-reported) Depression (self-reported) Sleep patterns (self-reported)	Self-rating anxiety scale (SAS) (Zung 1971) Self-rating depression scale (SDS) (Zung 1965) Pittsburgh Sleep Quality Index (PSQI) (Buysse et al. 1989)	None
	Yuan [30]	Quasi-experimental trial *(only the control group was randomly assigned)*, latent growth modelling	174	Resilience (self-reported)	Connor–Davidson Resilience Scale (CD-RISC), translated and adapted to the Chinese context by (Yu & Zhang, 2007) Emotional Intelligence Scale (EIS) by Schutte et al (1998, 2001) and translated by Wang (2002)	None
	Yustiana et al. [31]	Quasi-experimental trial	25 students (23 were under 18 years old)	PTSD symptoms	Information not provided	None

Table 2 (continued)

Level of intervention	Reference	Methodology	Sample size	Outcomes	Outcome measures	Level of exposure measures
Level 3	Lee and Simpson [32]	Case study	1	Anxiety and somatic symptoms (assessed through clinical interview)	Child and parents' report of anxiety and somatic symptoms	None
	Stasiak et al. [38]	Pragmatic open feasibility trial	42	Anxiety (assessed through clinical interviews) Anxiety (self-reported) Depression (self-reported) Health-related quality of life (self-reported) Overall functioning (self-reported) Program satisfaction (parents and children) (self-reported)	Anxiety Disorders Interview Schedule for DSM-IV: Child and Parent versions (ADIS-C/P) Spence Children's Anxiety Scale (SCAS) (Spence, 1997) Mood & Feelings Questionnaire (MFQ-S) Short version (Angold et al., 1995) Child Health Utility 9D (CHU9D) Children's Global Assessment of Functioning (CGAS) (Shaffer et al., 1983) 8-item questionnaire used by the program developers (Spence et al., 2006)	None
	Trentini et al. [36•]	Uncontrolled experimental trial, linear mixed-model repeated measures	332	Emotional disorders (self-reported) PTSD (self-reported)	Emotion Thermometers (ET-5) (ET-5; Mitchell et al., 2010; Italian translation) The Children's Revised Impact of Event Scale (CRIES-13; Perrin et al., 2005)	None

on adults' mental health. However, this evaluation measured the impact of the intervention on teachers and students together, so it is not possible to make any conclusions about the intervention's effects on adults.

In addition to limitations already noted in relation to sample size and lack of diversity, study authors reported participant attrition [37], lack of follow up over time [34, 35], variations in the implementation of interventions across different study sites [26], and not assessing other potential sources of support that may have influenced the outcomes of an intervention [30]. Several studies reported not using randomised control groups [33–35, 36•, 37, 38] because of ethical concerns. Limitations of instruments used for measuring intervention effects included uncertainty about reliability of translated questionnaires [26, 28], challenges assessing complex concepts with multiple dimensions like resilience [33] and bias in clinical assessments [38]. Details on cost-effectiveness, inclusiveness, risk management strategies (e.g. mitigating risk of re-traumatisation) and implementation processes were also commonly missing from evaluation reports (see Appendix 3).

Discussion

This scoping review aimed to identify recent intervention and evaluation trials of post-disaster psychosocial programs for children and adolescents after disasters. The findings revealed studies conducted across five continents, following a wide range of types of natural disasters including major weather events, floods, volcano, pandemic and tsunami. They were delivered to different age groups, with schools being the most common setting for delivery, building on previous reviews of school-based programs [16, 17]. Unfortunately, it appears that the unique mental health needs of children in their preschool years continue to be overlooked [39].

Presenting the review findings within a stepped care framework in which universal interventions were allocated to level 1, targeted interventions to level 2 and treatment interventions to level 3, provided a useful means of differentiating the evidence. More of the recent studies of mental health interventions for children after disasters corresponded to level 1 interventions ($N=6$) with slightly less defined as level 2 ($N=4$) or level 3 ($N=3$). This may manifest a shift towards mental health promotion through community-based interventions, consistent with evidence showing that, after disasters, most children will show signs of resilience, and a few will develop more severe symptoms that require more specialized treatment [1, 3, 15]. While the evidence is building across each level of the stepped care approach, the strength of evidence is still limited due to considerable heterogeneity in intervention strategies, evaluation study design, timeframes and measures used [15]. Study limitations also included challenges achieving adequate sample sizes, participant attrition, lack of diversity, technological problems in online delivery, measurement challenges and lack of differentiation based on socioeconomic status. A meta-analysis identified by this review [24••] concluded that more research is needed on the influence of socioeconomic factors on the effectiveness of mental health interventions for children.

All the interventions were assessed in terms of their outcomes and impacts, and most included some sort of control or comparison group. The overall findings show positive program impacts on the mental health and wellbeing of the children and adolescent participants, consistent with previous reviews [14, 15, 17]. The literature reviews that aimed to compare the impact of level 3 interventions found that CBT was the most beneficial intervention for children [21, 22•, 23], followed by EMDR [22•, 23]. In terms of the factors influencing the impact of interventions, in their meta-analysis, Pfefferbaum and colleagues [24••] investigated a range of factors that might potentially influence treatment effectiveness and found that interventions that had significant effects on depression tended to be carried out in high-income countries and had more than eight sessions and interventions that were non-trauma focused.. Only non-trauma-focused interventions had a significant effect on anxiety symptoms. They noted however that the reliability of these findings was undermined to some extent by the heterogeneity of the studies and a lack of specific information provided about the interventions used.

The evidence on the negative impact of disasters on mental health shows that these effects can be long-lasting [1, 3]. More longitudinal studies are needed to assess the impact of interventions in the mid to long term. Intervention trials conducted with children and adolescents who have experienced multiple disasters are also increasingly important as the onset of climate change increases the likelihood of exposure to more frequent, more severe and more complex disaster scenarios [40]. In this review, most studies involved population groups exposed to a single major disaster event but importantly two of the studies were conducted with children who experienced repeat exposures to the same type of hazard [36•, 38] and one intervention involved students who experienced two different types of disasters—earthquake and tsunami [31], with positive outcomes. It is not clear in the Amin et al. report [27•] if the children and schools included in the study had repeated exposure to the floods or not. Lewey et al. [22•] in their review of EMDR and TF-CBT trials for children and adolescents found no significant differences in the effect sizes of studies for those with exposure to either single or mixed trauma type (chronic or repeated events).

The COVID-19 pandemic is reshaping mental health interventions for children after disasters, with new advances

in use of digital technology to teach children and developing telehealth interventions. This was reflected in this review which identified four interventions conducted online during the COVID-19 pandemic. An additional equity consideration for these interventions is the level of access that families have to digital devices and internet connection and provides an example of how local considerations can be important in shaping psychosocial interventions and evaluation of impacts. The importance of stakeholder input into disaster preparedness and recovery initiatives is enshrined in the Sendai Framework for Disaster Risk Reduction [41]. While standardised programs may be more easily replicated across large geographic areas with multiple locations, they can have the disadvantage of not adapting to local and individual resources and needs. Community involvement in intervention planning was a feature of one level 1 study [33] but most interventions were led by organizations from outside the community and the vast majority of the interventions had standardised content rather than tailoring them to different locations or individual children. One study demonstrated capacity to localise to a certain extent by engaging with local community to adapt the intervention to local languages in a level 2 intervention [27•] and another adjusted the treatment protocol to patients' symptoms in a level 3 intervention [36•]. Only one of the interventions in this review explicitly engaged children and youth in disaster recovery activities [33]. Involvement in disaster recovery planning and activities can be beneficial for young people [3] and this could have a positive influence on self-efficacy, one of the five essential elements of intervention following a mass trauma intervention [9]. Self-efficacy was explicitly addressed by only one of the interventions [28] and none of the other 5 essential elements were named by any of the interventions. However, we propose that each intervention's aims did align with at least one of the elements—calm, safety, connectedness, efficacy and hope. The most common aim was reducing PTSD, anxiety and depression symptoms, arguably a means of promoting a sense of calm and safety. Conversely, promoting hope and connectedness were the two elements that were addressed by the smallest number of interventions. All of the interventions addressing hope were level 1 [33, 35, 37] and those addressing connectedness were level 2 [27•, 29•] interventions. It may be helpful for future interventions to consider these elements in planning both intervention and evaluation components.

Conclusions

This scoping review contributes to the growing understanding of the contribution of psychosocial programs to child and adolescent recovery following exposure to natural disasters. Most importantly, it shows that positive impacts are being achieved across a range of programs, delivery modes and settings. Further studies are needed to confirm the findings because there are still a number of limitations to the evidence, not surprisingly given the complexity of post-trauma mental health needs and the disrupted context of post-disaster environments. Structuring the evidence according to a stepped care model provides a useful means of aligning the available evidence with recommended approaches. Similarly, Hobfoll et al.'s [9] nominated five essential elements for intervention following mass trauma, provide a guide for both intervention aims and assessment that is consistent with programs currently being delivered, if not explicitly stated. The most common focus across the interventions, and thus the developing evidence, was promotion of a sense of calm and safety. Unfortunately, current gaps in the evidence relate to potentially the most vulnerable of groups—preschool children, culturally and linguistically diverse groups, children and adolescents with disabilities, and socioeconomic disadvantage. This highlights future research priorities, as well as the need to build further understanding of programs that are feasible and effective in complex, multi-exposure disaster settings.

Appendix

Appendix 1 Interventions according to whether developers and deliverers belonged to the disaster-affected community, scale of the intervention, framework and fixed vs tailored contents

Level of intervention	Reference	Where was the intervention designed?	Who delivered the intervention? Were program deliverers local or external to the community?	Scale of the intervention	Framework	Fixed vs tailored contents
Level 1	Akiyama et al. [26]	Outside the country	Local teachers	School-wide (across 1 school)	The Mastery Approach to Coaching (MAC), based on goal orientation theory	Fixed
	Decosimo et al. [37]	Same country where the intervention was implemented	Local psychosocial workers and community members	Nation-wide, 40 sites	Art therapy, yoga therapy, play therapy, child development	Fixed
	Hasanudin et al. [28]	Outside the country	Researchers from the same country, but it was not mentioned if they belonged to the community	Information not provided	Therapeutic Group Therapy	Fixed
	Malboeuf-Hurtubise et al. [35]	Same country where the intervention was implemented	Undergraduate psychology students under the supervision of a clinician, it was not mentioned if they belonged to the community	1 classroom in an elementary school	Art therapy and mindfulness	Fixed
	Malbouef-Hurtubise et al. [34]	Same country where the intervention was implemented	Undergraduate psychology students under the supervision of a clinician, it was not mentioned if they belonged to the community	1 classroom in an elementary school	Philosophy for children (P4C) and mindfulness-based interventions (MBIs)	Fixed
	Osofsky et al. [33]	Same community where the intervention was implemented	Local teachers and mental health professionals	School-wide	Community-based and mental health approaches to stress reduction and self-awareness	Tailored to the community
Level 2	Amin et al. [27•]	Outside the country	External clinicians with local non-clinical staff	Regional (across 5 elementary public schools in three rural union councils)	Cognitive-Behavioural Intervention for Trauma in Schools	Fixed, but tailored to the local languages
	Ding and Yao [29•]	Same country where the intervention was implemented	Researchers from the same country, but it was not mentioned if they belonged to the community	Across 2 regions in China	Health education, evidence on the effects of exercise on physical and mental health	Fixed
	Yuan [30]	Information not provided	Local teachers	Information not provided	Mindfulness	Fixed
	Yustiana et al. [31]	Information not provided	One researcher from the same country where the intervention was delivered	Information not provided	Group play therapy	Information not provided
Level 3	Lee and Simpson [32]	Same country where the intervention was implemented	Clinicians from the Paediatric Emergency Department where the intervention was delivered	One Paediatric Emergency Department	Cognitive-behavioural therapy	Fixed
	Stasiak et al. [38]	Outside the country	The online intervention was implemented with minimal involvement from clinical and occupational therapists	City-wide	Cognitive-behavioural therapy	Fixed
	Trentini et al. [36•]	Outside the country	EMDR therapists working in pairs, who were from the same country or region where the intervention was implemented	Regional	EMDR-IGTP, based on the Standard EMDR Protocol with elements from group and art therapy	Fixed, but the protocol was adjusted to each patient's symptoms, stage of development and response to treatment

Appendix 2 Recipients of the interventions identified in this review

Level of intervention	Reference	Age of children who received the intervention	Was the intervention delivered individually or in groups?	Did children receive the intervention directly, or indirectly through training of teachers or caregivers?	Did the intervention include a component to support adults?
Level 1	Akiyama et al. [26]	10th grade students, mean age 16.6 years old	In groups	Directly	No
	Decosimo et al. [37]	4–18 years old	In groups	Directly	No
	Hasanudin et al. [28]	Information not provided	In groups	Directly	No
	Malboeuf-Hurtubise et al. [35]	4th to 5th grade, mean age 11.3 years old	In groups	Directly	No
	Malbouef-Hurtubise et al. [34]	Elementary school students, mean age 8–18 years old	In groups	Directly	No
	Osofsky et al. [33]	9 to 18 years old	In groups	Directly	No
Level 2	Amin et al. [27•]	7–13 years old, mean age of 11.43 years	In groups	Directly	Yes, support for parents
	Ding and Yao [29•]	12–18 years old	In groups	Directly	No
	Yuan [30]	12 to 14 years old	Individually	Directly	No
	Yustiana et al. [31]	Under 17 years old	In groups	Directly	Yes, support for teachers
Level 3	Lee and Simpson [32]	10 years old	Individually	Directly	Yes, support for parents
	Stasiak et al. [38]	Children aged 7–12 and adolescents aged 13–18 years old	Individually	Directly	Yes, support for parents
	Trentini et al. [36•]	Information not provided	In groups	Directly	No

Appendix 3 Studies according to whether they reported on the cost-effectiveness, accessibility and inclusion, risk management strategies, implementation and barriers of the intervention

Level of intervention	Reference	Cost-effectiveness	Accessibility & inclusion	Risk management strategies	Implementation	Barriers
Level 1	Akiyama, Gregorio, & Kobayashi, J. [26]	No	No	No	Yes, teachers kept a record of how many sessions were carried out at each school site	No
	Decosimo et al. [37]	No	No	No	No	No
	Hasanudin, Arief, Kurnia & Kusumaningrum [28]	No	No	No	No	No
	Malboeuf-Hurtubise et al. [35]	No	No	No	Yes, program fidelity was assessed through clinical supervision	No
	Malbouef-Hurtubise et al. [34]	No	No	No	Yes, program fidelity was assessed through clinical supervision	No
	Osofsky et al. [33]	No	Yes, the program was developed to be inclusive for children who had dropped out of school and/or were not used to leadership roles	No	No	No
Level 2	Amin et al. [27•]	No	Yes, based on feedback form the community, the intervention was adapted to Urdu, Punjabi and Siraiki	Yes, based on feedback from the community, the intervention was adapted to allow regular parental contact with deliverers	Yes, fidelity to the program was evaluated through clinical supervision, live observation and surveying co-facilitators	No
	Ding & Yao [29•]	No	No	No	No	No
	Yuan [30]	No	No	No	No	No
	Yustiana, Rusmana & Suryana [31]	No	No	No	No	No
Level 3	Lee & Simpson [32]	No	No	No	No	No
	Stasiak, Merry, Frampton & Moor [38]	No	No, two participants had to be excluded because they had a disability	Yes, after an initial screening, potential participants showing moderate to severe levels of depression or anxiety were referred to an appropriate treatment provided by local services	Yes, researchers assessed the number of sessions completed by children and parents and asked for their feedback	Yes
	Trentini [36•]	No	No	No	No	No

Compliance with Ethical Standards

Conflict of Interest Authors Jane Nursey and Sean Cowlishaw are employed by Phoenix Australia: Centre for Posttraumatic Mental Health, the organisation responsible for two resources mentioned in the introduction to this article: (1) Australian and International Guidelines for the Treatment of Acute Stress Disorder and Posttraumatic Stress Disorder, advocating a stepped care approach; (2) trialling of the SOLAR program in Australia. Lisa Gibbs also contributed to the original development of SOLAR. The remaining authors declare that they have no conflict of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

References

Papers of particular interest, published recently, have been highlighted as:
• Of importance
•• Of major importance

1. Bonanno G, Brewin C, Kaniasty K, La Greca A. Weighing the costs of disaster: consequences, risks, and resilience in individuals, families, and communities. Psychol Sci Public Interes. 2010;11(1):1–49.
2. Beaglehole B, Mulder R, Frampton C, Boden J, Newton-Howes G, Bell C. Psychological distress and psychiatric disorder after natural disasters: systematic review and meta-analysis. 213: . Br J Psychiatry. 2018;213:716–722.
3. Peek L. Children and disasters: understanding vulnerability, developing capacities, and promoting resilience - an introduction. Child Youth Environ. 2008;18(1):1–29.
4. Norris F, Friedman M, Watson P. 60,000 disaster victims speak: part II. Summary and implications of the disaster mental health research. Psychiatry. 2002;65(3):240–60.
5. Ramos G, Scarpetta S. Combatting COVID-19's effect on children. Tackling Coronavirus (COVID-19): Contributing to a Global Effort. 2020.
6. Fore HH. A wake-up call: COVID-19 and its impact on children's health and wellbeing. Lancet. 2020;8:e861–2.
7. Phoenix Australia - centre for postraumatic mental health. Australian guidelines for the prevention and treatment of acute stress disorder, posttraumatic stress disorder and complex posttraumatic stress disorder. Melbourne. 2020.
8. Cohen GH, Tamrakar S, Lowe S, Sampson L, Ettman C, Linas B, et al. Comparison of simulated treatment and cost-effectiveness of a stepped care case-finding intervention vs usual care for posttraumatic stress disorder after a natural disaster. JAMA Psychiat. 2017;74(12):1251–8.
9. Hobfoll S, Watson P, Bell C, Bryant R, Brymer M, Friedman M, et al. Five essential elements of immediate and mid-term mass trauma intervention: empirical evidence. Psychiatry. 2007;70:283–315.
10. Brymer MJ, Taylor M, Escudero P, Jacobs A, Kronenberg M, Macy R, et al. Psychological first aid: field operations guide 2nd edition [Internet]. Los Angeles, CA; 2012. Available from: http://www.nctsn.org/content/psychological-first-aid-schoolspfa
11. Zoellner, LA, Graham, B, Bedard-Gilligan, MA. Trauma- and stressor-related disorders. In Psychopathology: Foundations for a contemporary understanding, 4th Edition; Routledge; New York; 2016;162–81.
12. Berkowitz S, Bryant R, Brymer M, Hamblen J, Jacobs A, Layne C, et al. National center for PTSD and national child traumatic stress Network, Skills for Psychological Recovery: Field Operations Guide. 2010.
13. O'Donnell ML, Lau W, Fredrickson J, Gibson K, Bryant RA, Bisson J, et al. An open label pilot study of a brief psychosocial intervention for disaster and trauma survivors [Internet]. Vol. 11, Frontiers in Psychiatry. 2020. p. 483. https://doi.org/10.3389/fpsyt.2020.00483
14. Newman E, Pfefferbaum B, Kirlic N, Tett R, Nelson S, Liles B. Meta-analytic review of psychological interventions for children survivors of natural and man-made disasters. Curr Psychiatry Rep. 2014;16(9):462.
15. Brown RC, Witt A, Fegert JM, Keller F, Rassenhofer M, Plener PL, et al. Psychosocial interventions for children and adolescents after man-made and natural disasters: a meta-analysis and systematic review. Psychological Medicine 47: Psychol Med [Internet]. 2017;47(11):1893–905. https://doi.org/10.1017/S0033291717000496
16. Fu C, Underwood C. Meta-review of school-based disaster interventions for child and adolescent survivors. J Child Adolesc Ment Heal. 2015;27(3):161–71.
17. Rolfsnes E, Idsoe T. School-based intervention programs for PTSD symptoms: a review and meta-analysis. J Trauma Stress. 2011;224(2):155–65.
18. Shultz J, Forbes D. Psychological first aid. Disaster Heal. 2014;2(1):3–12.
19. Wang L, Norman I, Xiao T, Li Y, Leamy M. Psychological first aid training: a scoping review of its application, outcomes and implementation. Int J Environ Res Public Health. 2021;18:4594.
20. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. Int J Soc Res Methodol. 2005;8(1):19–32.
21. Galvan MS, Lueke AE, Mansfield L, Smith CA. A systematic research review: how to best treat post-traumatic stress disorder in children post-natural disaster. J Hum Behav Soc Environ [Internet]. 2020; https://doi.org/10.1080/10911359.2020.1804513
22.• Lewey JH, Smith CL, Burcham B, Saunders NL, Elfallal D, O'Toole SK. Comparing the effectiveness of EMDR and TF-CBT for children and adolescents: a meta-analysis. J Child Adolesc Trauma [Internet]. 2018;11(4):457–72. https://doi.org/10.1080/10911359.2020.1804513. **This meta-analysis examined differences in effect sizes for those exposed to either single or mixed trauma.**
23. Mavranezouli I, Megnin-Viggars O, Daly C, Dias S, Stockton S, Meiser-Stedman R, et al. Psychological and psychosocial treatments for children and young people with post-traumatic stress disorder: a network meta-analysis. J Child Psychol Psychiatry. 2020;61(1):18–29.
24.•• Pfefferbaum B, Nitiema P, Newman B. A meta-analysis of intervention effects on depression and/or anxiety in youth exposed to political violence or natural disasters. Child Youth Care Forum

[Internet]. 2019;48(4):449–77. https://doi.org/10.1007/s10566-019-09494-9. **This meta-analysis examined a range of factors that potentially influence treatment effectiveness.**

25. Boldt K, Coenen M, Movsisyan A, Voss S, Rehfuess E, Kunzler AM, et al. Interventions to ameliorate the psychosocial effects of the COVID-19 pandemic on children - a systematic review. Int J Environ Res Public Health [Internet]. 2021;18(5):1–31. https://doi.org/10.3390/ijerph18052361.
26. Akiyama T, Gregorio ER, Kobayashi J. Youth sports activity and young people's well-being after a disaster: a trial with the Mastery Approach to Coaching (MAC) in the Philippines. BMC Res Notes. 2018;11(747):(22 October 2018).
27.• Amin R, Nadeem E, Iqbal K, Asadullah MA, Hussain B. Support for students exposed to trauma (SSET) program: an approach for building resilience and social support among flood-impacted children. School Ment Health [Internet]. 2020;12(3):493–506. https://doi.org/10.1007/s12310-020-09373-y. **This small randomised experimental trial of a level 2 intervention demonstrated it is possible to work with the local community to adapt the intervention to local language and context.**
28. Hasanudin H, Arief YS, Kurnia ID, Kusumaningrum T. Therapeutic group can increase resilience of school-age children after the Kelud mountain disaster. EurAsian J Biosci [Internet]. 2020;14(1):2443–7.
29.• Ding X, Yao J. Peer education intervention on adolescents' anxiety, depression, and sleep disorder during the COVID-19 Pandemic. Psychiatr Danub [Internet]. 2020;32(3–4):527–35. https://doi.org/10.24869/psyd.2020.527.10.24869/psyd.2020.527. **This randomised experimental trial of a level 2 intervention was one of only two seeking to promote connectedness through peer social support the other was reference 27.**
30. Yuan Y. Mindfulness training on the resilience of adolescents under the COVID-19 epidemic: a latent growth curve analysis. Pers Individ Dif. 2021;172:110560.
31. Yustiana Y, Rusmana N, Suryana D. Group play therapy for the treatment of post-traumatic stress disorder in child victim of Tsunami in Banten Province. Elem Educ Online [Internet]. 2020;19(4):2140–8. https://doi.org/10.17051/ilkonline.2020.763702.
32. Lee D, Simpson S. A three-step, single session therapy intervention for COVID-related anxiety in a pediatric emergency department. Cureus. 2020;12(12):e12371.
33.•• Osofsky H, Osofsky J, Hansel T, Lawrason B, Speier A. Building resilience after disasters through the youth leadership program: the importance of community and academic partnerships on youth outcomes. Prog Community Heal Partnerships Res Educ Action [Internet]. 2018;12(Special Issue):11–21. https://doi.org/10.1353/cpr.2018.0017. **This quasi-experimental study, incorporating a longitudinal analysis, engaged stakeholders in shaping the intervention and included youth in disaster recovery activities.**
34. Malboeuf-Hurtubise C, Léger-Goodes T, Mageau G, Joussemet M, Herba C, Chadi N, et al. Philosophy for children and mindfulness during COVID-19: results from a randomized cluster trial and impact on mental health in elementary school students. Prog Neuropsychopharmacol Biol Psychiatry [Internet]. 2021;107:110260. https://doi.org/10.1016/j.pnpbp.2021.110260.
35. Malboeuf-Hurtubise C, Leger-Goodes T, Mageau G, Taylor G, Herba C, Chadi N, et al. Online art therapy in elementary schools during COVID-19: results from a randomized cluster pilot and feasibility study and impact on mental health. Child Adolesc Psychiatry Ment Health [Internet]. 2021;15(1):15. https://doi.org/10.1186/s13034-021-00367-5.
36.• Trentini C, Lauriola M, Giuliani A, Maslovaric G, Tambelli R, Fernandez I, et al. Dealing with the aftermath of mass disasters: a field study on the application of EMDR integrative group treatment protocol with child survivors of the 2016 Italy earthquakes. Front Psychol [Internet]. 2018;4(9):862. https://doi.org/10.3389/fpsyg.2018.00862.
37. Decosimo C, Hanson J, Quinn M, Badu P, Smith C. Playing to live: outcome evaluation of a community-based psychosocial expressive arts program for children during the Liberian Ebola epidemic. Glob Ment Heal [Internet]. 2019;6: e3. https://doi.org/10.1017/gmh.2019.1.
38. Stasiak K, Merry S, Frampton C, Moor S. Delivering solid treatments on shaky ground: feasibility study of an online therapy for child anxiety in the aftermath of a natural disaster. Psychother Res [Internet]. 2018;28(4):643–53. https://doi.org/10.1017/gmh.2019.1.
39. Gibbs L, Snowdon E, Block K, Gallagher HC, MacDougall C, Ireton G, et al. Where do we start? A proposed post disaster intervention framework for children and young people. Pastor Care Educ. 2014;32(1):68–87. https://doi.org/10.1080/02643944.2014.881908
40. IPCC. Global Warming of 1.5 °C. An IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change. In press; 2018.
41. United Nations. Sendai framework for disaster risk reduction 2015–2030 [Internet]. Sendai, Japan; 2015. Available from: https://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf