

Rapid evidence and gap map of virtual care solutions for youth and families to mitigate the impact of the COVID-19 pandemic on pain, mental health, and substance use

CIHR Knowledge Synthesis: COVID-19 in Mental Health and Substance Use

Knowledge Synthesis Report 2

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In partnership with:

- Solutions for Kids in Pain (SKIP)
- PainBC
- Canadian Foundation for Healthcare Improvement (CFHI)

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Phase 1: Rapid systematic review of recommendations for virtual care best practices

The COVID-19 pandemic is challenging the mental and physical health of everyone, but particularly our youth. These impacts will be long-lasting. The extreme and prolonged stress experienced by youth today will set the stage for their mental and physical health well into adulthood. To prevent this, youth need early intervention now.

One of the most common impacts of extreme stressors and traumatic events in youth is pain. Stress can manifest in physical pain, particularly early in development¹⁻³. Critical to the COVID-19 pandemic are emerging reports of increased pain (headaches, stomachaches) amongst Italian and Spanish youth when surveyed about the effects of quarantine⁴. This finding parallels increases in new onset pain amongst youth following other traumatic experiences. When surveyed 5-8 months following Hurricane Katrina, 11-25% of youth reported new onset headaches, back, joint, and/or limb pain⁵. Left untreated, these pains will likely become chronic⁶. This is an urgent public health threat as chronic pain (pain lasting >3 months) already affects 1 in 5 Canadian youth⁷, costs >\$19 billion USD/year^{8,9}, and negatively impacts families¹⁰⁻¹². Given extreme and prolonged stress of COVID-19, coupled with social isolation and reduced access to care, prevalence rates will rise.

Chronic pain in youth is tied to mental health and substance use into adulthood. Youth with chronic pain experience PTSD, anxiety, depression, and insomnia at much higher rates than their peers^{13,14}, with associated substance use (opioids, marijuana)¹⁵⁻¹⁷. Longitudinal studies provide compelling evidence that chronic pain in childhood heightens risk for internalizing mental health disorders (PTSD, anxiety, depression¹⁸), opioid misuse¹⁹, and chronic pain^{6,20} into adulthood. The undertreatment of pain is a major contributor to the opioid crisis²¹. Youth are a part of this opioid crisis²².

Early virtual treatment of pain in youth during the COVID-19 pandemic is critical to prevent mental health issues into adulthood. Overnight, virtual care has become imperative. Research focused on youth and evidence-based virtual delivery of clinics and resources are identified mental health priorities for the COVID-19 pandemic²³. Without adequate pain relief and access to care, youth experience deteriorated mental health and functioning^{24,25}, and are at risk for substance misuse^{15,26}. Poor access to care and mental health were identified amongst the Top 10 patient-oriented research priorities for youth with chronic pain in Canada²⁷. COVID-19 has exacerbated these concerns with closure of clinics and therapies^{25,28,29}. Evidence-based and emerging virtual treatments (apps, online modules, telehealth clinics) exist to improve pain and mental health in youth and their parents, but implementation is sparse^{25,30-32}. Our health system must be nimble to respond virtually to levels of individual need, while at reduced capacity.

Stepped care models ensure that youth with pre-existing and new onset pain during COVID-19 and their parents receive intervention tailored to their individual needs. Using a resiliency-based approach, interventions in the 5-step model increase in time and resource intensity to support the population (step 1) up to specialist care (step 5), and can include: educational material, peer support, self-directed, group, or individual treatment³⁴. Stepped care is endorsed by the Mental Health Commission of Canada³³, and is well-suited for addressing the expected surge of youth mental health needs post-disaster³⁴.

Evidence and gap maps (EGMs) provide a novel knowledge synthesis approach that can accelerate uptake of virtual stepped care solutions for youth. At this critical time, knowledge syntheses must enable rapid informed decision-making by key stakeholders (patients/families, healthcare providers, policy-makers) and consider both existing evidence and newly-developed interventions in response to COVID-19. EGMs are ideal as they provide an interactive visual overview of the breadth, availability, and quality of evidence³⁵⁻³⁸, and have been created by our team³⁹. The EGM visual summary provides an accessible and usable synthesis of knowledge strengths and gaps to inform practice, policy, research, or

investment^{35,37}. Systematically mapping evidence for virtual care solutions for pain, mental health, and substance use in youth with pre-existing and new onset pain across the stepped care model will enable prevention, early intervention, and treatment during this phase of the COVID-19 pandemic and beyond.

Objectives

- (1) To identify recommendations for virtual care best practices for pain, mental health, substance use, and functioning for youth <18 years old with pre-existing and new onset pain, and their families (*Phase 1 – reported herein*).
- (2) To identify virtual care solutions to improve pain, mental health, substance use, and functioning for youth <18 years old with pre-existing and new onset pain, and their families (*Phase 2 – ongoing*).
- (3) To create an evidence and gap map to guide multi-sectoral stakeholders regarding virtual stepped care solutions to improve pain, mental health, substance use, and functioning for youth <18 years old with pre-existing and new onset pain, and their families during the COVID-19 pandemic and beyond (*Phase 2 – ongoing*).

Methods

This mixed-methods knowledge synthesis uses a phased approach to ensure findings are disseminated rapidly. Frameworks for rigorous conduct of rapid systematic, scoping reviews, and EGMs are followed^{35,36,40–43}, including: (1) identify research question; (2) identify relevant sources (e.g., eligibility and search); (3) screening and selection; (4) data extraction (e.g., outcomes, quality rating); (5) synthesis; and (6) consultation with stakeholders. The PRISMA Checklist guides quality reporting at each phase^{44,45}.

Phase 1 Methods

This rapid systematic review protocol has been submitted to PROSPERO for registration.

1.1 Eligibility Criteria, Search Strategy, and Conduct

English language peer-reviewed scientific articles published in the last 10 years were identified for inclusion if they: (1) focused on youth <18 years old reporting chronic pain; (3) addressed pain, mental health, substance use; (4) focused on any type of virtual care (e.g., telehealth, telemedicine, mhealth, ehealth, online, digital); and (5) reported on guidelines, best practices, considerations, and/or recommendations for care. Primary studies evaluating virtual care are excluded (covered in Phase 2). The search strategy was developed in collaboration with a health information specialist team member. Database searches were conducted in Medline, CINAHL, Embase, PsycINFO, and Web of Science the week of May 25th, 2020.

1.2 Screening and Selection

Two team members screened all abstracts and subsequent full-text studies for eligibility, in duplicate using Covidence⁴⁶. Disagreements were resolved by consensus.

1.3 Data Extraction and Synthesis

Data extraction was done independently by two team members with disagreements resolved through consensus. Extracted data included: author; publication year; article type; and type(s) of virtual care; key concepts, recommendations, or guidelines identified for virtual care and their relevance to level(s) of stepped care (steps 1-5)³³. Stepped care levels were coded as:

- *Level 1*: whole population (online self-help [e.g., apps, educational websites])
- *Level 2*: low needs (real-time peer support)
- *Level 3*: moderate needs (real-time psychoeducational workshop, expert-assisted e-supports [via app or website])
- *Level 4*: high needs (ongoing/intensive real-time individual or group programming)
- *Level 5*: complex needs (specialist consultation and care, tertiary clinic)

Our original review protocol indicated that identified studies would be coded for quality as assessed

using AGREE II for guidelines^{47,48}; however, this was not done as no specific guidelines were identified and the AGREE II tool was not deemed appropriate. Team members used meta-ethnographic techniques to synthesize concepts, recommendations, and guidelines that commonly occurred across articles^{49,50}.

Phase 1 Results

1.1 Study Selection

Database searches identified 6334 records. Three additional articles known to the study authors published since the start of the COVID-19 pandemic were also included. After duplicates were removed, 4161 unique abstracts remained for review. Of these, 4101 were deemed not eligible. A total of 60 full texts were reviewed and 44 were excluded. Sixteen full texts met inclusion criteria. See [Figure 1](#) for the PRISMA review flowchart, including reasons for full-text exclusion.

1.2 Study Characteristics

Of the 16 articles meeting review inclusion criteria, 9 were scoping or systematic reviews/meta-analyses^{31,51–59}, 3 were commentaries/editorials/opinion articles^{25,60,61}, 2 were qualitative studies^{62,63}, and one was a non-systematic literature review⁶⁴. Articles addressed virtual care for a variety of chronic pain conditions of mixed etiology, including headaches, migraines, musculoskeletal pain, recurrent abdominal pain, chronic widespread pain/fibromyalgia, arthritis, post-concussion, sickle cell disease, and irritable bowel syndrome. Most articles addressed lower levels of the stepped care continuum. Types of virtual care discussed included apps, telephone support, virtual peer-to-peer, and web-based self-management with or without coach support.

1.3 Synthesis of Results

Meta-ethnography across the 16 articles identified four key themes, including opportunities to better leverage virtual care (theme 1), direct effective implementation of virtual care (theme 2), selection of virtual care platforms (theme 3), and gaps in need of further consideration when using virtual care (theme 4) to support youth with chronic pain and their families.

1.3.a Leveraging virtual care. Virtual care for youth with chronic pain and their families: is acceptable, reasonable, and effective; is underutilized (especially for real-time symptom assessment and psychological treatment); and increases access to care (particularly in rural or remote areas).

1.3.b Implementing virtual care. Virtual care for youth with chronic pain and their families: should be freely available across all technologies (telephone, apps, websites, videoconference); needs to include training, terms of use, and guidelines for health professionals, youth and families; must use secure infrastructure (encrypted, password protected, authorized access); should be developmentally appropriate; must meet ethical standards of care; and should be transparent in communication (therapist vs. computer-generated messaging).

1.3.c Best platforms for virtual care. Virtual care platforms for youth with chronic pain and their families: need to be user-friendly and acceptable to youth and families; must be backed by science; should involve youth, families, and health professionals in their development; should be individualized or customizable; must be comprehensive in terms of pain management (address pharmacological, psychological, and physical strategies); need to use multimedia content (videos, text, images); must meet accessibility standards; and should be able to integrate social and peer support.

1.3.d Identified gaps in virtual care. Virtual care for youth with chronic pain and their families: requires standardized practice guidelines for implementation and evaluation; must have evidence showing its effectiveness for all symptoms or concerns identified by youth and families; needs to include knowledge about its limitations and suitability for all aspects of care (such as physical exam); need to consider potential harms and impact on the therapeutic relationship; requires strategies to enhance

engagement; and needs integration into clinical care pathways, face-to-face care, and the electronic medical record.

A thorough list of research priorities for virtual care for individuals with chronic pain during the COVID-19 pandemic are additionally outlined in one of the included articles²⁵.

Phase 2 Methods and Results – currently underway

A scoping review^{40,41,45} is underway using three sources of information that will be synthesized in the evidence and gap map (EGM)^{35,36}.

2.1 Scoping Review

2.1.a Scientific and grey literature searches. The inclusion criteria from the Phase 1 scientific literature search will be used, but restrictions related to article type (inclusion criteria #5) will be removed to ensure primary studies evaluating virtual care interventions are also included (randomized controlled trials [RCTs], nonrandomized trials, observational studies, case reports, dissertations, and conference abstracts). The grey literature search will occur over 2-weeks and search websites of known groups producing work in this area (e.g. PainBC, app stores). Methods for screening and selecting articles from both searches is identical to that in Phase 1.

2.1.b Call for emerging innovations. The above searches may miss virtual care practices that have rapidly emerged in response to the COVID-19 pandemic and/or are currently under empirical study. We will conduct a call for emerging virtual care innovations that support mental health, substance use, and functioning in youth reporting pain using methodology from the Canadian Foundation for Health Improvement (CFHI). Respondents will complete a brief written description about the virtual care innovation, its application to date with youth reporting pain and their families, its focus on addressing mental health, substance use, and/or functioning, any completed or ongoing evaluation, involvement of youth/families in its development or design, and needed tools, personnel, technology, and estimated cost for implementation. The call will be distributed via email to pediatric chronic pain programs in North America, listservs (Society of Pediatric Psychology, Pediatric Pain, Pain in Child Health), patient organizations (PainBC), and partners (Solutions for Kids in Pain [SKIP], CFHI).

2.2 Data Collection and Quality ratings

Two team members will independently extract data, including: author; publication year; article type; type(s) of virtual care; cost/accessibility; resources needed; relevance to level(s) of stepped care (steps 1-5)³³; ability to address outcomes selected by Patient Partners and a Project Advisory Group of 3 youth and 3 parents with lived experience, and for pediatric chronic pain treatment studies⁶⁵: pain; mental health (anxiety, depression, trauma, sleep); substance use (opioids, alcohol, cannabis); functioning (school, peers, family). Articles will be independently assessed for quality using the Mixed Methods Appraisal Tool (MMAT-v2018) appropriate across study types^{66,67}. Emerging innovations with no evaluation will be given the lowest quality rating. Quality tools for systematic reviews (AMSTAR-2⁶⁸) or RCTs (Cochrane Risk of Bias⁶⁹) will be considered if sufficient articles exist ($n > 10$).

2.3 Evidence and Gap Map (EGM)

Data from the scoping review will be visually synthesized in an EGM using EPPI-Mapper⁷⁰ with accompanying narrative. Rows of the EGM will list levels of the stepped care model and columns will list outcomes. Each cell shows the number and quality of evidence for virtual care solutions on that combination of stepped care level and outcome. The EGM will identify areas with high quality evidence-based virtual care solutions (for immediate scale and spread) and areas where few or no solutions exist (for targeted virtual care development and research/policy prioritization)³⁵⁻³⁸.

Phase 2 Results

2.1 Scoping Review

2.1.a Scientific and grey literature searches. The scientific database searches identified 6305 records. After duplicates were removed, 4033 unique abstracts remained for review. Of these, 3715 were deemed not eligible. A total of 318 full texts are being reviewed for possible inclusion, after which data extraction will be conducted. The grey literature search is currently underway.

2.1.b Call for emerging innovations. The call for virtual care innovations was launched in partnership with SKIP and CFHI in early August 2020 and will remain open until September 30, 2020. More details are available here: <https://www.kidsinpain.ca/call-for-innovations>.

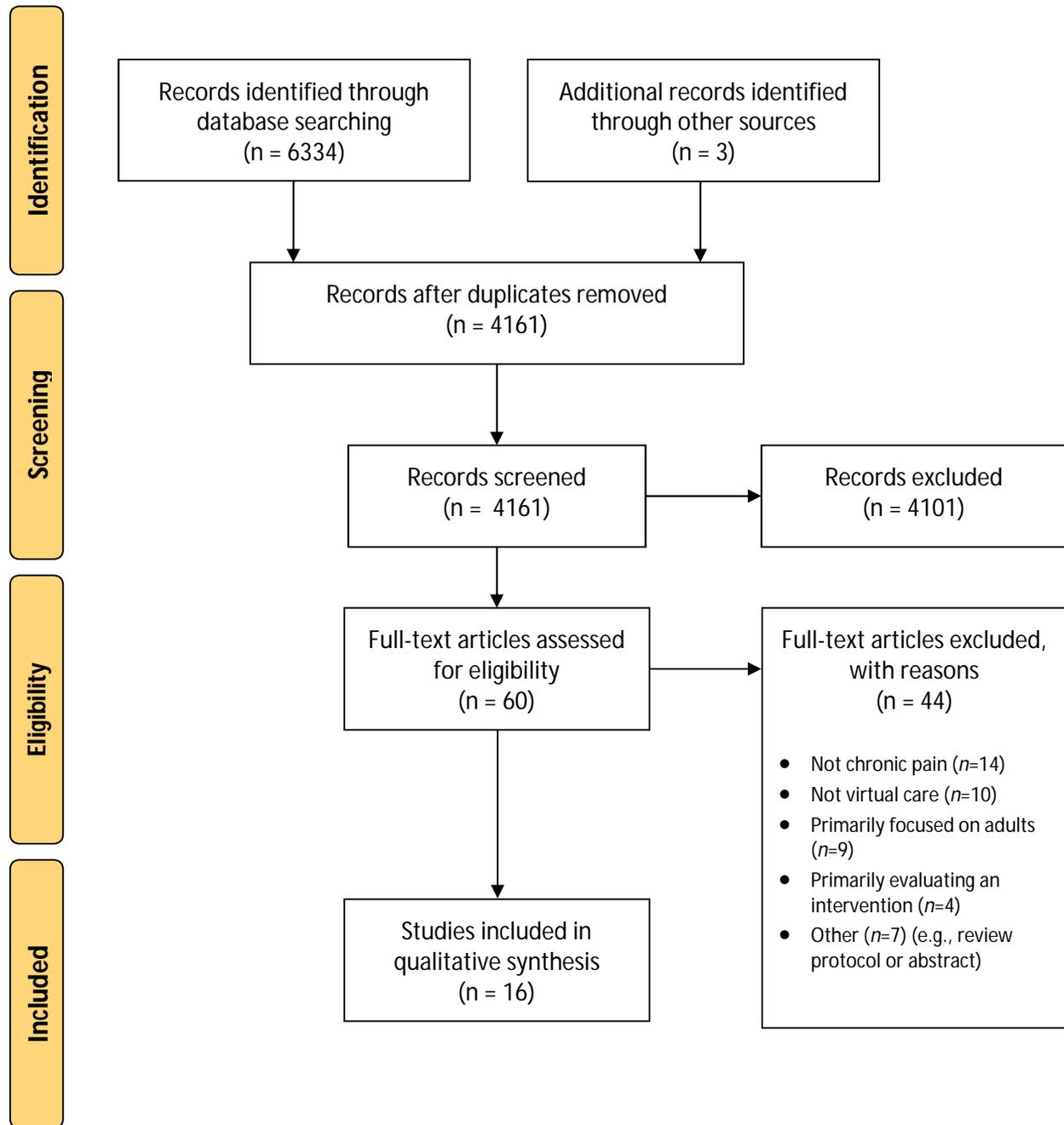
2.2 Data Collection and Quality ratings

The first meeting of the Project Advisory Group of youth and parents with lived experience was held on August 19, 2020. A second and final meeting is planned for August 25, 2020. Once full text review and the Project Advisory Group meetings are complete, data extraction and quality ratings will be undertaken.

2.3 Evidence and Gap Map (EGM)

To be completed once data extraction and quality ratings are completed.

Figure 1. Phase 1 – PRISMA Flow Diagram



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