

BMJ Open Strategies to mitigate the impact of the COVID-19 pandemic on child and youth well-being: a scoping review protocol

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ABSTRACT

Introduction Children and youth are often more vulnerable than adults to emotional impacts of trauma. Wide-ranging negative effects (eg, social isolation, lack of physical activity) of the COVID-19 pandemic on children and youth are well established. This scoping review will identify, describe and categorise strategies taken to mitigate potentially deleterious impacts of the COVID-19 pandemic on children, youth and their families.

Methods and analysis We will conduct a scoping review following the Arksey-O'Malley five-stage scoping review method and the Scoping Review Methods Manual by the Joanna Briggs Institute. Well-being will be operationalised according to pre-established domains (health and nutrition, connectedness, safety and support, learning and competence, and agency and resilience). Articles in all languages for this review will be identified in CINAHL, Cochrane CENTRAL Register of Controlled Trials, EMBASE, ERIC, Education Research Complete, MEDLINE and APA PsycINFO. The search strategy will be restricted to articles published on or after 1 December 2019. We will include primary empirical and non-empirical methodologies, excluding protocols, reports, opinions and editorials, to identify new data for a broad range of strategies to mitigate potentially deleterious impacts of the COVID-19 pandemic on child and youth well-being. Two reviewers will calibrate screening criteria and the data abstraction form and will independently screen records and abstract data. Data synthesis will be performed according to the convergent integrated approach described by the Joanna Briggs Institute.

Ethics and dissemination Ethical approval is not applicable as this review will be conducted on published data. Findings of this study will be disseminated at national and international conferences and will inform our pan-Canadian multidisciplinary team of researchers, public, health professionals and knowledge users to codesign and pilot test a digital psychoeducational health tool—an interactive, web-based tool to help Canadian youth and their families address poor mental well-being resulting from and persisting beyond the COVID-19 pandemic.

INTRODUCTION

In March 2020, the WHO declared the novel SARS-CoV-2 (COVID-19) disease outbreak

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ We will conduct a comprehensive literature search of multiple bibliographic databases for literature on broad domains of child and youth well-being.
- ⇒ Our scoping review will follow the Arksey-O'Malley five-stage scoping review method and will conform to the manual from the Joanna Briggs Institute.
- ⇒ We will include all primary empirical and non-empirical record types that report novel data on the broad range of strategies taken to mitigate potentially deleterious impacts of the COVID-19 pandemic on children and/or youth, and their families if included.
- ⇒ We anticipate extensive data searches given the rapid and continuous nature of COVID-19 literature.
- ⇒ We foresee challenges related to accurately outlining the steps for completion and categorising by type the strategies based on what is briefly reported in the published literature.

a global pandemic.¹ National governments around the world in consultation with public health officials have engaged in concentrated efforts to protect the public from viral transmission that included widespread closures of public institutions, implementation of mandatory masking and capacity policies, execution of travel restrictions and 'stay at home' orders.² From previous public health crises we have learnt that children and youth are often more vulnerable in comparison to adults to the emotional impact of traumatic events (including illnesses) that disturb daily routines and affect one's sense of security.³ The far-reaching negative impacts of the COVID-19 pandemic on children and youth (eg, declines in social, mental and/or physical health) have been well established,⁴⁻⁸ whereas the associated solutions have been markedly understudied.⁹ This is a critical gap in our global COVID-19 response effort.

The COVID-19 pandemic and associated public health restrictions have taken a devastating toll on youth.⁴ Social isolation resulting from these measures, combined with reduced access to support services within schools and communities and fewer opportunities to engage in protective activities such as physical activity, is likely to have detrimental short-term and long-term effects on youth mental well-being.¹⁰ This is particularly evident among youth with pre-existing vulnerabilities such as exposure to familial adversity.¹¹ Thus, there is a pressing need to partner with youth and their families to target and improve youth well-being prior to the onset of mental or physical health disorders, as well as to conduct research on youth mental well-being needs related to pandemic recovery. The first step is to understand the broad range of strategies (eg, digital tools for mental health) that have been taken to mitigate potentially deleterious impacts of the COVID-19 pandemic (eg, loneliness, isolation, illness) on the well-being of children, youth and their families, and subsequently translating findings into actionable interventions to support recovery and resilience.

We report a protocol for a scoping review designed to identify, describe and categorise any strategy taken during the COVID-19 pandemic to address the impact of the COVID-19 pandemic on child and youth well-being (including their families if data are presented). For the purposes of this review, optimal well-being (including the domains of health and nutrition, connectedness, safety and support, learning and competence, and agency and resilience¹²) is defined as when ‘children and youth have the support, confidence, and resources to thrive in contexts of secure and healthy relationships, realizing their full potential and rights’.¹² The results of our scoping review will directly inform integrated knowledge translation interventions at the individual, family unit and health and education system levels, to close the most important gaps in recovery from pandemic events facing children, youth and families.

REVIEW QUESTIONS

This scoping review will be conducted as per the Arksey-O’Malley five-stage scoping review method¹³ and the Scoping Review Methods Manual by the Joanna Briggs Institute.¹⁴ The Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) guideline was used to develop the protocol.¹⁵ We will adhere to the PRISMA extension for Scoping Reviews (PRISMA-ScR) to report the findings from the completed scoping review.¹⁶

The primary research question underpinning this scoping review is: What strategies have been taken to mitigate potentially deleterious impacts of the COVID-19 pandemic on child and youth well-being?

The components of population, exposure, comparator, outcome, study design and timeframe are as follows:

- ▶ **Population:** Children or youth (≤ 18 years, who may or may not have been infected with COVID-19

previously) and their (immediate and extended) families (if presented).

- ▶ **Exposure:** Any strategies (ie, interventions) including clinical, social, policy or political (specific to children and youth) that have been taken to mitigate potentially deleterious impacts (eg, psychological, physical) of the COVID-19 pandemic.
- ▶ **Comparator:** Any or no comparator will be accepted.
- ▶ **Outcomes:** Any well-being outcome that will be operationalised according to pre-established domains (health and nutrition, connectedness, safety and support, learning and competence, and agency and resilience).¹²
- ▶ **Study design:** Any empirical or non-empirical study, excluding protocols, reviews, commentaries, editorials, opinions, case studies and case reports, book chapters and dissertations. We will exclude publications in preprint.
- ▶ **Timeframe:** Publications from 1 December 2019 to present.

METHODS AND ANALYSIS

Study design eligible

We will include any published article that reports new (ie, not previously published) findings including primary observational studies (eg, cross-sectional (surveys), cohort, case-control studies), qualitative research or interventional studies (eg, randomised controlled trials, non-randomised controlled trials). We will include strategy development as well as implementation-related studies. We will exclude dissertations, reviews, commentaries, editorials, opinions, case studies and case reports, as well as articles in preprint repositories (table 1).

Participant eligibility

Eligible study populations will include children and youth (hereafter referred to as *youth* and age defined as ≤ 18 years,¹⁷ capturing the portion of children and youth in adolescence and emerging independence). Eligible studies do not need to include immediate (ie, nuclear) or extended (ie, relative) adult family members (>18 years of age, or as defined in the individual study), though these studies will be included if other population criteria are met. If results for child/youth-family dyads are reported in separate publications, we will include both studies. We will include both COVID-positive, COVID-negative and unknown COVID status children, youth and family members, and outcomes of these groups will be stratified by COVID-19 status if reported. We will include studies that report on strategies that are or are not mediated by another individual (or group) in addition to the youth (or parent/guardian) (eg, mental well-being approaches that are mediated through psychologists or occupational therapists, social well-being approaches that are mediated through schoolteachers).¹⁸ This research builds on our funded national programme of pandemic preparedness research to examine the knowledge, perceptions, behaviours and associated impact of the pandemic and

Table 1 Inclusion and exclusion criteria for a scoping review investigating strategies to mitigate potentially deleterious impacts of the COVID-19 pandemic on child and youth well-being

Inclusion	Exclusion
Any observational or interventional primary research study, including focus groups and qualitative inquiries.	The study is a study protocol, review, commentary, editorial, opinion, case study and case report, or report from an expert advisory group.
The study's population includes children or youth aged ≤18 years.	The study's population does not include children or youth aged ≤18 years.
The study reports on a strategy (ie, intervention) to mitigate potentially deleterious impacts of the COVID-19 pandemic.	The study does not report on a strategy (ie, intervention) to mitigate potentially deleterious impacts of the COVID-19 pandemic.
The study outcome(s) are any well-being outcome that will be operationalised according to pre-established domains (health and nutrition, connectedness, safety and support, learning and competence, and agency and resilience).	The study outcome(s) are not any well-being outcome that will be operationalised according to pre-established domains (health and nutrition, connectedness, safety and support, learning and competence, and agency and resilience).
The study was started on or after 1 December 2019.	The study was started before 1 December 2019.
The study presents unique data which have not been previously published, or is the most recent and comprehensive analysis of the data.	The study which includes duplicate data from an earlier published study.

related restrictions on the Canadian public (aged 10 and older) to develop evidence-informed solutions to enhance pandemic recovery.

Exposure eligibility

The exposure is any strategies (ie, interventions) that have been taken to mitigate potentially deleterious impacts of the COVID-19 pandemic on children and youth well-being. To manage the amount of literature retrieved, we will only include strategies that are specific to children and youth.

Outcome measure eligibility

The primary outcome is any well-being assessment that will be operationalised according to pre-established domains (health and nutrition, connectedness, safety and support, learning and competence, and agency and resilience).¹² All eligible studies will describe a strategy with quantitative and/or qualitative (perspectives (ie, views or prospects) or experiences (ie, encounters)) results. As we expect outcome measures to vary and use different measurement tools, we will not prespecify principal summary measures. We will not combine included studies in meta-analyses given our desire to understand

strategies and the association with well-being outcomes and to interpret any potential variation.

Timeframe eligibility

Eligible studies will be publications from 1 December 2019 to present. Search results will be updated prior to manuscript submission.

Search strategy

Articles in all languages for this review will be identified in CINAHL, Cochrane CENTRAL Register of Controlled Trials, EMBASE, ERIC, Education Research Complete, MEDLINE and APA PsycINFO. The search strategies were developed by a librarian coinvestigator in collaboration with other members of the team.¹⁹ A range of broad search terms will be used to maximise the yield of the search for studies. Search terms were selected based on the components of child and youth well-being during the COVID-19 pandemic, and strategies, solutions, tools and interventions. The full search strategy for all databases can be found in online supplemental appendix 1.

Study selection

At the title and abstract screening stage, a subset of the team (SJMo, SJMi) will achieve 100% agreement on a calibration exercise of 50 random citations prior to commencing selection of eligible studies. After reliability in reference screening is ensured, two reviewers (SJMo, SJMi) will use Covidence to independently screen titles and abstracts in duplicate for potential inclusion using screening questions developed for this review (table 2). Any study selected by any reviewer at this stage will progress to the next stage. After initial screening, two authors (SJMo, SJMi) will examine full texts independently and in duplicate for eligibility and for development of the final data abstraction table. A separate calibration exercise will be then performed for screening reference lists of selected articles. (eg, literature reviews or summary reports on this topic). Two independent authors (SJMo, SJMi) will screen reference lists of selected articles in duplicate to identify additional relevant articles for potential study selection; original articles will be sourced, and the full text assessed for eligibility. Disagreements in study selection at the full-text stage will be resolved by a third reviewer (MCA).

Data abstraction

Data abstraction will be conducted by the same authors who performed the screening and full-text review (SJMo, SJMi), and will include study identifiers and study design, participants, exposure information (including detailed information on strategies taken to mitigate impact), outcome information (any assessments for the pre-established well-being domains) and author conclusions and recommendations (table 3). Approaches or strategies to mitigate the impact of the COVID-19 pandemic will be summarised quantitatively, as well as qualitatively, in thematic analysis, for which the process is described below.

**Table 2** Screening questions to identify literature for inclusion in a scoping review investigating strategies to mitigate potentially deleterious impacts of the COVID-19 pandemic on child and youth well-being

Screening domain and question	Characteristics for assessment		
	Yes—include	No—exclude	Unclear—include
<i>Title and abstract screening questions to be used to identify literature to be included in the full-text screening process</i>			
<i>Study design:</i> Does the title/abstract describe an observational or interventional primary research study, including focus groups and qualitative inquiries?	Yes: The study employs an observational or interventional primary research design, including focus groups and qualitative inquiries.	No: The study is a protocol, review, commentary, editorial, opinion, case study, case report, thesis, preprint or a report from an expert advisory group.	Unclear: It is unclear if the study employs an observational or interventional primary research design, including focus groups and qualitative inquiries.
<i>Publication type:</i> Does the title and abstract come from a published study?	Yes: The study is a published study.	No: The study is not a published study.	Unclear: It is unclear if the study is a published study.
<i>Population:</i> Does the population of interest include children or youth aged 18 years or under?	Yes: The study population describes children or youth aged 18 years or under.	No: The population of interest does not include children or youth aged 18 years or under.	Unclear: It is unclear if the population of interest includes children or youth aged 18 years or under.
<i>Exposure:</i> Is the study's exposure of interest any strategy implemented to mitigate potentially deleterious impacts of the COVID-19 pandemic on children or youth?	Yes: The exposure of interest includes any strategy implemented to mitigate potentially deleterious impacts of the COVID-19 pandemic on children or youth.	No: The exposure of interest does not include any strategy implemented to mitigate potentially deleterious impacts of the COVID-19 pandemic on children or youth.	Unclear: It is unclear if the exposure of interest includes any strategy implemented to mitigate potentially deleterious impacts of the COVID-19 pandemic on children or youth.
<i>Outcome:</i> Does the title or abstract report on any well-being outcome(s) operationalised according to pre-established domains (health and nutrition, connectedness, safety and support, learning and competence, and agency and resilience)?	Yes: One or more of the outcomes in the study are any well-being outcomes operationalised according to pre-established domains (health and nutrition, connectedness, safety and support, learning and competence, and agency and resilience).	No: There is no outcome in the study related to any of well-being outcomes operationalised according to pre-established domains (health and nutrition, connectedness, safety and support, learning and competence, and agency and resilience).	Unclear: It is unclear from the title and abstract if the outcome of interest is related to any of well-being outcomes operationalised according to pre-established domains (health and nutrition, connectedness, safety and support, learning and competence, and agency and resilience).
Characteristics for assessment			
Screening domain and question	Yes—include	No—exclude	
<i>Full article screening questions to be used to identify literature for inclusion in the systematic review</i>			
<i>Timeframe:</i> Was the strategy enacted on or after 1 December 2019?	Yes: The strategy was enacted on or after 1 December 2019.	No: The strategy was enacted before 1 December 2019.	
<i>Setting:</i> Was the setting where the strategy was enacted outside of an acute care setting?	Yes: The setting where the strategy was enacted is not an acute care setting.	No: The setting where the strategy was enacted is an acute care setting.	
Full article screening questions include all screening domains and questions from title and abstract screening and two additional domains.			

A data abstraction form will be created in Microsoft Excel. The abstraction form will be piloted and tested by the data abstractors (SJM_o, SJM_i) on a subset of studies (ie, 5% of studies if n>50, 10% of studies if n≤50) to ensure clarity. Following pilot testing, the form will be adapted as recommended by the abstractors to improve usability and completeness. The first author (SJM_o) and one additional abstractor (SJM_i) will complete data extraction for all included records. Data abstraction

will be completed independently; the first author will complete data abstraction for all included studies, and the additional abstractor will check and verify the abstracted data for accuracy. Disagreements will be resolved by a third reviewer (MCA). If data presented in a study are unclear, missing or presented in a format that is unusable or cannot be abstracted, we will attempt to contact the corresponding authors for clarification. We will contact authors via email, and a follow-up email will be sent 2

Table 3 Data to be abstracted from eligible studies included in the review*

Data domain	Data categories
<i>Study identifiers:</i> from a published study	Author names; study title; publication type; publication date; journal, volume, issue and page numbers of publication; place of publication (ie, first author's institutional email address); digital object identifier
<i>Study design:</i> primary research	Study type or design; timeframe of study; location of study (ie, country); region of study (localised when reported)
<i>Participants:</i> children and youth and (if reported) their family member or guardians	Definition and size (ie, n) of the source population(s) at risk; relevant demographic information (eg, age, sex, gender, ethnicity, grade in school, type of school, relationship to guardian if not parent)
<i>Exposure:</i> any strategy implemented to mitigate potentially deleterious impacts of the COVID-19 pandemic on children or youth	Strategy type, duration (if applicable), location (ie, geographical); steps or guiding principles to conduct the strategy (eg, elements or a stepwise protocol); derivation of the strategy from empirical evidence (ie, if derived from observation and experiment, or published theory); minimum expertise to conduct the strategy (ie, whether additional personnel are required (eg, social worker, psychiatrist)); limitations to the strategy (eg, requirement of stable WiFi connection or personal device); reproducibility of the strategy (ie, operationalised, evidenced by use in multiple settings); feasibility of the strategy to other contexts (ie, generalisable, considering if internal validity should precede external validity)
<i>Outcome:</i> well-being outcomes operationalised according to pre-established domains (health and nutrition, connectedness, safety and support, learning and competence, and agency and resilience)	Child, youth or parent/guardian COVID-19 status; assessment tool(s); timepoint of assessment(s); assessment estimate and measure of variance (eg, standard deviation, IQR); statistical significance; authors' conclusions and recommendations; themes and subthemes including exemplary quotations from studies reporting qualitative findings

*Data will be categorised according to the 'Inform, Activate, Collaborate Framework' developed by our team.

weeks later. We will allocate a 4-week period to receive responses from authors beginning from the time of the initial contact attempt. Thereafter, we will document missing data in the review.

Data synthesis

Data synthesis will be performed according to the convergent integrated approach as described by the Joanna Briggs Institute. This process includes combining abstracted data from quantitative studies with the

abstracted data from qualitative studies through data transformation; quantitative data will be 'qualitized', as codifying quantitative data is less error prone than attributing numerical values to qualitative data. 'Qualitizing' will also involve a narrative interpretation of the quantitative results, creating textual descriptions to allow integration with qualitative data.²⁰ These textual descriptions will be assembled and pooled with qualitative data, extracted directly from the included qualitative studies. Categories of pooled data will be aggregated to produce the overall findings of the review.

Presentation of the results

The final search strategy for each database and all ancillary searches conducted will be provided as an appendix in the final publication. A flow chart, following the PRISMA-ScR,¹⁶ will illustrate where citations were eliminated during screening and ancillary searches, including rationale for exclusion in full-text screening. All included studies will be presented in a narrative synthesis. A table of characteristics of included studies will be included in the published journal article and will describe study identifiers and period of study, sample and setting, strategy, direction and magnitude of the outcome, and authors' conclusions and recommendations. Descriptive statistics will be provided as extensions of this table when appropriate or in the narrative synthesis. Results from our convergent integrated approach to data synthesis will be presented as a separate table and summarised narratively in the results.

We will use the 'Inform, Activate, Collaborate Framework' developed by our team²¹ to categorise the strategies that we identify in our review to present a catalogue of strategies with the ultimate goals to: (1) inform the global community of pandemic policies and stressors most impacting youth and families; (2) activate progressive youth and family participation for increased understanding and promotion of positive behaviours to well-being; and (3) foster collaboration between community members, educators, researchers, youth and family organisations, decision makers and health professionals in regard to pandemic policies and their impact on youth and family well-being. Well-being outcome measures will be categorised according to the framework for child and youth well-being, including the domains of health, connectedness, safety, learning and agency.¹²

Patient and public involvement

Youth-engaged research gives us the opportunity to learn from youth about how social systems—like families, schools and communities—and systemic inequities impact their experiences and outcomes.²² The proposed review will abide by the Canadian Institutes of Health Research (CIHR)-guiding core principles of inclusiveness, mutual respect, support and cobuilding.²³ We will adhere to the Guidance for Reporting Involvement of Patients and the Public (GRIPP)-2 reporting guidelines for patient and public involvement.²⁴ Youth involvement

Table 4 Anticipated deliverables from the scoping review

Deliverables	Audience	Methods
Framework of potential strategies according to the domain of well-being and level of engagement required	Youth, family members, healthcare providers, researchers, advocacy councils and policy makers	Publish in relevant journals; disseminate at relevant academic meetings; presentation at grand rounds.
A bibliography of articles that describe how to conduct strategies to mitigate impact	Youth, family members, healthcare providers, researchers, advocacy councils, policy makers and funders	Prepare a summary report outlining possible approaches to mitigate potential impacts that will include the primary articles, to be made available as a PowerPoint slide deck; non-traditional strategies to disseminate our results (eg, social media, blogs).
An in-depth synthesis and comparison of results and insights on strategies, including categorisation of methods used to assess each strategy, to reveal what research is available for each strategy	Youth, family members, healthcare providers, researchers, youth advocacy councils and policy makers	Inform a sequential explanatory mixed-methods design that involves three intersecting phases of work anchored conceptually to the five domains of youth well-being. We have partnered with the O'Brien Institute for Public Health, The Sandbox Project, KT Canada, Children's Healthcare Canada, Young Canadians Roundtable on Health, Solutions for Kids in Pain, 19 to Zero, and Maritime and Alberta SPOR Support Units for implementation.

(herein referred to as knowledge users) was considered in priority setting discussions and group consultations. These knowledge users (SS, MH) were involved in protocol development and will continue to be involved in the project through to and including dissemination of the published report and implementation of the evidence-informed recommendations. Our multidisciplinary team of knowledge users, researchers and healthcare providers (eg, physician, psychologist) have established a track record of coleading national peer-reviewed grants and research success in publishing with knowledge users.^{25 26}

Knowledge translation plan

We will use an integrated knowledge translation approach through the inclusion of knowledge users (ie, youth and family members, and multidisciplinary healthcare providers). The underpinning knowledge translation framework for this work will be Graham's knowledge-to-action framework.²⁷ We will disseminate and deliver the products of this review (table 4) to different stakeholder groups using the 'Inform, Activate, Collaborate Framework' developed by our team²¹ for continuity with knowledge users and stakeholder groups. This will allow the opportunity to elicit generalisable findings that can directly inform practice and policy decisions related to youth during COVID-19, and for future pandemics.

ETHICS AND DISSEMINATION

Ethical approval is not applicable as this review will be conducted on published data only. Findings of this study will be disseminated at national and international conferences and will inform our pan-Canadian multidisciplinary team of researchers, public (youth and family partners), health professionals and knowledge users (healthcare and non-governmental organisation decision makers) to codesign and pilot test a digital psychoeducational health tool—an interactive, web-based tool to help Canadian youth and their families address poor mental well-being

resulting from and persisting beyond the COVID-19 pandemic.

DISCUSSION

Children, youth and families globally have been under significant increased stress and strain during the COVID-19 pandemic. The effects on the mental, physical and social health of youth have been particularly detrimental.⁵⁻⁷ The proposed scoping review has the potential to enhance recovery efforts following the COVID-19 pandemic and will make contributions for future pandemic care responses and preparedness planning. Using the convergent integrated approach to data synthesis for mixed-methods systematic reviews, as described by the Joanna Briggs Institute,²⁸ our results will rapidly provide evidence to inform the development of adaptable youth interventions, related policies and decision-making at both government and organisational levels during the current and future public health crises.

There is presently no comprehensive synthesis of available research on strategies to mitigate potentially deleterious impacts of the COVID-19 pandemic on youth and their families. To develop this synthesis, a bibliography of strategies and associated outcomes is needed. We aim to develop a catalogue of strategies according to the five domains of youth well-being,¹² as well as the level of engagement (ie, inform, activate, collaborate) necessary for the strategy to have a desirable effect. This catalogue will provide a systematic process for policy makers to make informed decisions about which strategy is the most appropriate to address and mitigate potentially negative impacts from the COVID-19 pandemic, which will directly inform practice and policy decisions.

Our work will help identify gaps in the literature where primary evidence is needed. We anticipate that this scoping review will lead to several subsequent systematic reviews. For example, one future systematic review

may focus on mental health interventions to increase youth connectedness. We also expect that this review may inform future studies on effective well-being interventions and psychological strategies for youth and their families impacted by COVID-19, which will enhance the extent and quality of the research evidence base.

Finally, this review will directly inform a sequential explanatory mixed-methods design²⁹ study that involves three intersecting phases of work anchored conceptually to the five domains of youth well-being, as our pan-Canadian multidisciplinary team of researchers, public (youth and family partners), health professionals and knowledge users (healthcare and non-governmental organisation decision makers) who will codesign and pilot test a digital psychoeducational health tool—an interactive, web-based tool to help Canadian youth and their families address poor mental well-being resulting from and persisting beyond the COVID-19 pandemic. The overarching goal of our work is to partner with youth and families by engaging around pandemic experiences and recovery needs, educating on best available resources and empowering involvement in the development of targeted resources that support recovery and resilience.

Anticipated challenges

The potential benefits of this scoping review must be studied considering possible challenges. We foresee that the yield of the literature searches might be extensive, given the rapid and continuous nature of the publication of COVID-19 research in journals. We also anticipate challenges related to outlining strategies accurately based on the published record. However, we have a strong and diverse team that has extensive experience with knowledge synthesis and therefore has the experience and expertise to address these challenges.

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Contributors JPL, KMF and HTS applied for and received funding. SJMo, SJMi, MCA and JPL are the core team leading the systematic review. SJMo and JPL drafted the initial manuscript for the protocol. SJMo, DL, EAF, SS, MH, PRT, KB, MCA, SJMi, HTS and KMF provided advice at different stages during the drafting of the protocol manuscript. SJMo, DL, EAF, SS, MH, PRT, KB, MCA, SJMi, HTS and KMF approved the initial version of the manuscript that was submitted. SJMo and JPL revised the manuscript following peer review. SJMo, DL, EAF, SS, MH, PRT, KB, MCA, SJMi, HTS and KMF approved the final version of the revised manuscript that was submitted. JPL is the guarantor of the study.

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MEDLINE

- 1 COVID-19/ or SARS-CoV-2/
- 2 (coronavirus/ or betacoronavirus/ or coronavirus infections/) and (disease outbreaks/ or epidemics/ or pandemics/)
- 3 (nCoV* or 2019nCoV or 19nCoV or COVID19* or COVID or SARS-COV-2 or SARSCOV-2 or SARS-COV2 or SARSCOV2 or SARS coronavirus 2 or Severe Acute Respiratory Syndrome Coronavirus 2 or Severe Acute Respiratory Syndrome Corona Virus 2).tw,kf.
- 4 ((new or novel or "19" or "2019" or Wuhan or Hubei or China or Chinese) adj3 (coronavirus* or corona virus* or betacoronavirus* or CoV or HCoV)).tw,kf.
- 5 (long COVID* or longCOVID* or postCOVID* or post-COVID* or postcoronavirus* or post-coronavirus* or postSARS* or post-SARS*).tw,kf.
- 6 ((coronavirus* or corona virus* or betacoronavirus*) adj3 (pandemic* or epidemic* or outbreak* or crisis)).tw,kf.
- 7 ((Wuhan or Hubei) adj5 pneumonia).tw,kf.
- 8 1 or 2 or 3 or 4 or 5 or 6 or 7
- 9 limit 8 to yr="2019 -Current"
- 10 animals/ not humans/
- 11 9 not 10
- 12 adolescent/ or child/
- 13 (adolescen* or child or children or teen* or youth*).tw,kf.
- 14 12 or 13
- 15 11 and 14
- 16 limit 11 to ("child (6 to 12 years)" or "adolescent (13 to 18 years)")
- 17 15 or 16
- 18 ((parks or play or playground*) adj5 (cleaning or closure* or closed or distancing or restrict* or limit* or masks or masking or shutdown* or shut down*)).tw,kf.
- 19 ((college* or school* or universit*) adj5 (cleaning or closed or closure* or distancing or interrupt* or lockdown* or limit* or masks or masking or restrict* or saniti* or shutdown* or shut down* or suspen* or ventilat* or (covid* adj2 test*) or (covid* adj2 vaccin*))).tw,kf.
- 20 (in-person learning adj5 (interrupt* or limit* or restrict* or suspen*)).tw,kf.
- 21 home schooling.tw,kf.
- 22 ((at home or hybrid or online or remote) adj (educat* or learning)).tw,kf.
- 23 ((extracurricular or extra-curricular or intramural or school* or weekend) adj5 (activities or clubs or hobbies or sports or team or athletes or groups)).tw,kf.
- 24 18 or 19 or 20 or 21 or 22 or 23
- 25 17 and 24
- 26 limit 25 to (comment or editorial or letter)
- 27 25 not 26

EMBASE

- 1 COVID-19/ or SARS-CoV-2/
- 2 (coronavirus/ or betacoronavirus/ or coronavirus infections/) and (disease outbreaks/ or epidemics/ or pandemics/)
- 3 (nCoV* or 2019nCoV or 19nCoV or COVID19* or COVID or SARS-COV-2 or SARSCOV-2 or SARS-COV2 or SARSCOV2 or SARS coronavirus 2 or Severe Acute Respiratory Syndrome Coronavirus 2 or Severe Acute Respiratory Syndrome Corona Virus 2).tw,kf.
- 4 ((new or novel or "19" or "2019" or Wuhan or Hubei or China or Chinese) adj3 (coronavirus* or corona virus* or betacoronavirus* or CoV or HCoV)).tw,kf.
- 5 (long COVID* or longCOVID* or postCOVID* or post-COVID* or postcoronavirus* or post-coronavirus* or postSARS* or post-SARS*).tw,kf.
- 6 ((coronavirus* or corona virus* or betacoronavirus*) adj3 (pandemic* or epidemic* or outbreak* or crisis)).tw,kf.
- 7 ((Wuhan or Hubei) adj5 pneumonia).tw,kf.
- 8 1 or 2 or 3 or 4 or 5 or 6 or 7
- 9 limit 8 to yr="2019 -Current"
- 10 animals/ not humans/
- 11 9 not 10
- 12 adolescent/ or child/
- 13 (adolescen* or child or children or teen* or youth*).tw,kf.
- 14 12 or 13
- 15 11 and 14
- 16 limit 11 to ("child (6 to 12 years)" or "adolescent (13 to 18 years)")
- 17 15 or 16
- 18 ((parks or play or playground*) adj5 (cleaning or closure* or closed or distancing or restrict* or limit* or masks or masking or shutdown* or shut down*)).tw,kf.
- 19 ((college* or school* or universit*) adj5 (cleaning or closed or closure* or distancing or interrupt* or lockdown* or limit* or masks or masking or restrict* or saniti* or shutdown* or shut down* or suspen* or ventilat* or (covid* adj2 test*) or (covid* adj2 vaccin*))).tw,kf.
- 20 (in-person learning adj5 (interrupt* or limit* or restrict* or suspen*)).tw,kf.
- 21 home schooling.tw,kf.
- 22 ((at home or hybrid or online or remote) adj (educat* or learning)).tw,kf.
- 23 ((extracurricular or extra-curricular or intramural or school* or weekend) adj5 (activities or clubs or hobbies or sports or team or athletes or groups)).tw,kf.
- 24 18 or 19 or 20 or 21 or 22 or 23
- 25 17 and 24
- 26 limit 25 to (comment or editorial or letter)
- 27 25 not 26

PsycINFO

- 1 COVID-19/ or SARS-CoV-2/
- 2 (coronavirus/ or betacoronavirus/ or coronavirus infections/) and (disease outbreaks/ or epidemics/ or pandemics/)
- 3 TI ((nCoV* or 2019nCoV or 19nCoV or COVID19* or COVID or SARS-COV-2 or SARSCOV-2 or SARS-COV2 or SARSCOV2 or SARS coronavirus 2 or Severe Acute Respiratory Syndrome Coronavirus 2 or Severe Acute Respiratory Syndrome Corona Virus 2)) OR AB ((nCoV* or 2019nCoV or 19nCoV or COVID19* or COVID or SARS-COV-2 or SARSCOV-2 or SARS-COV2 or SARSCOV2 or SARS coronavirus 2 or Severe Acute Respiratory Syndrome Coronavirus 2 or Severe Acute Respiratory Syndrome Corona Virus 2)) OR KW ((nCoV* or 2019nCoV or 19nCoV or COVID19* or COVID or SARS-COV-2 or SARSCOV-2 or SARS-COV2 or SARSCOV2 or SARS coronavirus 2 or Severe Acute Respiratory Syndrome Coronavirus 2 or Severe Acute Respiratory Syndrome Corona Virus 2))
- 4 TI (((new or novel or "19" or "2019" or Wuhan or Hubei or China or Chinese) N3 (coronavirus* or corona virus* or betacoronavirus* or CoV or HCoV))) OR AB (((new or novel or "19" or "2019" or Wuhan or Hubei or China or Chinese) N3 (coronavirus* or corona virus* or betacoronavirus* or CoV or HCoV))) OR KW (((new or novel or "19" or "2019" or Wuhan or Hubei or China or Chinese) N3 (coronavirus* or corona virus* or betacoronavirus* or CoV or HCoV)))
- 5 TI ((long COVID* or longCOVID* or postCOVID* or post-COVID* or postcoronavirus* or post-coronavirus* or postSARS* or post-SARS*)) OR AB ((long COVID* or longCOVID* or postCOVID* or post-COVID* or postcoronavirus* or post-coronavirus* or postSARS* or post-SARS*)) OR KW ((long COVID* or longCOVID* or postCOVID* or post-COVID* or postcoronavirus* or post-coronavirus* or postSARS* or post-SARS*))
- 6 TI (((coronavirus* or corona virus* or betacoronavirus*) N3 (pandemic* or epidemic* or outbreak* or crisis))) OR AB (((coronavirus* or corona virus* or betacoronavirus*) N3 (pandemic* or epidemic* or outbreak* or crisis))) OR KW (((coronavirus* or corona virus* or betacoronavirus*) N3 (pandemic* or epidemic* or outbreak* or crisis)))
- 7 TI (((Wuhan or Hubei) N5 pneumonia)) OR AB (((Wuhan or Hubei) N5 pneumonia)) OR KW (((Wuhan or Hubei) N5 pneumonia))
- 8 S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7
- 9 animals/ NOT humans/
- 10 S8 NOT S9
- 11 adolescent/ OR child/
- 12 TI ((adolescen* or child or children or teen* or youth*)) OR AB ((adolescen* or child or children or teen* or youth*)) OR KW ((adolescen* or child or children or teen* or youth*))
- 13 S11 OR S12
- 14 S10 AND S13
- 15 S10 AND S13
- 16 S14 OR S15
- 17 TI (((parks or play or playground*) N5 (cleaning or closure* or closed or distancing or restrict* or limit* or masks or masking or shutdown* or shut down*))) OR AB (((parks or play or playground*) N5 (cleaning or closure* or closed or distancing or restrict* or limit* or masks or masking or shutdown* or shut down*))) OR KW (((parks or play or playground*) N5 (cleaning or closure* or closed or distancing or restrict* or limit* or masks or masking or shutdown* or shut down*)))
- 18 TI (((college* or school* or universit*) N5 (cleaning or closed or closure* or distancing or interrupt* or lockdown* or limit* or masks or masking or restrict* or saniti* or shutdown* or shut down* or suspen* or ventilat* or (covid* N2 test*) or (covid* N2 vaccin*)))) OR AB (((college* or school* or universit*) N5 (cleaning or closed or closure* or distancing or interrupt* or lockdown* or limit* or masks or masking or restrict* or saniti* or shutdown* or shut down* or suspen* or ventilat* or (covid* N2 test*) or (covid* N2 vaccin*)))) OR KW (((college* or school* or universit*) N5 (cleaning or closed or closure* or distancing or interrupt* or lockdown* or limit* or masks or masking or restrict* or saniti* or shutdown* or shut down* or suspen* or ventilat* or (covid* N2 test*) or (covid* N2 vaccin*))))

- 19 TI ((in-person learning N5 (interrupt* or limit* or restrict* or suspen*))) OR AB ((in-person learning N5 (interrupt* or limit* or restrict* or suspen*))) OR KW ((in-person learning N5 (interrupt* or limit* or restrict* or suspen*))))
- 20 TI home schooling OR AB home schooling OR KW home schooling
- 21 TI (((at home or hybrid or online or remote) N1 (educat* or learning))) OR AB (((at home or hybrid or online or remote) N1 (educat* or learning))) OR KW (((at home or hybrid or online or remote) N1 (educat* or learning)))
- 22 TI (((extracurricular or extra-curricular or intramural or school* or weekend) N5 (activities or clubs or hobbies or sports or team or athletes or groups))) OR AB (((extracurricular or extra-curricular or intramural or school* or weekend) N5 (activities or clubs or hobbies or sports or team or athletes or groups))) OR KW (((extracurricular or extra-curricular or intramural or school* or weekend) N5 (activities or clubs or hobbies or sports or team or athletes or groups)))
- 23 S17 OR S18 OR S19 OR S20 OR S21 OR S22
- 24 S16 AND S23
- 25 S16 AND S23
- 26 S24 NOT S25

Cochrane Central

- 1 [mh ^COVID-19]
- 2 [mh ^SARS-CoV-2]
- 3 (coronavirus or betacoronavirus or coronavirus infections) and (disease outbreaks or epidemics or pandemics)
- 4 (nCoV* or 2019nCoV or 19nCoV or COVID19* or COVID or SARS-COV-2 or SARSCOV-2 or SARS-COV2 or SARSCOV2 or SARS coronavirus 2 or Severe Acute Respiratory Syndrome Coronavirus 2 or Severe Acute Respiratory Syndrome Corona Virus 2):ti,ab,kw
- 5 ((new or novel or "19" or "2019" or Wuhan or Hubei or China or Chinese) NEAR/3 (coronavirus* or corona virus* or betacoronavirus* or CoV or HCoV)):ti,ab,kw
- 6 (long COVID* or longCOVID* or postCOVID* or post-COVID* or postcoronavirus* or post-coronavirus* or postSARS* or post-SARS*):ti,ab,kw
- 7 ((coronavirus* or corona virus* or betacoronavirus*) NEAR/3 (pandemic* or epidemic* or outbreak* or crisis)):ti,ab,kw
- 8 ((Wuhan or Hubei) NEAR/5 pneumonia):ti,ab,kw
- 9 #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8
- 10 animals NOT humans
- 11 #9 NOT #10
- 12 [mh ^adolescent]
- 13 [mh ^child]
- 14 (adolescen* or child or children or teen* or youth*):ti,ab,kw
- 15 #12 OR #13 OR #14
- 16 [mh ^adult]
- 17 #15 NOT #16
- 18 #11 AND #17
- 19 ((parks or play or playground*) NEAR/5 (cleaning or closure* or closed or distancing or restrict* or limit* or masks or masking or shutdown* or shut down*)):ti,ab,kw
- 20 ((college* or school* or universit*) NEAR/5 (cleaning or closed or closure* or distancing or interrupt* or lockdown* or limit* or masks or masking or restrict* or saniti* or shutdown* or shut down* or suspen* or ventilat* or (covid* NEAR/2 test*) or (covid* NEAR/2 vaccin*)):ti,ab,kw
- 21 ((in-person learning NEAR/5 (interrupt* or limit* or restrict* or suspen*)):ti,ab,kw
- 22 (home schooling):ti,ab,kw
- 23 (((at home or hybrid or online or remote) NEAR/1 (educat* or learning))):ti,ab,kw
- 24 ((extracurricular or extra-curricular or intramural or school* or weekend) NEAR/5 (activities or clubs or hobbies or sports or team or athletes or groups)):ti,ab,kw
- 25 #19 OR #20 OR #21 OR #22 OR #23 OR #24
- 26 #18 AND #25

ERIC

(MAINSUBJECT.EXACT("COVID-19") AND MAINSUBJECT.EXACT("Pandemics")) OR ((tiab(COVID-19) OR if(COVID-19)) AND (tiab(pandemic*) OR if(pandemic*)))

(MAINSUBJECT.EXACT("Adolescents") OR MAINSUBJECT.EXACT("Preadolescents") OR MAINSUBJECT.EXACT("Early Adolescents")) OR (MAINSUBJECT.EXACT("Children") OR MAINSUBJECT.EXACT("Youth")) OR (tiab(adolescenc* OR preadolescenc* OR (early NEAR/1 adolescen*) child* OR teen* or youth*) OR if(adolescen* OR preadolescenc* OR (early NEAR/1 adolescen*) child* OR teen* or youth*))

(tiab(parks NEAR/5 cleaning) OR if(parks NEAR/5 cleaning) OR tiab(parks NEAR/5 closure*) OR if(parks NEAR/5 closure*) OR tiab(parks NEAR/5 closed) OR if(parks NEAR/5 closed) OR tiab(parks NEAR/5 distancing) OR if(parks NEAR/5 distancing) OR tiab(parks NEAR/5 restrict*) OR if(parks NEAR/5 restrict*) OR tiab(parks NEAR/5 limit*) OR if(parks NEAR/5 limit*) OR tiab(parks NEAR/5 masks) OR if(parks NEAR/5 masks) OR tiab(parks NEAR/5 masking) OR if(parks NEAR/5 masking) OR tiab(parks NEAR/5 shutdown*) OR if(parks NEAR/5 shutdown*) OR tiab(parks NEAR/5 shut down*) OR if(parks NEAR/5 shutdown*)) OR (tiab(play NEAR/5 cleaning) OR if(play NEAR/5 cleaning) OR tiab(play NEAR/5 closure*) OR if(play NEAR/5 closure*) OR tiab(play NEAR/5 closed) OR if(play NEAR/5 closed) OR tiab(play NEAR/5 distancing) OR if(play NEAR/5 distancing) OR tiab(play NEAR/5 restrict*) OR if(play NEAR/5 restrict*) OR tiab(play NEAR/5 limit*) OR if(play NEAR/5 limit*) OR tiab(play NEAR/5 masks) OR if(play NEAR/5 masks) OR tiab(play NEAR/5 masking) OR if(play NEAR/5 masking) OR tiab(play NEAR/5 shutdown*) OR if(play NEAR/5 shutdown*) OR tiab(play NEAR/5 shut down*) OR if(play NEAR/5 shut down*)) OR (tiab(playground* NEAR/5 cleaning) OR if(playground* NEAR/5 cleaning) OR tiab(playground* NEAR/5 closure*) OR if(playground* NEAR/5 closure*) OR tiab(playground* NEAR/5 closed) OR if(playground* NEAR/5 closed) OR tiab(playground* NEAR/5 distancing) OR if(playground* NEAR/5 distancing) OR tiab(playground* NEAR/5 restrict*) OR if(playground* NEAR/5 restrict*) OR tiab(playground* NEAR/5 limit*) OR if(playground* NEAR/5 limit*) OR tiab(playground* NEAR/5 masks) OR if(playground* NEAR/5 masks) OR tiab(playground* NEAR/5 masking) OR if(playground* NEAR/5 masking) OR tiab(playground* NEAR/5 shutdown*) OR if(playground* NEAR/5 shutdown*) OR tiab(playground* NEAR/5 shut down*) OR if(playground* NEAR/5 shut down*))

CINAHL

- 1 COVID-19/ or SARS-CoV-2/
- 2 (coronavirus/ or betacoronavirus/ or coronavirus infections/) and (disease outbreaks/ or epidemics/ or pandemics/)
- 3 TI ((nCoV* or 2019nCoV or 19nCoV or COVID19* or COVID or SARS-COV-2 or SARSCOV-2 or SARS-COV2 or SARSCOV2 or SARS coronavirus 2 or Severe Acute Respiratory Syndrome Coronavirus 2 or Severe Acute Respiratory Syndrome Corona Virus 2)) OR AB ((nCoV* or 2019nCoV or 19nCoV or COVID19* or COVID or SARS-COV-2 or SARSCOV-2 or SARS-COV2 or SARSCOV2 or SARS coronavirus 2 or Severe Acute Respiratory Syndrome Coronavirus 2 or Severe Acute Respiratory Syndrome Corona Virus 2)) OR MW ((nCoV* or 2019nCoV or 19nCoV or COVID19* or COVID or SARS-COV-2 or SARSCOV-2 or SARS-COV2 or SARSCOV2 or SARS coronavirus 2 or Severe Acute Respiratory Syndrome Coronavirus 2 or Severe Acute Respiratory Syndrome Corona Virus 2))
- 4 TI (((new or novel or "19" or "2019" or Wuhan or Hubei or China or Chinese) N3 (coronavirus* or corona virus* or betacoronavirus* or CoV or HCoV))) OR AB (((new or novel or "19" or "2019" or Wuhan or Hubei or China or Chinese) N3 (coronavirus* or corona virus* or betacoronavirus* or CoV or HCoV))) OR MW (((new or novel or "19" or "2019" or Wuhan or Hubei or China or Chinese) N3 (coronavirus* or corona virus* or betacoronavirus* or CoV or HCoV)))
- 5 TI ((long COVID* or longCOVID* or postCOVID* or post-COVID* or postcoronavirus* or post-coronavirus* or postSARS* or post-SARS*)) OR AB ((long COVID* or longCOVID* or postCOVID* or post-COVID* or postcoronavirus* or post-coronavirus* or postSARS* or post-SARS*)) OR MW ((long COVID* or longCOVID* or postCOVID* or post-COVID* or postcoronavirus* or post-coronavirus* or postSARS* or post-SARS*))
- 6 TI (((coronavirus* or corona virus* or betacoronavirus*) N3 (pandemic* or epidemic* or outbreak* or crisis))) OR AB (((coronavirus* or corona virus* or betacoronavirus*) N3 (pandemic* or epidemic* or outbreak* or crisis))) OR MW (((coronavirus* or corona virus* or betacoronavirus*) N3 (pandemic* or epidemic* or outbreak* or crisis)))
- 7 TI (((Wuhan or Hubei) N5 pneumonia)) OR AB (((Wuhan or Hubei) N5 pneumonia)) OR MW (((Wuhan or Hubei) N5 pneumonia))
- 8 S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7
- 9 animals/ NOT humans/
- 10 S8 NOT S9
- 11 adolescent/ OR child/
- 12 TI ((adolescen* or child or children or teen* or youth*)) OR AB ((adolescen* or child or children or teen* or youth*)) OR MW ((adolescen* or child or children or teen* or youth*))
- 13 S11 OR S12
- 14 S10 AND S13
- 15 S10 AND S13
- 16 S14 OR S15
- 17 TI (((parks or play or playground*) N5 (cleaning or closure* or closed or distancing or restrict* or limit* or masks or masking or shutdown* or shut down*))) OR AB (((parks or play or playground*) N5 (cleaning or closure* or closed or distancing or restrict* or limit* or masks or masking or shutdown* or shut down*))) OR MW (((parks or play or playground*) N5 (cleaning or closure* or closed or distancing or restrict* or limit* or masks or masking or shutdown* or shut down*)))
- 18 TI (((college* or school* or universit*) N5 (cleaning or closed or closure* or distancing or interrupt* or lockdown* or limit* or masks or masking or restrict* or saniti* or shutdown* or shut down* or suspen* or ventilat* or (covid* N2 test*) or (covid* N2 vaccin*)))) OR AB (((college* or school* or universit*) N5 (cleaning or closed or closure* or distancing or interrupt* or lockdown* or limit* or masks or masking or restrict* or saniti* or shutdown* or shut down* or suspen* or ventilat* or (covid* N2 test*) or (covid* N2 vaccin*)))) OR MW (((college* or school* or universit*) N5 (cleaning or closed or closure* or distancing or interrupt* or lockdown* or limit* or masks or masking or restrict* or saniti* or shutdown* or shut down* or suspen* or ventilat* or (covid* N2 test*) or (covid* N2 vaccin*))))

- 19 TI ((in-person learning N5 (interrupt* or limit* or restrict* or suspen*))) OR AB ((in-person learning N5 (interrupt* or limit* or restrict* or suspen*))) OR MW ((in-person learning N5 (interrupt* or limit* or restrict* or suspen*)))
- 20 TI home schooling OR AB home schooling OR KW home schooling
- 21 TI (((at home or hybrid or online or remote) N1 (educat* or learning))) OR AB (((at home or hybrid or online or remote) N1 (educat* or learning))) OR MW (((at home or hybrid or online or remote) N1 (educat* or learning)))
- 22 TI (((extracurricular or extra-curricular or intramural or school* or weekend) N5 (activities or clubs or hobbies or sports or team or athletes or groups))) OR AB (((extracurricular or extra-curricular or intramural or school* or weekend) N5 (activities or clubs or hobbies or sports or team or athletes or groups))) OR MW (((extracurricular or extra-curricular or intramural or school* or weekend) N5 (activities or clubs or hobbies or sports or team or athletes or groups)))
- 23 S17 OR S18 OR S19 OR S20 OR S21 OR S22
- 24 S16 AND S23
- 25 S16 AND S23
- 26 S24 NOT S25