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Strategies to Mitigate the Impact of the COVID-19 Pandemic on Child and Youth Well-being: A Scoping Review Protocol

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Manuscripts

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 the emotional impacts of trauma. The wide-ranging negative effects of the COVID-19 pandemic on children and youth have been well established. There is a pressing need for a comprehensive summary of strategies to mitigate potentiality deleterious impacts of the COVID-19 pandemic on child and youth well-being to understand, respond to, and support the recovery from the multifaceted impacts of the COVID-19 pandemic on children, youth, and families.

Methods and Analysis

We will conduct a scoping review following the Arksey-O'Malley 5-stage scoping review method and the Scoping Review Methods Manual by the Joanna Briggs Institute. We will search relevant bibliographic databases (e.g., CINAHL, MEDLINE, PsycINFO, ERIC) and grey literature sources. We will include all primary qualitative and quantitative methodologies, excluding protocols, reports, opinions, and editorials, to identify novel data reported 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 the screening criteria and data abstraction form and will independently screen records and abstract the data. Data synthesis will be performed according to the convergent integrated approach as described by the Joanna Briggs Institute.

Ethics and Dissemination

Ethical approval is not applicable as this review will be conducted on published data only. This scoping review will identify, describe, and categorize strategies taken to mitigate potentially deleterious impacts of the COVID-19 pandemic on children, youth, and their families. We will

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2
3 provide a comprehensive synthesis by developing a bibliography of strategies and associated
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5 outcomes. Through the involvement of affected children, youth, their family members and
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7 healthcare providers, our results will inform the co-development of integrated knowledge
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9 translation interventions to close the most important gaps in recovery from pandemic events
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11 facing children, youth, and families.
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16
17
18 *Key Words*
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20 Child; Youth; Well-Being; COVID-19; Pandemic; Impact
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Article Summary

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 5-stage scoping review method and will conform to the manual by the Joanna Briggs Institute.
- We will include all primary qualitative and quantitative 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 outlining and categorizing strategies accurately based on what is briefly reported in the published literature.

Background

In March 2020 the World Health Organization (WHO) declared the novel coronavirus (COVID-19) 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 learned 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 (e.g., 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.

In comparison to adults, children and youth may have different difficulties, worries, and necessities related to the COVID-19 pandemic.⁴ It is also more challenging to recognize and mitigate misinformation in this population¹⁰ as children and youth obtain information from different sources than adults (e.g., social media platforms).^{11 12} Family relationships⁵ and social supports,¹³ while reported to protect child and youth well-being during the COVID-19 pandemic, have also been adversely affected by pandemic situations and may need to be included as well for effective interventions.¹⁷ Understanding the broad range of strategies (e.g., tools for mental health) that have been taken to mitigate potentially deleterious impacts of the COVID-19 pandemic (e.g., loneliness, isolation, illness) on the well-being of children, youth, and their

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2
3 families, and translating findings into actionable interventions to support recovery and
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5 resilience, is vital to ensuring the well-being of this priority population.
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10 We report a protocol for a scoping review designed to identify, describe, and categorize any
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12 strategy taken during the COVID-19 pandemic to address the impact of the COVID-19 pandemic
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14 on child and youth well-being (including their families if data is presented). For the purposes of
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16 this review, optimal well-being (including the domains of health, connectedness, safety,
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18 learning, and agency¹⁴) is defined as when “children and youth have the support, confidence,
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20 and resources to thrive in contexts of secure and healthy relationships, realizing their full
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22 potential and rights.”¹⁵ The results of our scoping review will directly inform integrated
23
24 knowledge translation interventions at the individual, family unit, and health and education
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26 systems levels, to close the most important gaps in recovery from pandemic events facing
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28 children, youth, and families.
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37 **Review Questions**

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39 This scoping review will be conducted as per the Arksey-O’Malley 5-stage scoping review
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41 method¹⁶ and the Scoping Review Methods Manual by the Joanna Briggs Institute.¹⁷ The
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43 Preferred Reporting Items for Systematic Reviews and Meta-analysis Protocols (PRISMA-P)
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45 guideline was used to develop the protocol.¹⁸ We will adhere to the PRISMA-ScR Extension for
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47 Scoping Reviews to report findings from the completed scoping review.¹⁹
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3 The primary research question underpinning this scoping review is: What strategies have been
4 taken to mitigate potentially deleterious impacts of the COVID-19 pandemic on child and youth
5 well-being?
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12 The components of population, exposure, comparator, outcome, study design, and timeframe
13 are as follows:
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- 15 • Population: Children or youth (≥ 10 and ≤ 18 years) their (immediate and extended)
16 families (if presented).
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- 18 • Exposure: Strategies (specific to children and youth) that have been taken to mitigate
19 potentially deleterious impacts of the COVID-19 pandemic.
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- 21 • Comparator: Any comparator will be accepted.
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- 23 • Outcomes: Any (self-report or observer-report) assessments or perspectives of, or
24 experiences with, a strategy implemented to mitigate potentially deleterious impacts of
25 the COVID-19 pandemic.
26
- 27 • Study Design: Any observational, qualitative, or interventional primary research study,
28 excluding protocols, reviews, commentaries, editorials, opinions, case studies and case
29 reports, book chapters and dissertations. We will exclude publications in pre-print.
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- 31 • Timeframe: Publications from December 01, 2019 to present.
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50 **Methods and Design**

51 *Study designs eligible*

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We will include any published article that reports novel findings including primary observational studies (e.g., cross-sectional [surveys], cohort, case-control studies), qualitative research, or interventional studies (e.g., randomized controlled trials). We will exclude dissertations, reviews, commentaries, editorials, opinions, case studies and case reports, as well as articles in pre-print repositories (Table 1).

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 10 to 18 years.	The study's population includes family members but does not include children or youth
The study reports on a strategy to mitigate the impact of the COVID-19 pandemic	The study reports on a strategy to mitigate the impact of the COVID-19 pandemic
The study's outcome(s) are any assessments, perspectives, or experiences with the strategy	The study's outcome is something other than any assessments, perspectives, or experiences with the strategy on children and youth
The study was conducted on a strategy enacted on or after December 01, 2019	The study was conducted on a strategy enacted before December 01, 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

Participant eligibility

Eligible study populations will include children and youth (hereafter referred to as youth and age defined as ≥ 10 and ≤ 18 years,²⁰ capturing the portion of children and youth in adolescence and emerging independence). Eligible studies do not need to include immediate (i.e., nuclear) or extended (i.e., 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 status if

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3 reported. We will include studies that report on strategies that are mediated by another
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5 individual (or group) in addition to the youth (or parent/guardian) (e.g., mental well-being
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7 approaches that are mediated through psychologists or occupational therapists, social well-
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9 being approaches that are mediated through school teachers).²¹ This research builds on our
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11 funded national program of pandemic preparedness research to examine the knowledge,
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13 perceptions, behaviours, and associated impact of the pandemic and related restrictions on the
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15 Canadian public (aged 10 or older) to develop evidence-informed solutions to enhance
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17 pandemic recovery.
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25 *Exposures eligible*

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27 The exposure is any strategies that have been taken to mitigate potentially deleterious impacts
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29 of the COVID-19 pandemic on children and youth well-being. To manage the amount of
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31 literature retrieved, we will only include strategies that are specific to children and youth.
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37 *Outcome measures eligible*

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39 All eligible studies will present a (quantitative) assessment of the approach, or (qualitative)
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41 perspectives (i.e., views or prospects) or experiences (i.e., encounters) with a strategy
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43 implemented to mitigate potentially deleterious impacts of the COVID-19 pandemic on youth
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45 well-being. We will include studies that report on any strategy taken during the COVID-19
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47 pandemic to address youth well-being with optimal well-being defined as when “children or
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49 youth have the support, confidence, and resources to thrive in contexts of secure and healthy
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51 relationships, realizing their full potential and rights.”¹⁵ Given the expectation that well-being
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3 approaches or strategies will have psychological and cognitive mediators, studies that report on
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5 any outcome related to mental health (encompassing psychology and psychiatry) will also be
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7 eligible for inclusion. As we expect outcome measures to vary and use different measurement
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9 tools, we will not prespecify principal summary measures. The overall findings in relation to
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11 perspectives and experiences will be summarized individually and collectively. We will not
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13 combine included studies in meta-analyses given our desire to understand and interpret the
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15 variation in approaches and strategies between five domains of child and youth well-being (that
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17 include: health, connectedness, safety, learning; agency¹⁴). Rather, we will summarize studies
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19 using narrative synthesis.
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28 *Timeframe eligible*

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30 Eligible studies will be publications from December 01, 2019 to present. Search results will be
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32 updated prior to manuscript submission.
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37 *Search methods for identification of studies*

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39 Articles in all languages for this review will be identified in CINAHL, Cochrane CENTRAL Register
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41 of Controlled Trials, EMBASE, ERIC, Education Research Complete, MEDLINE, and APA PsycINFO.
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43 The search strategy for MEDLINE was developed by a librarian co-investigator in collaboration
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45 with other members of the team.²² A range of broad search terms will be used to maximize the
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47 yield of the search for studies. Search terms were selected based on components of child and
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49 youth well-being during the COVID-19 pandemic, and strategies, solutions, tools, and
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51 interventions. The full search strategy for the MEDLINE database can be found in Online
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3 Appendix 1. Owing to the complexity and quantity of literature that is expected to be retrieved,
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5 grey literature searches will not be performed.
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10 *Selection of eligible studies*

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12 At the title and abstract screening stage, a subset of the team (SJMo, SJMi) will achieve 100%
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14 agreement on a calibration exercise of 50 random citations prior to commencing selection of
15
16 eligible studies. After reliability in reference screening is ensured, two reviewers (SJMo, SJMi)
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18 will use Covidence to independently screen titles and abstracts in duplicate for potential
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20 inclusion using screening questions developed for this review (Table 2). Any study selected by
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22 any reviewer at this stage will progress to the next stage. After initial screening, two authors
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24 (SJMo, SJMi) will examine full-texts independently and in duplicate for eligibility and for
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26 development of the final data abstraction table. A separate calibration exercise will be then
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28 performed for screening reference lists of selected articles. (e.g., literature reviews or summary
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30 reports on this topic). Two independent authors (SJMo, SJMi) will screen reference lists of
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32 selected articles in duplicate to identify additional relevant articles for potential study selection;
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34 original articles will be sourced, and the full text assessed for eligibility. Disagreements in study
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36 selection at the full-text stage will be resolved by a third reviewer (MCA).
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Table 2. Screening questions to identify literature for including 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 question to be used to identify literature to be included in the full-text screening process</i>			
Study design: Does the title/abstract describe an observational or interventional primary research study, including focus groups and qualitative inquires?	Yes: The study employs an observational or interventional primary research design, including focus groups and qualitative inquires.	No: The study is a protocol, review, commentary, editorial, opinion, case study, case report, thesis, pre-print, 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 inquires.
Publication type: 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.
Population: Does the population of interest include children or youth aged 10 to 18 years?	Yes: The study population describes children or youth.	No: The population of interest does not include children or youth.	Unclear: It is unclear if the population of interest includes children or youth.
Exposure: 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?
Outcome: Does the title and/or abstract report assessments, perspectives, or experiences on strategies implemented to mitigate the impact of the COVID-19 pandemic on child and youth well-being (health; connectedness; safety; learning; agency)?	Yes: One or more of the outcomes in the study are related to assessments, perspectives, or experiences on strategies implemented to mitigate the impact of the COVID-19 pandemic on child and youth well-being (health; connectedness; safety; learning; agency)?	No: There is no outcome in the study related to any of assessments, perspectives, or experiences on strategies implemented to mitigate the impact of the COVID-19 pandemic on child and youth well-being (health; connectedness; safety; learning; agency).	Unclear: It is unclear from the title and abstract if the outcome of interest is related to any of assessments, perspectives, or experiences on strategies implemented to mitigate the impact of the COVID-19 pandemic on child and youth well-being (health; connectedness; safety; learning; agency).
Screening domain and question	Characteristics for assessment		
	Yes—include	No—exclude	
<i>Full article screen questions to be used to identify literature for inclusion in the systematic review</i>			
<i>*full article screening questions include all screening domains and questions from title and abstract screening, and two additional domains</i>			
Time Frame: Was the strategy enacted on or after December 01, 2019?	Yes: The strategy was enacted on or after December 01, 2019.	No: The strategy was enacted before December 01, 2019.	
Setting: 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.	

Data abstraction from included studies

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

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

Data domain	Data categories
<u>Study identifiers</u> : From a published study.	Authors' names; study title; publication type; publication date; journal, volume, issue, and page numbers of publication; place of publication (i.e., first author's institutional email address); and digital object identifier
<u>Study design</u> : Primary research.	Study type or design; time frame of study; location of study (i.e., country); and region of study (localized when reported)
<u>Participants</u> : Children and youth and (if reported) their family member or guardians	Definition and size (i.e., N) of the source population(s) at risk; relevant demographic information (e.g., age, sex, gender, ethnicity, grade in school, type of school, relationship to guardian if not parent)
<u>Exposure</u> : Any strategy implemented to mitigate potentially deleterious impacts of the COVID-19 pandemic on children or youth.	Strategy type, duration (if applicable), location (i.e., geographical)
<u>Outcome</u> : Assessments, perspectives, or experiences on strategies implemented to mitigate the impact of the COVID-19 pandemic on child and youth well-being (health; connectedness; safety; learning; agency).	Child, youth, or parent/guardian COVID-19 status; assessment tool(s); timepoint of assessment(s); perspectives (i.e., mental views or prospects); experiences (i.e., encounters); statistical significance; authors' conclusions and recommendations; steps or guiding principles to conduct the strategy (e.g., elements, or a step-wise protocol); derivation of the strategy from empirical evidence (i.e., if derived from observation and experiment, or published theory); minimum expertise to conduct the strategy (i.e., whether additional personnel are required [e.g., social worker, psychiatrist]); limitations to the strategy (e.g., requirement of stable WiFi connection or personal device); reproducibility of the strategy (i.e., operationalized, evidenced by use in multiple settings); feasibility of the strategy to other contexts (i.e., generalizable, considering internal validity should precede external validity).

¹Data will be categorized according to the "Inform, Activate, Collaborate Framework" developed by our team

Process for data abstraction

A data abstraction form will be created in Microsoft Excel. The abstraction form will be piloted and tested by the data abstractors (SJMo, SJMi) on a subset of studies (i.e., 5% of studies if $n > 50$, 10% of studies if $n \leq 50$) to ensure clarity. Following pilot testing, the form will be adapted as recommended by the abstractors to improve usability and completeness. The first author (SJMo) and one additional abstractor (SJMi) 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 is unclear, missing, or presented in a format that is unusable or cannot be abstracted, we will attempt to contact corresponding authors for clarification. We will contact authors via email, and a follow-up email will be sent 2-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.

Strategies for 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

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3 integration with qualitative data.²³ These textual descriptions will be assembled and pooled
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5 with qualitative data, extracted directly from the included qualitative studies. Categories of
6
7 pooled data will be aggregated to produce the overall findings of the review.
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10 11 12 *Presentation of the results*

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15 The final search strategy for each database and all ancillary searches conducted will be provided
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17 as an appendix in the final publication. A flow chart, following the PRISMA-ScR Extension for
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19 Scoping Reviews,¹⁹ will illustrate where citations were eliminated during screening and ancillary
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21 searches, including rationale for exclusion in full-text screening. All included studies will be
22
23 presented in a narrative synthesis. A table of characteristics of included studies will be included
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25 in the published journal article and will describe study identifiers and period of study, sample
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27 and setting, strategy, direction and magnitude of the outcome, and authors' conclusions and
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29 recommendations. Descriptive statistics will be provided as extensions of this table when
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31 appropriate or in the narrative synthesis. Results from our convergent integrated approach to
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33 data synthesis will be presented as a separate table and summarized narratively in the results.
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42 We will utilize the "Inform, Activate, Collaborate Framework" developed by our team²⁴ to
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44 categorize the strategies that we identify in our review to present a catalogue of strategies with
45
46 the ultimate goals to: (1) inform the global community of pandemic policies and stressors most
47
48 impacting youth and families; (2) activate progressive youth and family participation for
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50 increased understanding and promotion of positive behaviours to wellbeing; and (3) foster
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52 collaboration between community members, educators, researchers, youth and family
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3 organizations, decision makers, and health professionals in regards to pandemic policies and
4 their impact on youth and family wellbeing. Wellbeing outcomes measures will be categorized
5 according to the framework for child and youth wellbeing, including the domains of health,
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organizations, decision makers, and health professionals in regards to pandemic policies and their impact on youth and family wellbeing. Wellbeing outcomes measures will be categorized according to the framework for child and youth wellbeing, including the domains of health, connectedness, safety, learning, and agency.¹⁴

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.²⁵ The proposed review will abide by the CIHR-guiding core principles of inclusiveness, mutual respect, support, and co-building.²⁶ We will adhere to the GRIPP-2 reporting guidelines for patient and public involvement.²⁷ Youth involvement (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 (e.g., physician, psychologist) have established a track record of co-leading national peer-reviewed grants and research success in publishing with knowledge users.^{28 29}

Knowledge translation plan

We will use an integrated knowledge translation approach through the inclusion of knowledge users (i.e., youth and family members, and multidisciplinary healthcare providers). The

underpinning knowledge translation framework for this work will be Graham's Knowledge-to-Action (KTA) framework.³⁰ 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 team²⁴ for continuity with knowledge users and stakeholder groups. This will allow the opportunity to elicit generalizable findings that can directly inform practice and policy decisions related to youth during COVID-19, and for future pandemics.

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 (e.g., social media, blogs)
An in-depth synthesis and comparison of results and insights on strategies, including categorization 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.

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.

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 method systematic reviews, as described by the Joanna Briggs Institute,³¹ our results will rapidly provide evidence to inform the development of adaptable youth interventions, related policies, and decision-making at both government and organizational 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

1
2
3 to develop a catalogue of strategies according to the five domains of youth well-being,³² as well
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5 as the level of engagement (i.e., inform, activate, collaborate) necessary for the strategy to have
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7 a desirable effect. This catalogue will provide a systematic process for policy makers to make
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9 informed decisions about which strategy is the most appropriate to address and mitigate
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11 potentially negative impacts from the COVID-19 pandemic, that will directly inform practice and
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13 policy decisions.
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20 Our work will help to identify gaps in the literature where primary evidence is needed. We
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22 anticipate that this scoping review will lead to several subsequent systematic reviews. For
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24 example, one future systematic review may focus on mental health interventions to increase
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26 youth connectedness. We also expect that this review may inform future studies on effective
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28 well-being interventions and psychological strategies for youth and their families impacted by
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30 COVID-19, that will enhance the extent and quality of the research evidence base.
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37 Finally, this review will directly inform a sequential explanatory mixed methods design³³ study
38
39 that involves three intersecting phases of work anchored conceptually to the five domains of
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41 youth well-being. The overarching goal of our work is to partner with youth and families by
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43 engaging around pandemic experiences and recovery needs, educating on best available
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45 resources, and empowering involvement in the development of targeted resources that support
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47 recovery and resilience.
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Authorship and Guarantor Information

All those designated as authors have met all ICMJE criteria for authorship.

1. Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
2. Drafting the work or revising it critically for important intellectual content; AND
3. Final approval of the version to be published; AND
4. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Author Statement

JPL applied for and received funding.

SJMo, SJMi, MCA, JPL are the core team leading the systematic review.

SJM and JPL drafted the initial manuscript for the protocol.

All authors provided advice at different stages during drafting of the protocol manuscript.

All authors approved the initial version of the manuscript that was submitted.

SJM and JPL revised the manuscript following peer-review.

All authors approved the final version of the revised manuscript that was submitted.

JPL is the guarantor and attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

SJM and JPL affirm that this manuscript is an honest, accurate, and transparent account of the study that will be reported; that no important aspects of the study will be omitted; and that any discrepancies from the study as planned (and described in the protocol) will be explained.

Data Sharing and Availability of Materials

All data available in published records. Statistical code will be shared given reasonable request.

Competing Interests

The authors report no competing interests, financial or otherwise.

Word Count

Abstract, 296; Manuscript, 2819

Key Words

COVID-19; Child; Youth; Family; Well-being

References

1. World Health Organization. Rolling updates on coronavirus disease (COVID-19) Geneva: World Health Organization; 2020 [Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen> accessed April 12 2020.
2. Government of Canada. Coronavirus disease (COVID-19): Guidance documents [2021-04-07]:[Available from: <https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/guidance-documents.html> accessed April 8 2021.
3. Peek L. Children and Disasters: Understanding Vulnerability, Developing Capacities, and Promoting Resilience; An Introduction. *Children, Youth and Environments* 2008;18(1):1-29.
4. Hawke LD, Barbic SP, Voineskos A, et al. Impacts of COVID-19 on Youth Mental Health, Substance Use, and Well-being: A Rapid Survey of Clinical and Community Samples. *Can J Psychiatry* 2020;65(10):701-09. doi: 10.1177/0706743720940562 [published Online First: 2020/07/15]
5. Magson NR, Freeman JYA, Rapee RM, et al. Risk and Protective Factors for Prospective Changes in Adolescent Mental Health during the COVID-19 Pandemic. *J Youth Adolesc* 2021;50(1):44-57. doi: 10.1007/s10964-020-01332-9 [published Online First: 2020/10/28]
6. Chaabane S, Doraiswamy S, Chaabna K, et al. The Impact of COVID-19 School Closure on Child and Adolescent Health: A Rapid Systematic Review. *Children (Basel)* 2021;8(5) doi: 10.3390/children8050415 [published Online First: 2021/06/03]
7. Roos LE, Salisbury M, Penner-Goeke L, et al. Supporting families to protect child health: Parenting quality and household needs during the COVID-19 pandemic. *PLoS One* 2021;16(5):e0251720. doi: 10.1371/journal.pone.0251720 [published Online First: 2021/05/25]
8. Cost KT, Crosbie J, Anagnostou E, et al. Mostly worse, occasionally better: impact of COVID-19 pandemic on the mental health of Canadian children and adolescents. *Eur Child Adolesc Psychiatry* 2021 doi: 10.1007/s00787-021-01744-3 [published Online First: 2021/02/28]
9. Racine N, Korczak DJ, Madigan S. Evidence suggests children are being left behind in COVID-19 mental health research. *European child & adolescent psychiatry* 2020:1-2. doi: 10.1007/s00787-020-01672-8
10. Yang XY, Gong RN, Sassine S, et al. Risk Perception of COVID-19 Infection and Adherence to Preventive Measures among Adolescents and Young Adults. *Children (Basel)* 2020;7(12) doi: 10.3390/children7120311 [published Online First: 2020/12/30]
11. Bryson A. In age of coronavirus, could social media be kids' saving grace? *Desert Sun* 2020 April 12, 2020. <https://www.desertsun.com/story/news/education/2020/04/12/coronavirus-kids-cope-pandemic-snapchat-tiktok-instagram/5126302002/> (accessed July 22, 2021).
12. Thompson V. Why are youth flocking to TikTok to cope with the COVID-19 pandemic? 2020. <https://news.yorku.ca/2020/04/02/why-are-youth-flocking-to-tiktok-to-cope-with-the-covid-19-pandemic/>.

13. Moore SA, Faulkner G, Rhodes RE, et al. Impact of the COVID-19 virus outbreak on movement and play behaviours of Canadian children and youth: a national survey. *Int J Behav Nutr Phys Act* 2020;17(1):85. doi: 10.1186/s12966-020-00987-8 [published Online First: 2020/07/08]
14. Ross DA, Hinton R, Melles-Brewer M, et al. Adolescent Well-Being: A Definition and Conceptual Framework. *J Adolesc Health* 2020;67(4):472-76. doi: 10.1016/j.jadohealth.2020.06.042 [published Online First: 2020/08/13]
15. Ross DA, Hinton R, Melles-Brewer M, et al. Adolescent Well-Being: A Definition and Conceptual Framework. *Journal of Adolescent Health* 2020;67(4):472-76. doi: 10.1016/j.jadohealth.2020.06.042
16. Arksey H. Scoping the field: services for carers of people with mental health problems. *Health Soc Care Community* 2003;11(4):335-44. [published Online First: 2003/11/25]
17. Joanna Briggs I. The Joanna Briggs Institute best practice information sheet: the effectiveness of pelvic floor muscle exercises on urinary incontinence in women following childbirth. *Nurs Health Sci* 2011;13(3):378-81. doi: 10.1111/j.1442-2018.2011.00617.x [published Online First: 2011/06/22]
18. Moher D, Shamseer L, Clarke M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Syst Rev* 2015;4:1. doi: 10.1186/2046-4053-4-1 [published Online First: 2015/01/03]
19. Tricco AC, Lillie E, Zarin W, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med* 2018;169(7):467-73. doi: 10.7326/M18-0850 [published Online First: 2018/09/05]
20. World Health Organization. Adolescent Health Geneva: The WHO; 2021 [Available from: <https://www.who.int/health-topics/adolescent-health> accessed July 20, 2021.
21. Colao A, Piscitelli P, Pulimeno M, et al. Rethinking the role of the school after COVID-19. *The Lancet Public Health* 2020;5(7):e370. doi: 10.1016/S2468-2667(20)30124-9
22. McGowan J, Sampson M, Salzwedel DM, et al. PRESS Peer Review of Electronic Search Strategies: 2015 Guideline Statement. *J Clin Epidemiol* 2016;75:40-6. doi: 10.1016/j.jclinepi.2016.01.021 [published Online First: 2016/03/24]
23. Thomas J, Harden A. Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Med Res Methodol* 2008;8:45. doi: 10.1186/1471-2288-8-45 [published Online First: 2008/07/12]
24. Fiest KM, McIntosh CJ, Demiantschuk D, et al. Translating evidence to patient care through caregivers: a systematic review of caregiver-mediated interventions. *BMC Med* 2018;16(1):105. doi: 10.1186/s12916-018-1097-4
25. Lowrie E, Tyrrell-Smith R. Using a Community-Engaged Research (CEnR) approach to develop and pilot a photo grid method to gain insights into early child health and development in a socio-economic disadvantaged community. *Res Involv Engagem* 2017;3:29. doi: 10.1186/s40900-017-0078-7 [published Online First: 20171218]
26. Strategy for Patient-Oriented Research- Patient Engagement Framework 2019: Canadian Institutes of Health Research, 2019.
27. Staniszewska S, Brett J, Simera I, et al. GRIPP2 reporting checklists: tools to improve reporting of patient and public involvement in research. *BMJ* 2017;358:j3453. doi: 10.1136/bmj.j3453

- 1
2
3 28. Gill M, Bagshaw SM, McKenzie E, et al. Patient and Family Member-Led Research in the
4 Intensive Care Unit: A Novel Approach to Patient-Centered Research. *PLoS One*
5 2016;11(8):e0160947. doi: 10.1371/journal.pone.0160947 [published Online First:
6 2016/08/06]
7
8 29. Krewulak KD, Sept BG, Stelfox HT, et al. Feasibility and acceptability of family administration
9 of delirium detection tools in the intensive care unit: a patient-oriented pilot study.
10 *CMAJ Open* 2019;7(2):E294-E99. doi: 10.9778/cmajo.20180123 [published Online First:
11 2019/04/28]
12
13 30. Graham ID, Logan J, Harrison MB, et al. Lost in knowledge translation: time for a map? *J*
14 *Contin Educ Health Prof* 2006;26(1):13-24. doi: 10.1002/chp.47 [published Online First:
15 2006/03/25]
16
17 31. Stern C, Lizarondo L, Carrier J, et al. Methodological guidance for the conduct of mixed
18 methods systematic reviews. *JBIM Evid Synth* 2020;18(10):2108-18. doi: 10.11124/jbisir-d-
19 19-00169
20
21 32. Ross DA, Hinton R, Melles-Brewer M, et al. Adolescent Well-Being: A Definition and
22 Conceptual Framework. *J Adolesc Health* 2020;67(4):472-76. doi:
23 10.1016/j.jadohealth.2020.06.042 [published Online First: 2020/08/18]
24
25 33. Schoonenboom J, Johnson RB. How to Construct a Mixed Methods Research Design. *Kolner Z*
26 *Sozpsychol* 2017;69(Suppl 2):107-31.
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Online Appendix 1. Database search for Ovid MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations and Daily <1946 to December 17, 2021>

1 COVID-19/ or SARS-CoV-2/ (128415)
 2 (coronavirus/ or betacoronavirus/ or coronavirus infections/) and (disease outbreaks/ or
 3 epidemics/ or pandemics/) (40074)
 4 (nCoV* or 2019nCoV or 19nCoV or COVID19* or COVID or SARS-COV-2 or SARSCOV-2 or
 5 SARS-COV2 or SARSCOV2 or SARS coronavirus 2 or Severe Acute Respiratory Syndrome
 6 Coronavirus 2 or Severe Acute Respiratory Syndrome Corona Virus 2).tw,kf. (200047)
 7 ((new or novel or "19" or "2019" or Wuhan or Hubei or China or Chinese) adj3 (coronavirus*
 8 or corona virus* or betacoronavirus* or CoV or HCoV)).tw,kf. (59516)
 9 (long COVID* or longCOVID* or postCOVID* or post-COVID* or postcoronavirus* or post-
 10 coronavirus* or postSARS* or post-SARS*).tw,kf. (3389)
 11 ((coronavirus* or corona virus* or betacoronavirus*) adj3 (pandemic* or epidemic* or
 12 outbreak* or crisis)).tw,kf. (10751)
 13 ((Wuhan or Hubei) adj5 pneumonia).tw,kf. (379)
 14 1 or 2 or 3 or 4 or 5 or 6 or 7 (211145)
 15 limit 8 to yr="2019 -Current" (209609)
 16 animals/ not humans/ (4898487)
 17 9 not 10 (208687)
 18 adolescent/ or child/ (2993554)
 19 (adolescen* or child or children or teen* or youth*).tw,kf. (1598134)
 20 12 or 13 (3534661)
 21 11 and 14 (18815)
 22 limit 11 to ("child (6 to 12 years)" or "adolescent (13 to 18 years)") (13144)
 23 15 or 16 (18815)
 24 ((parks or play or playground*) adj5 (cleaning or closure* or closed or distancing or
 25 restrict* or limit* or masks or masking or shutdown* or shut down*)).tw,kf. (2970)
 26 ((college* or school* or universit*) adj5 (cleaning or closed or closure* or distancing or
 27 interrupt* or lockdown* or limit* or masks or masking or restrict* or saniti* or shutdown* or
 28 shut down* or suspen* or ventilat* or (covid* adj2 test*) or (covid* adj2 vaccin*))).tw,kf. (5941)
 29 (in-person learning adj5 (interrupt* or limit* or restrict* or suspen*)).tw,kf. (5)
 30 home schooling.tw,kf. (64)
 31 ((at home or hybrid or online or remote) adj (educat* or learning)).tw,kf. (4621)
 32 ((extracurricular or extra-curricular or intramural or school* or weekend) adj5 (activities or
 33 clubs or hobbies or sports or team or athletes or groups)).tw,kf. (5779)
 34 18 or 19 or 20 or 21 or 22 or 23 (18956)
 35 17 and 24 (1000)
 36 limit 25 to (comment or editorial or letter) (49)
 37 25 not 26 (951)

Reporting checklist for protocol of a systematic review.

Based on the PRISMA-P guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

Upload your completed checklist as an extra file when you submit to a journal.

In your methods section, say that you used the PRISMA-Preporting guidelines, and cite them as:

Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart LA. Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) 2015 statement. *Syst Rev.* 2015;4(1):1.

		Reporting Item	Page Number
Title			
Identification	#1a	Identify the report as a protocol of a systematic review	1
Update	#1b	If the protocol is for an update of a previous systematic review, identify as such	n/a
Registration			
	#2	If registered, provide the name of the registry (such as PROSPERO) and registration number	n/a
Authors			
Contact	#3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	1-2
Contribution	#3b	Describe contributions of protocol authors and identify the guarantor of the review	3

1	Amendments		
2			
3			
4		#4	n/a
5		If the protocol represents an amendment of a previously completed	
6		or published protocol, identify as such and list changes; otherwise,	
7		state plan for documenting important protocol amendments	
8			
9	Support		
10			
11	Sources	#5a	3
12		Indicate sources of financial or other support for the review	
13	Sponsor	#5b	3
14		Provide name for the review funder and / or sponsor	
15	Role of sponsor or	#5c	3
16	funder	Describe roles of funder(s), sponsor(s), and / or institution(s), if	
17		any, in developing the protocol	
18			
19	Introduction		
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22	Rationale	#6	7
23		Describe the rationale for the review in the context of what is	
24		already known	
25	Objectives	#7	8
26		Provide an explicit statement of the question(s) the review will	
27		address with reference to participants, interventions, comparators,	
28		and outcomes (PICO)	
29			
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31	Methods		
32			
33	Eligibility criteria	#8	9-12;
34		Specify the study characteristics (such as PICO, study design,	Table 1
35		setting, time frame) and report characteristics (such as years	
36		considered, language, publication status) to be used as criteria for	
37		eligibility for the review	
38			
39			
40	Information	#9	12
41	sources	Describe all intended information sources (such as electronic	
42		databases, contact with study authors, trial registers or other grey	
43		literature sources) with planned dates of coverage	
44			
45	Search strategy	#10	13;
46		Present draft of search strategy to be used for at least one	Appendix
47		electronic database, including planned limits, such that it could be	1
48		repeated	
49			
50	Study records -	#11a	13
51	data management	Describe the mechanism(s) that will be used to manage records	
52		and data throughout the review	
53			
54	Study records -	#11b	13; Table
55	selection process	State the process that will be used for selecting studies (such as	2
56		two independent reviewers) through each phase of the review (that	
57		is, screening, eligibility and inclusion in meta-analysis)	
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1	Study records -	#11c	Describe planned method of extracting data from reports (such as	14-15;
2	data collection		piloting forms, done independently, in duplicate), any processes	Table 3
3	process		for obtaining and confirming data from investigators	
4				
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6	Data items	#12	List and define all variables for which data will be sought (such as	14; Table
7			PICO items, funding sources), any pre-planned data assumptions	3
8			and simplifications	
9				
10				
11	Outcomes and	#13	List and define all outcomes for which data will be sought,	15-16;
12	prioritization		including prioritization of main and additional outcomes, with	Table 4
13			rationale	
14				
15				
16	Risk of bias in	#14	Describe anticipated methods for assessing risk of bias of	n/a
17	individual studies		individual studies, including whether this will be done at the	
18			outcome or study level, or both; state how this information will be	
19			used in data synthesis	
20				
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22				
23	Data synthesis	#15a	Describe criteria under which study data will be quantitatively	15-16;
24			synthesised	Table 4
25				
26				
27	Data synthesis	#15b	If data are appropriate for quantitative synthesis, describe planned	15-16;
28			summary measures, methods of handling data and methods of	Table 4
29			combining data from studies, including any planned exploration of	
30			consistency (such as I ² , Kendall's τ)	
31				
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34	Data synthesis	#15c	Describe any proposed additional analyses (such as sensitivity or	15-16;
35			subgroup analyses, meta-regression)	Table 4
36				
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38	Data synthesis	#15d	If quantitative synthesis is not appropriate, describe the type of	n/a
39			summary planned	
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42	Meta-bias(es)	#16	Specify any planned assessment of meta-bias(es) (such as	n/a
43			publication bias across studies, selective reporting within studies)	
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46	Confidence in	#17	Describe how the strength of the body of evidence will be assessed	n/a
47	cumulative		(such as GRADE)	
48	evidence			
49				
50				

- 15c: 15-16; Table 5 The PRISMA-P checklist is distributed under the terms of the Creative Commons Attribution License CC-BY 4.0. This checklist was completed on 17. December 2020 using <https://www.goodreports.org/>, a tool made by the [EQUATOR Network](#) in collaboration with [Penelope.ai](#)

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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Secondary Subject Heading:	Paediatrics, Mental health, Health services research, Global health, Epidemiology
Keywords:	COVID-19, Community child health < PAEDIATRICS, Child & adolescent psychiatry < PSYCHIATRY, MENTAL HEALTH

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Manuscripts

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 (e.g., 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 categorize 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 operationalized 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 December 1, 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

1
2
3 Ethical approval is not applicable as this review will be conducted on published data. Findings of
4
5 this study will be disseminated at national and international conferences and will inform our
6
7 pan-Canadian multidisciplinary team of researchers, public, health professionals, and knowledge
8
9 users to co-design and pilot test a digital psychoeducational health tool—an interactive, web-
10
11 based tool to help Canadian youth and their families address poor mental wellbeing resulting
12
13 from and persisting beyond the COVID-19 pandemic.
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20 *Keywords*

21
22 Child; Youth; Well-Being; COVID-19; Pandemic; Impact
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25

26 *Strengths and limitations of this study*

- 27
28 • We will conduct a comprehensive literature search of multiple bibliographic databases
29
30 for literature on broad domains of child and youth well-being.
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32
- 33
34 • Our scoping review will follow the Arksey-O'Malley five-stage scoping review method
35
36 and will conform to the manual from the Joanna Briggs Institute.
37
38
- 39
40 • We will include all primary empirical and non-empirical record types that report novel
41
42 data on the broad range of strategies taken to mitigate potentially deleterious impacts
43
44 of the COVID-19 pandemic on children and/or youth, and their families if included.
45
46
- 47
48 • We anticipate extensive data searches given the rapid and continuous nature of COVID-
49
50 19 literature.
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54 • We foresee challenges related to accurately outlining the steps for completion and
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56 categorizing by type the strategies based on what is briefly reported in the published
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58 literature.
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For peer review only

Introduction

In March, 2020, the World Health Organization (WHO) declared the novel SARS-CoV-2 (COVID-19) disease outbreak 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 learned 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 (e.g., 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-*and* long-term effects on youth mental wellbeing.(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

1
2
3 wellbeing needs related to pandemic recovery. The first step is to understand the broad range
4
5 of strategies (e.g., digital tools for mental health) that have been taken to mitigate potentially
6
7 deleterious impacts of the COVID-19 pandemic (e.g., loneliness, isolation, illness) on the well-
8
9 being of children, youth, and their families, and subsequently translating findings into
10
11 actionable interventions to support recovery and resilience.
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18 We report a protocol for a scoping review designed to identify, describe, and categorize any
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20 strategy taken during the COVID-19 pandemic to address the impact of the COVID-19 pandemic
21
22 on child and youth well-being (including their families if data is presented). For the purposes of
23
24 this review, optimal well-being (including the domains of health and nutrition, connectedness,
25
26 safety and support, learning and competence, and agency and resilience(12)) is defined as when
27
28 “children and youth have the support, confidence, and resources to thrive in contexts of secure
29
30 and healthy relationships, realizing their full potential and rights.”(13) The results of our scoping
31
32 review will directly inform integrated knowledge translation interventions at the individual,
33
34 family unit, and health and education systems levels, to close the most important gaps in
35
36 recovery from pandemic events facing children, youth, and families.
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45 **Review questions**

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47 This scoping review will be conducted as per the Arksey-O’Malley five-stage scoping review
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49 method(14) and the Scoping Review Methods Manual by the Joanna Briggs Institute.(15) The
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51 Preferred Reporting Items for Systematic Reviews and Meta-analysis Protocols (PRISMA-P)
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3 guideline was used to develop the protocol.(16) We will adhere to the PRISMA-ScR Extension for
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5 Scoping Reviews to report findings from the completed scoping review.(17)
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10 The primary research question underpinning this scoping review is: What strategies have been
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12 taken to mitigate potentially deleterious impacts of the COVID-19 pandemic on child and youth
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14 well-being?
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20 The components of population, exposure, comparator, outcome, study design, and timeframe
21
22 are as follows:
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- 25 • Population: Children or youth (≤ 18 years, who may or may not have been infected with
26 COVID-19 previously) and their (immediate and extended) families (if presented).
27
- 28 • Exposure: Any strategies (i.e., interventions) including clinical, social, policy or political
29 (specific to children and youth) that have been taken to mitigate potentially deleterious
30 impacts (e.g., psychological, physical) of the COVID-19 pandemic.
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- 33 • Comparator: Any or no comparator will be accepted.
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- 36 • Outcomes: Any well-being outcome that will be operationalized according to pre-
37 established domains (health and nutrition, connectedness, safety and support, learning
38 and competence, and agency and resilience).(12)
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- 41 • Study design: Any empirical or non-empirical study, excluding protocols, reviews,
42 commentaries, editorials, opinions, case studies and case reports, book chapters and
43 dissertations. We will exclude publications in pre-print.
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- 46 • Timeframe: Publications from December 1, 2019, to present.
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Methods and analysis

Study designs eligible

We will include any published article that reports new (i.e., not previously published) findings including primary observational studies (e.g., cross-sectional [surveys], cohort, case-control studies), qualitative research, or interventional studies (e.g., randomized controlled trials, non-randomized 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 pre-print repositories (Table 1).

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 inquires	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 (i.e., intervention) to mitigate potentially deleterious impacts of the COVID-19 pandemic	The study does not report on a strategy (i.e., intervention) to mitigate potentially deleterious impacts of the COVID-19 pandemic
The study's outcome(s) are any well-being outcome that will be operationalized according to pre-established domains (health and nutrition, connectedness, safety and support, learning and competence, and agency and resilience)	The study's outcome(s) are not any well-being outcome that will be operationalized 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 December 1, 2019	The study was started before December 1, 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

Participant eligibility

Eligible study populations will include children and youth (hereafter referred to as youth and age defined as ≤ 18 years,(18) capturing the portion of children and youth in adolescence and emerging independence). Eligible studies do not need to include immediate (i.e., nuclear) or

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3 extended (i.e., relative) adult family members (>18 years of age, or as defined in the individual
4 study), though these studies will be included if other population criteria are met. If results for
5 child/youth-family dyads are reported in separate publications, we will include both studies. We
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7 will include both COVID-positive, COVID-negative, and unknown-COVID status children, youth
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9 and family members, and outcomes of these groups will be stratified by COVID status if
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11 reported. We will include studies that report on strategies that are or are not mediated by
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13 another individual (or group) in addition to the youth (or parent/guardian) (e.g., mental well-
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15 being approaches that are mediated through psychologists or occupational therapists, social
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17 well-being approaches that are mediated through school teachers).(19) This research builds on
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19 our funded national program of pandemic preparedness research to examine the knowledge,
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21 perceptions, behaviours, and associated impact of the pandemic and related restrictions on the
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23 Canadian public (aged 10 and older) to develop evidence-informed solutions to enhance
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25 pandemic recovery.
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34 35 36 37 *Exposure eligibility*

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39 The exposure is any strategies (i.e., interventions) that have been taken to mitigate potentially
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41 deleterious impacts of the COVID-19 pandemic on children and youth well-being. To manage
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43 the amount of literature retrieved, we will only include strategies that are specific to children
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45 and youth.
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52 *Outcome measure eligibility*

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3 The primary outcome is any well-being assessment that will be operationalized according to
4 pre-established domains (health and nutrition, connectedness, safety and support, learning and
5 competence, and agency and resilience).(12) All eligible studies will describe a strategy with
6 quantitative and/or qualitative (perspectives (i.e., views or prospects) or experiences (i.e.,
7 encounters)) results. As we expect outcome measures to vary and use different measurement
8 tools, we will not prespecify principal summary measures. We will not combine included studies
9 in meta-analyses given our desire to understand strategies and the association with well-being
10 outcomes and to interpret any potential variation.
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25 *Timeframe eligibility*

26 Eligible studies will be publications from December 1, 2019, to present. Search results will be
27 updated prior to manuscript submission.
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35 *Search strategy*

36 Articles in all languages for this review will be identified in CINAHL, Cochrane CENTRAL Register
37 of Controlled Trials, EMBASE, ERIC, Education Research Complete, MEDLINE, and APA PsycINFO.
38 The search strategies were developed by a librarian co-investigator in collaboration with other
39 members of the team.(20) A range of broad search terms will be used to maximize the yield of
40 the search for studies. Search terms were selected based on components of child and youth
41 well-being during the COVID-19 pandemic, and strategies, solutions, tools, and interventions.
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52 The full search strategy for all databases can be found in Online Appendix 1.
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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. (e.g., 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).

Table 2. Screening questions to identify literature for including 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 question to be used to identify literature to be included in the full-text screening process</i>			
Study design: Does the title/abstract describe an observational or interventional primary research study, including focus groups and qualitative inquires?	Yes: The study employs an observational or interventional primary research design, including focus groups and qualitative inquires.	No: The study is a protocol, review, commentary, editorial, opinion, case study, case report, thesis, pre-print, 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 inquires.
Publication type: 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.
Population: 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.
Exposure: 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?
Outcome: Does the title or abstract report on any well-being outcome(s) operationalized 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 operationalized 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 operationalized 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 operationalized according to pre-established domains (health and nutrition, connectedness, safety and support, learning and competence, and agency and resilience).
Screening domain and question	Characteristics for assessment		
	Yes—include	No—exclude	
<i>Full article screen questions to be used to identify literature for inclusion in the systematic review</i>			
<i>*full article screening questions include all screening domains and questions from title and abstract screening, and two additional domains</i>			
Timeframe: Was the strategy enacted on or after December 1, 2019?	Yes: The strategy was enacted on or after December 1, 2019.	No: The strategy was enacted before December 1, 2019.	
Setting: 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.	

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 impact of the COVID-19 pandemic will be summarized quantitatively, as well as qualitatively, in thematic analysis, for which the process is described below.

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

Data domain	Data categories
<u>Study identifiers</u> : From a published study.	Authors' names; study title; publication type; publication date; journal, volume, issue, and page numbers of publication; place of publication (i.e., first author's institutional email address); and digital object identifier
<u>Study design</u> : Primary research.	Study type or design; timeframe of study; location of study (i.e., country); and region of study (localized when reported)
<u>Participants</u> : Children and youth and (if reported) their family member or guardians	Definition and size (i.e., N) of the source population(s) at risk; relevant demographic information (e.g., age, sex, gender, ethnicity, grade in school, type of school, relationship to guardian if not parent)
<u>Exposure</u> : Any strategy implemented to mitigate potentially deleterious impacts of the COVID-19 pandemic on children or youth.	Strategy type, duration (if applicable), location (i.e., geographical); steps or guiding principles to conduct the strategy (e.g., elements, or a step-wise protocol); derivation of the strategy from empirical evidence (i.e., if derived from observation and experiment, or published theory); minimum expertise to conduct the strategy (i.e., whether additional personnel are required [e.g., social worker, psychiatrist]); limitations to the strategy (e.g., requirement of stable WiFi connection or personal device); reproducibility of the strategy (i.e., operationalized, evidenced by use in multiple settings); feasibility of the strategy to other contexts (i.e., generalizable, considering internal validity should precede external validity)
<u>Outcome</u> : Well-being outcomes operationalized 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 (e.g., standard deviation, interquartile range); statistical significance; authors' conclusions and recommendations; themes and subthemes including exemplary quotations from studies reporting qualitative findings

¹Data will be categorized according to the "Inform, Activate, Collaborate Framework" developed by our team

Data abstraction

A data abstraction form will be created in Microsoft Excel. The abstraction form will be piloted and tested by the data abstractors (SJMo, SJMi) on a subset of studies (i.e., 5% of studies if $n > 50$, 10% of studies if $n \leq 50$) to ensure clarity. Following pilot testing, the form will be adapted as recommended by the abstractors to improve usability and completeness. The first author (SJMo) and one additional abstractor (SJMi) 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 is unclear, missing, or presented in a format that is unusable or cannot be abstracted, we will attempt to contact corresponding authors for clarification. We will contact authors via email, and a follow-up email will be sent 2-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

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3 integration with qualitative data.(21) These textual descriptions will be assembled and pooled
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5 with qualitative data, extracted directly from the included qualitative studies. Categories of
6
7 pooled data will be aggregated to produce the overall findings of the review.
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10 11 12 *Presentation of the results*

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15 The final search strategy for each database and all ancillary searches conducted will be provided
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17 as an appendix in the final publication. A flow chart, following the PRISMA-ScR Extension for
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19 Scoping Reviews,(17) will illustrate where citations were eliminated during screening and
20
21 ancillary searches, including rationale for exclusion in full-text screening. All included studies will
22
23 be presented in a narrative synthesis. A table of characteristics of included studies will be
24
25 included in the published journal article and will describe study identifiers and period of study,
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27 sample and setting, strategy, direction and magnitude of the outcome, and authors' conclusions
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29 and recommendations. Descriptive statistics will be provided as extensions of this table when
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31 appropriate or in the narrative synthesis. Results from our convergent integrated approach to
32
33 data synthesis will be presented as a separate table and summarized narratively in the results.
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42 We will utilize the “Inform, Activate, Collaborate Framework” developed by our team(22) to
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44 categorize the strategies that we identify in our review to present a catalogue of strategies with
45
46 the ultimate goals to: (1) inform the global community of pandemic policies and stressors most
47
48 impacting youth and families; (2) activate progressive youth and family participation for
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50 increased understanding and promotion of positive behaviours to wellbeing; and (3) foster
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52 collaboration between community members, educators, researchers, youth and family
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3 organizations, decision makers, and health professionals in regards to pandemic policies and
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5 their impact on youth and family wellbeing. Wellbeing outcomes measures will be categorized
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7 according to the framework for child and youth wellbeing, including the domains of health,
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9 connectedness, safety, learning, and agency.(12)
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15 *Patient and public involvement*

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17 Youth-engaged research gives us the opportunity to learn from youth about how social
18
19 systems—like families, schools and communities—and systemic inequities impact their
20
21 experiences and outcomes.(23) The proposed review will abide by the CIHR-guiding core
22
23 principles of inclusiveness, mutual respect, support, and co-building.(24) We will adhere to the
24
25 GRIPP-2 reporting guidelines for patient and public involvement.(25) Youth involvement (herein
26
27 referred to as knowledge users) was considered in priority setting discussions and group
28
29 consultations. These knowledge users (SS, MH) were involved in protocol development and will
30
31 continue to be involved in the project through to and including dissemination of the published
32
33 report and implementation of the evidence-informed recommendations. Our multidisciplinary
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35 team of knowledge users, researchers, and healthcare providers (e.g., physician, psychologist)
36
37 have established a track record of co-leading national peer-reviewed grants and research
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39 success in publishing with knowledge users.(26, 27)
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50 *Knowledge translation plan*

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52 We will use an integrated knowledge translation approach through the inclusion of knowledge
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54 users (i.e., youth and family members, and multidisciplinary healthcare providers). The
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underpinning knowledge translation framework for this work will be Graham's Knowledge-to-Action (KTA) framework.(28) 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 team(22) for continuity with knowledge users and stakeholder groups. This will allow the opportunity to elicit generalizable findings that can directly inform practice and policy decisions related to youth during COVID-19, and for future pandemics.

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 (e.g., social media, blogs)
An in-depth synthesis and comparison of results and insights on strategies, including categorization 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.

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 organization decision makers) to co-design and pilot test a digital psychoeducational health tool—an interactive, web-based tool to help Canadian youth and their families address poor mental wellbeing 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 method systematic reviews, as described by the Joanna Briggs Institute,(29) our results will rapidly provide evidence to inform the development of adaptable youth interventions, related policies, and decision-making at both government and organizational levels during the current and future public health crises.

1
2
3 There is presently no comprehensive synthesis of available research on strategies to mitigate
4 potentially deleterious impacts of the COVID-19 pandemic on youth, and their families. To
5
6 develop this synthesis, a bibliography of strategies and associated outcomes is needed. We aim
7
8 to develop a catalogue of strategies according to the five domains of youth well-being,(30) as
9
10 well as the level of engagement (i.e., inform, activate, collaborate) necessary for the strategy to
11
12 have a desirable effect. This catalogue will provide a systematic process for policy makers to
13
14 make informed decisions about which strategy is the most appropriate to address and mitigate
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16 potentially negative impacts from the COVID-19 pandemic, that will directly inform practice and
17
18 policy decisions.
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28 Our work will help to identify gaps in the literature where primary evidence is needed. We
29
30 anticipate that this scoping review will lead to several subsequent systematic reviews. For
31
32 example, one future systematic review may focus on mental health interventions to increase
33
34 youth connectedness. We also expect that this review may inform future studies on effective
35
36 well-being interventions and psychological strategies for youth and their families impacted by
37
38 COVID-19, that will enhance the extent and quality of the research evidence base.
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45 Finally, this review will directly inform a sequential explanatory mixed methods design(31) study
46
47 that involves three intersecting phases of work anchored conceptually to the five domains of
48
49 youth well-being, as our pan-Canadian multidisciplinary team of researchers, public (youth and
50
51 family partners), health professionals, and knowledge users (healthcare and non-governmental
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53 organization decision makers) who will co-design and pilot test a digital psychoeducational
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3 health tool—an interactive, web-based tool to help Canadian youth and their families address
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5 poor mental wellbeing resulting from and persisting beyond the COVID-19 pandemic. The
6
7 overarching goal of our work is to partner with youth and families by engaging around
8
9 pandemic experiences and recovery needs, educating on best available resources, and
10
11 empowering involvement in the development of targeted resources that support recovery and
12
13 resilience.
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20 *Anticipated challenges*

21
22 The potential benefits of this scoping review must be studied considering possible challenges.
23
24 We foresee that the yield of the literature searches might be extensive, given the rapid and
25
26 continuous nature of the publication of COVID-19 research in journals. We also anticipate
27
28 challenges related to outlining strategies accurately based on the published record. However,
29
30 we have a strong and diverse team that has extensive experience with knowledge synthesis and
31
32 therefore has the experience and expertise to address these challenges.
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Contributors

All those designated as authors have met all ICMJE criteria for authorship.

1. Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
2. Drafting the work or revising it critically for important intellectual content; AND
3. Final approval of the version to be published; AND
4. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

JPL, KMF, HTS applied for and received funding.

SJMo, SJMi, MCA, JPL are the core team leading the systematic review.

SJMo and JPL drafted the initial manuscript for the protocol.

SJMo, DLL, EAF, SS, MH, PRT, KAB, MCS, SJMi, HTS, KMF provided advice at different stages during drafting of the protocol manuscript.

SJMo, DLL, EAF, SS, MH, PRT, KAB, MCS, SJMi, HTS, KMF approved the initial version of the manuscript that was submitted.

SJMo and JPL revised the manuscript following peer-review.

SJMo, DLL, EAF, SS, MH, PRT, KAB, MCS, SJMi, HTS, KMF approved the final version of the revised manuscript that was submitted.

JPL is the guarantor and attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

SJMo and JPL affirm that this manuscript is an honest, accurate, and transparent account of the study that will be reported; that no important aspects of the study will be omitted; and that any discrepancies from the study as planned (and described in the protocol) will be explained.

Competing interests

The authors report no competing interests, financial or otherwise.

References

1. World Health Organization: Rolling updates on coronavirus disease (COVID-19). Available at: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen>. Accessed April 12, 2020
2. Government of Canada: Coronavirus disease (COVID-19): Guidance documents. Available at: <https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/guidance-documents.html>. Accessed April 8, 2021
3. Peek L: Children and Disasters: Understanding Vulnerability, Developing Capacities, and Promoting Resilience; An Introduction. *Children, Youth and Environments* 2008; 18(1):1-29
4. Hawke LD, Barbic SP, Voineskos A, Szatmari P, et al: Impacts of COVID-19 on Youth Mental Health, Substance Use, and Well-being: A Rapid Survey of Clinical and Community Samples. *Can J Psychiatry* 2020; 65(10):701-709
5. Magson NR, Freeman JYA, Rapee RM, Richardson CE, et al: Risk and Protective Factors for Prospective Changes in Adolescent Mental Health during the COVID-19 Pandemic. *J Youth Adolesc* 2021; 50(1):44-57
6. Chaabane S, Doraiswamy S, Chaabna K, Mamtani R, et al: The Impact of COVID-19 School Closure on Child and Adolescent Health: A Rapid Systematic Review. *Children (Basel)* 2021; 8(5)
7. Roos LE, Salisbury M, Penner-Goeke L, Cameron EE, et al: Supporting families to protect child health: Parenting quality and household needs during the COVID-19 pandemic. *PLoS One* 2021; 16(5):e0251720
8. Cost KT, Crosbie J, Anagnostou E, Birken CS, et al: Mostly worse, occasionally better: impact of COVID-19 pandemic on the mental health of Canadian children and adolescents. *Eur Child Adolesc Psychiatry* 2021
9. Racine N, Korczak DJ, Madigan S: Evidence suggests children are being left behind in COVID-19 mental health research. *European child & adolescent psychiatry* 2020:1-2
10. Marques de Miranda D, da Silva Athanasio B, Sena Oliveira AC, Simoes-e-Silva AC: How is COVID-19 pandemic impacting mental health of children and adolescents? *International Journal of Disaster Risk Reduction* 2020; 51:101845
11. Silliman Cohen RI, Bosk EA: Vulnerable Youth and the COVID-19 Pandemic. *Pediatrics* 2020; 146(1):e20201306
12. Ross DA, Hinton R, Melles-Brewer M, Engel D, et al: Adolescent Well-Being: A Definition and Conceptual Framework. *J Adolesc Health* 2020; 67(4):472-476
13. Ross DA, Hinton R, Melles-Brewer M, Engel D, et al: Adolescent Well-Being: A Definition and Conceptual Framework. *Journal of Adolescent Health* 2020; 67(4):472-476
14. Arksey H: Scoping the field: services for carers of people with mental health problems. *Health Soc Care Community* 2003; 11(4):335-344
15. Joanna Briggs I: The Joanna Briggs Institute best practice information sheet: the effectiveness of pelvic floor muscle exercises on urinary incontinence in women following childbirth. *Nurs Health Sci* 2011; 13(3):378-381
16. Moher D, Shamseer L, Clarke M, Ghersi D, et al: Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Syst Rev* 2015; 4:1
17. Tricco AC, Lillie E, Zarin W, O'Brien KK, et al: PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med* 2018; 169(7):467-473

18. World Health Organization: Adolescent Health. Available at: <https://www.who.int/health-topics/adolescent-health>. Accessed July 20, 2021,
19. Colao A, Piscitelli P, Pulimeno M, Colazzo S, et al: Rethinking the role of the school after COVID-19. *The Lancet Public Health* 2020; 5(7):e370
20. McGowan J, Sampson M, Salzwedel DM, Cogo E, et al: PRESS Peer Review of Electronic Search Strategies: 2015 Guideline Statement. *J Clin Epidemiol* 2016; 75:40-46
21. Thomas J, Harden A: Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Med Res Methodol* 2008; 8:45
22. Fiest KM, McIntosh CJ, Demianschuk D, Leigh JP, et al: Translating evidence to patient care through caregivers: a systematic review of caregiver-mediated interventions. *BMC Med* 2018; 16(1):105
23. Lowrie E, Tyrrell-Smith R: Using a Community-Engaged Research (CEnR) approach to develop and pilot a photo grid method to gain insights into early child health and development in a socio-economic disadvantaged community. *Res Involv Engagem* 2017; 3:29
24. Strategy for Patient-Oriented Research- Patient Engagement Framework 2019. Canadian Institutes of Health Research, 2019.
25. Staniszewska S, Brett J, Simera I, Seers K, et al: GRIPP2 reporting checklists: tools to improve reporting of patient and public involvement in research. *BMJ* 2017; 358:j3453
26. Gill M, Bagshaw SM, McKenzie E, Oxland P, et al: Patient and Family Member-Led Research in the Intensive Care Unit: A Novel Approach to Patient-Centered Research. *PLoS One* 2016; 11(8):e0160947
27. Krewulak KD, Sept BG, Stelfox HT, Ely EW, et al: Feasibility and acceptability of family administration of delirium detection tools in the intensive care unit: a patient-oriented pilot study. *CMAJ Open* 2019; 7(2):E294-E299
28. Graham ID, Logan J, Harrison MB, Straus SE, et al: Lost in knowledge translation: time for a map? *J Contin Educ Health Prof* 2006; 26(1):13-24
29. Stern C, Lizarondo L, Carrier J, Godfrey C, et al: Methodological guidance for the conduct of mixed methods systematic reviews. *JBI Evid Synth* 2020; 18(10):2108-2118
30. Ross DA, Hinton R, Melles-Brewer M, Engel D, et al: Adolescent Well-Being: A Definition and Conceptual Framework. *J Adolesc Health* 2020; 67(4):472-476
31. Schoonenboom J, Johnson RB: How to Construct a Mixed Methods Research Design. *Kolner Z Soz Sozpsychol* 2017; 69(Suppl 2):107-131

MEDLINE

1 COVID-19/ or SARS-CoV-2/
 2 (coronavirus/ or betacoronavirus/ or coronavirus infections/) and (disease outbreaks/ or epidemics/ or
 3 pandemics/
 4 (nCoV* or 2019nCoV or 19nCoV or COVID19* or COVID or SARS-COV-2 or SARSCOV-2 or SARS-COV2 or
 5 SARSCOV2 or SARS coronavirus 2 or Severe Acute Respiratory Syndrome Coronavirus 2 or Severe Acute Respiratory
 6 Syndrome Corona Virus 2).tw,kf.
 7 ((new or novel or "19" or "2019" or Wuhan or Hubei or China or Chinese) adj3 (coronavirus* or corona virus* or
 8 betacoronavirus* or CoV or HCoV)).tw,kf.
 9 (long COVID* or longCOVID* or postCOVID* or post-COVID* or postcoronavirus* or post-coronavirus* or
 10 postSARS* or post-SARS*).tw,kf.
 11 ((coronavirus* or corona virus* or betacoronavirus*) adj3 (pandemic* or epidemic* or outbreak* or
 12 crisis)).tw,kf.
 13 ((Wuhan or Hubei) adj5 pneumonia).tw,kf.
 14 1 or 2 or 3 or 4 or 5 or 6 or 7
 15 limit 8 to yr="2019 -Current"
 16 animals/ not humans/
 17 9 not 10
 18 adolescent/ or child/
 19 (adolescen* or child or children or teen* or youth*).tw,kf.
 20 12 or 13
 21 11 and 14
 22 limit 11 to ("child (6 to 12 years)" or "adolescent (13 to 18 years)")
 23 15 or 16
 24 ((parks or play or playground*) adj5 (cleaning or closure* or closed or distancing or restrict* or limit* or masks
 25 or masking or shutdown* or shut down*).tw,kf.
 26 ((college* or school* or universit*) adj5 (cleaning or closed or closure* or distancing or interrupt* or
 27 lockdown* or limit* or masks or masking or restrict* or saniti* or shutdown* or shut down* or suspen* or ventilat*
 28 or (covid* adj2 test*) or (covid* adj2 vaccin*))).tw,kf.
 29 (in-person learning adj5 (interrupt* or limit* or restrict* or suspen*)).tw,kf.
 30 home schooling.tw,kf.
 31 ((at home or hybrid or online or remote) adj (educat* or learning)).tw,kf.
 32 ((extracurricular or extra-curricular or intramural or school* or weekend) adj5 (activities or clubs or hobbies or
 33 sports or team or athletes or groups)).tw,kf.
 34 18 or 19 or 20 or 21 or 22 or 23
 35 17 and 24
 36 limit 25 to (comment or editorial or letter)
 37 25 not 26

EMBASE

1 COVID-19/ or SARS-CoV-2/
 2 (coronavirus/ or betacoronavirus/ or coronavirus infections/) and (disease outbreaks/ or epidemics/ or
 3 pandemics/
 4 (nCoV* or 2019nCoV or 19nCoV or COVID19* or COVID or SARS-COV-2 or SARSCOV-2 or SARS-COV2 or
 5 SARSCOV2 or SARS coronavirus 2 or Severe Acute Respiratory Syndrome Coronavirus 2 or Severe Acute Respiratory
 6 Syndrome Corona Virus 2).tw,kf.
 7 ((new or novel or "19" or "2019" or Wuhan or Hubei or China or Chinese) adj3 (coronavirus* or corona virus* or
 8 betacoronavirus* or CoV or HCoV)).tw,kf.
 9 (long COVID* or longCOVID* or postCOVID* or post-COVID* or postcoronavirus* or post-coronavirus* or
 10 postSARS* or post-SARS*).tw,kf.
 11 ((coronavirus* or corona virus* or betacoronavirus*) adj3 (pandemic* or epidemic* or outbreak* or
 12 crisis)).tw,kf.
 13 ((Wuhan or Hubei) adj5 pneumonia).tw,kf.
 14 1 or 2 or 3 or 4 or 5 or 6 or 7
 15 limit 8 to yr="2019 -Current"
 16 animals/ not humans/
 17 9 not 10
 18 adolescent/ or child/
 19 (adolescen* or child or children or teen* or youth*).tw,kf.
 20 12 or 13
 21 11 and 14
 22 limit 11 to ("child (6 to 12 years)" or "adolescent (13 to 18 years)")
 23 15 or 16
 24 ((parks or play or playground*) adj5 (cleaning or closure* or closed or distancing or restrict* or limit* or masks
 25 or masking or shutdown* or shut down*)).tw,kf.
 26 ((college* or school* or universit*) adj5 (cleaning or closed or closure* or distancing or interrupt* or
 27 lockdown* or limit* or masks or masking or restrict* or saniti* or shutdown* or shut down* or suspen* or ventilat*
 28 or (covid* adj2 test*) or (covid* adj2 vaccin*))).tw,kf.
 29 (in-person learning adj5 (interrupt* or limit* or restrict* or suspen*)).tw,kf.
 30 home schooling.tw,kf.
 31 ((at home or hybrid or online or remote) adj (educat* or learning)).tw,kf.
 32 ((extracurricular or extra-curricular or intramural or school* or weekend) adj5 (activities or clubs or hobbies or
 33 sports or team or athletes or groups)).tw,kf.
 34 18 or 19 or 20 or 21 or 22 or 23
 35 17 and 24
 36 limit 25 to (comment or editorial or letter)
 37 25 not 26

PsychINFO

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

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3 19 TI ((in-person learning N5 (interrupt* or limit* or restrict* or suspen*))) OR AB ((in-person learning N5
4 (interrupt* or limit* or restrict* or suspen*))) OR KW ((in-person learning N5 (interrupt* or limit* or
5 restrict* or suspen*)))
6 20 TI home schooling OR AB home schooling OR KW home schooling
7 21 TI (((at home or hybrid or online or remote) N1 (educat* or learning))) OR AB (((at home or hybrid or
8 online or remote) N1 (educat* or learning))) OR KW (((at home or hybrid or online or remote) N1
9 (educat* or learning)))
10 22 TI (((extracurricular or extra-curricular or intramural or school* or weekend) N5 (activities or clubs or
11 hobbies or sports or team or athletes or groups))) OR AB (((extracurricular or extra-curricular or
12 intramural or school* or weekend) N5 (activities or clubs or hobbies or sports or team or athletes or
13 groups))) OR KW (((extracurricular or extra-curricular or intramural or school* or weekend) N5 (activities
14 or clubs or hobbies or sports or team or athletes or groups)))
15 23 S17 OR S18 OR S19 OR S20 OR S21 OR S22
16 24 S16 AND S23
17 25 S16 AND S23
18 26 S24 NOT S25
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Cochrane Central

- 1 [mh ^COVID-19]
- 2 [mh ^SARS-CoV-2]
- 3 (coronavirus or betacoronavirus or coronavirus infections) and (disease outbreaks or epidemics or
- 4 pandemics)
- 5 (nCoV* or 2019nCoV or 19nCoV or COVID19* or COVID or SARS-COV-2 or SARSCOV-2 or SARS-COV2 or
- 6 SARSCOV2 or SARS coronavirus 2 or Severe Acute Respiratory Syndrome Coronavirus 2 or Severe Acute
- 7 Respiratory Syndrome Corona Virus 2):ti,ab,kw
- 8 ((new or novel or "19" or "2019" or Wuhan or Hubei or China or Chinese) NEAR/3 (coronavirus* or corona
- 9 virus* or betacoronavirus* or CoV or HCoV)):ti,ab,kw
- 10 (long COVID* or longCOVID* or postCOVID* or post-COVID* or postcoronavirus* or post-coronavirus* or
- 11 postSARS* or post-SARS*):ti,ab,kw
- 12 ((coronavirus* or corona virus* or betacoronavirus*) NEAR/3 (pandemic* or epidemic* or outbreak* or
- 13 crisis)):ti,ab,kw
- 14 ((Wuhan or Hubei) NEAR/5 pneumonia):ti,ab,kw
- 15 #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8
- 16 animals NOT humans
- 17 #9 NOT #10
- 18 [mh ^adolescent]
- 19 [mh ^child]
- 20 (adolescenc* or child or children or teen* or youth*):ti,ab,kw
- 21 #12 OR #13 OR #14
- 22 [mh ^adult]
- 23 #15 NOT #16
- 24 #11 AND #17
- 25 ((parks or play or playground*) NEAR/5 (cleaning or closure* or closed or distancing or restrict* or limit*
- 26 or masks or masking or shutdown* or shut down*)):ti,ab,kw
- 27 ((college* or school* or universit*) NEAR/5 (cleaning or closed or closure* or distancing or interrupt* or
- 28 lockdown* or limit* or masks or masking or restrict* or saniti* or shutdown* or shut down* or suspen* or
- 29 ventilat* or (covid* NEAR/2 test*) or (covid* NEAR/2 vaccin*)):ti,ab,kw
- 30 ((in-person learning NEAR/5 (interrupt* or limit* or restrict* or suspen*)):ti,ab,kw
- 31 (home schooling):ti,ab,kw
- 32 (((at home or hybrid or online or remote) NEAR/1 (educat* or learning)):ti,ab,kw
- 33 ((extracurricular or extra-curricular or intramural or school* or weekend) NEAR/5 (activities or clubs or
- 34 hobbies or sports or team or athletes or groups)):ti,ab,kw
- 35 #19 OR #20 OR #21 OR #22 OR #23 OR #24
- 36 #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(adolescen* OR preadolescen* OR (early NEAR/1 adolescen*) child* OR teen* or youth*) OR if(adolescen* OR preadolescen* 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 shutdown*)) 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 shutdown*))

CINAHL

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

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3 19 TI ((in-person learning N5 (interrupt* or limit* or restrict* or suspen*))) OR AB ((in-person learning N5
4 (interrupt* or limit* or restrict* or suspen*))) OR MW ((in-person learning N5 (interrupt* or limit* or
5 restrict* or suspen*)))
6 20 TI home schooling OR AB home schooling OR KW home schooling
7 21 TI (((at home or hybrid or online or remote) N1 (educat* or learning))) OR AB (((at home or hybrid or
8 online or remote) N1 (educat* or learning))) OR MW (((at home or hybrid or online or remote) N1
9 (educat* or learning)))
10 22 TI (((extracurricular or extra-curricular or intramural or school* or weekend) N5 (activities or clubs or
11 hobbies or sports or team or athletes or groups))) OR AB (((extracurricular or extra-curricular or
12 intramural or school* or weekend) N5 (activities or clubs or hobbies or sports or team or athletes or
13 groups))) OR MW (((extracurricular or extra-curricular or intramural or school* or weekend) N5 (activities
14 or clubs or hobbies or sports or team or athletes or groups)))
15 23 S17 OR S18 OR S19 OR S20 OR S21 OR S22
16 24 S16 AND S23
17 25 S16 AND S23
18 26 S24 NOT S25
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Reporting checklist for protocol of a systematic review.

Based on the PRISMA-P guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

Upload your completed checklist as an extra file when you submit to a journal.

In your methods section, say that you used the PRISMA-Preporting guidelines, and cite them as:

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		Reporting Item	Page Number
Title			
Identification	#1a	Identify the report as a protocol of a systematic review	1
Update	#1b	If the protocol is for an update of a previous systematic review, identify as such	n/a
Registration			
	#2	If registered, provide the name of the registry (such as PROSPERO) and registration number	n/a
Authors			
Contact	#3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	1-2
Contribution	#3b	Describe contributions of protocol authors and identify the guarantor of the review	3

Amendments

[#4](#) If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments n/a

Support

Sources [#5a](#) Indicate sources of financial or other support for the review 3

Sponsor [#5b](#) Provide name for the review funder and / or sponsor 3

Role of sponsor or funder [#5c](#) Describe roles of funder(s), sponsor(s), and / or institution(s), if any, in developing the protocol 3

Introduction

Rationale [#6](#) Describe the rationale for the review in the context of what is already known 7

Objectives [#7](#) Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO) 8

Methods

Eligibility criteria [#8](#) Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review 9-12; Table 1

Information sources [#9](#) Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage 12

Search strategy [#10](#) Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated 13; Appendix 1

Study records - data management [#11a](#) Describe the mechanism(s) that will be used to manage records and data throughout the review 13

Study records - selection process [#11b](#) State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis) 13; Table 2

1	Study records -	#11c	Describe planned method of extracting data from reports (such as	14-15;
2	data collection		piloting forms, done independently, in duplicate), any processes	Table 3
3	process		for obtaining and confirming data from investigators	
4				
5				
6	Data items	#12	List and define all variables for which data will be sought (such as	14; Table
7			PICO items, funding sources), any pre-planned data assumptions	3
8			and simplifications	
9				
10				
11	Outcomes and	#13	List and define all outcomes for which data will be sought,	15-16;
12	prioritization		including prioritization of main and additional outcomes, with	Table 4
13			rationale	
14				
15				
16	Risk of bias in	#14	Describe anticipated methods for assessing risk of bias of	n/a
17	individual studies		individual studies, including whether this will be done at the	
18			outcome or study level, or both; state how this information will be	
19			used in data synthesis	
20				
21				
22				
23	Data synthesis	#15a	Describe criteria under which study data will be quantitatively	15-16;
24			synthesised	Table 4
25				
26				
27	Data synthesis	#15b	If data are appropriate for quantitative synthesis, describe planned	15-16;
28			summary measures, methods of handling data and methods of	Table 4
29			combining data from studies, including any planned exploration of	
30			consistency (such as I ² , Kendall's τ)	
31				
32				
33				
34	Data synthesis	#15c	Describe any proposed additional analyses (such as sensitivity or	15-16;
35			subgroup analyses, meta-regression)	Table 4
36				
37				
38	Data synthesis	#15d	If quantitative synthesis is not appropriate, describe the type of	n/a
39			summary planned	
40				
41				
42	Meta-bias(es)	#16	Specify any planned assessment of meta-bias(es) (such as	n/a
43			publication bias across studies, selective reporting within studies)	
44				
45				
46	Confidence in	#17	Describe how the strength of the body of evidence will be assessed	n/a
47	cumulative		(such as GRADE)	
48	evidence			
49				
50				

- 15c: 15-16; Table 5 The PRISMA-P checklist is distributed under the terms of the Creative Commons Attribution License CC-BY 4.0. This checklist was completed on 17. December 2020 using <https://www.goodreports.org/>, a tool made by the [EQUATOR Network](#) in collaboration with [Penelope.ai](#)