



# BMJ Open Cannabis use among youth in Canada: a scoping review protocol

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## ABSTRACT

**Introduction** Canadian youth (aged 15–24) have the highest rates of cannabis use globally. There are increasing concerns about the adverse effects of cannabis use on youth physical and mental health. However, there are gaps in our understanding of risks and harms to youth. This scoping review will synthesise the literature related to youth cannabis use in Canada. We will examine the relationship between youth cannabis use and physical and mental health, and the relationship with use of other substances. We will also examine prevention strategies for youth cannabis use in Canada and how the literature addresses social determinants of health.

**Methods and analysis** Using a scoping review framework developed by Arksey and O'Malley, we will conduct our search in five academic databases: MEDLINE, Embase, APA PsycInfo, CINAHL and Web of Science's Core Collection. We will include articles published between 2000 and 2021, and articles meeting the inclusion criteria will be charted to extract relevant themes and analysed using a qualitative thematic analysis approach.

**Ethics and dissemination** This review will provide relevant information about youth cannabis use and generate recommendations and gaps in the literature. Updated research will inform policies, public education strategies and evidence-based programming. Results will be disseminated through an infographic, peer-reviewed publication and presentation at a mental health and addiction conference. Ethics approval is not required for this scoping review.

## INTRODUCTION

Canadian youth (aged 15–24) have one of the highest rates of cannabis use worldwide<sup>1 2</sup> with prevalence rates that are almost double that of adults. Recent data indicate that 44% of youth aged 16–19, and 51% of youth aged 20–24, report past year cannabis use versus 21% of adults over the age of 25.<sup>3</sup> Daily cannabis use is linked to more significant adverse effects<sup>4</sup> and is reported by 16% of youth aged 16–19 and 23% of those aged 20–24.<sup>3</sup> In Canada, recreational cannabis use was legalised in 2018 across the 10 provinces and 3 territories, and one of the key objectives of the Cannabis Act is to protect the health and safety of youth.<sup>5</sup> Despite this objective,

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This is the first comprehensive review examining youth cannabis use in Canada.
- ⇒ The search strategy has been developed by a research team with expertise in the methodology and subject area.
- ⇒ This scoping review will include all article types and methodologies.
- ⇒ Due to the nature of the scoping review framework, the studies included in the review will not be appraised for quality.

cannabis use among youth continues to be a public health concern linked with physical and mental health concerns including anxiety,<sup>6</sup> depression,<sup>7 8</sup> psychosis,<sup>9–11</sup> attention deficit hyperactivity disorder, respiratory problems and use of other illicit substances.<sup>12</sup> Youth with mental health concerns have higher rates of cannabis use,<sup>13</sup> and early initiation of cannabis use is linked with *increased* mental health concerns.<sup>12</sup> Earlier initiation and higher frequency of cannabis use are associated with more adverse effects<sup>14 15</sup> and a higher risk of dependence.<sup>16</sup>

Studies show that health knowledge and awareness of perceived risks influence the rates of cannabis consumption with higher rates when a substance is not perceived as harmful, which makes education and prevention a public health priority.<sup>15 17</sup> Canadian youth have a wide range of beliefs about recreational cannabis use, and many have misconceptions and lack information about the risks and harms associated with cannabis use.<sup>18 19</sup> Service providers also have gaps in knowledge about cannabis use in youth and need more education and training.<sup>20 21</sup> A recent survey conducted in the USA where 11 states have legalised recreational cannabis use found variation and gaps in service providers' knowledge and beliefs on cannabis. Many service providers described discomfort discussing cannabis use with clients.<sup>22</sup> Parents and caregivers also need more information

on the harms associated with cannabis use in youth, and studies have shown that parents have concerns about the adverse effects of cannabis use on mental health.<sup>23 24</sup> There is inadequate support for families and insufficient knowledge that is drawn from the lived experiences of diverse families.<sup>25</sup> Parents have been described as ‘invisible experts’ as they are often the core support for youth with substance use disorders, but their perspectives are often excluded from research, services, and policies.<sup>23 26</sup>

Despite widespread use and robust evidence of associations between cannabis use and adverse effects on youth,<sup>7 8 27</sup> there are several gaps in the current literature on youth cannabis use. These knowledge gaps are even wider with marginalised populations such as sexual and gender minority youth, immigrant and refugee youth, and Black, Indigenous and youth of colour.<sup>28–30</sup> There is some research showing gender differences in cannabis use,<sup>31</sup> as well as ethnoracial and immigrant group differences,<sup>32</sup> but more research is needed to increase our understanding of factors that may be contributing to these differences.

Given the gaps in our understanding of risks and harms to youth, updated research can inform policies, public education strategies and evidence-based programming.<sup>28 33</sup> Hawke and colleagues<sup>27</sup> state that there is a need for research that is youth-specific and cannabis-specific with a focus on concurrent disorders. Others argue that research and educational interventions do not consider contextual and cultural factors<sup>34</sup> and have not engaged youth and parents adequately.<sup>25 35</sup> Few studies have examined parents’ perspectives on addressing cannabis use, resulting in substance use programmes that are not evidence-based and developed without the lived experiences and expertise of parents and youth.<sup>25</sup> Furthermore, this underlines the importance of research that focuses on diversity within the Canadian youth population and the influence of social determinants of health.<sup>5 28 36</sup>

Early intervention is essential to mitigate the adverse effects of cannabis use on youth. However, the lack of service continuity contributes to 52% of youth dropping out of treatment, resulting in untreated mental health and substance use concerns, poorer long-term mental health outcomes and increased risk of severe mental illness, homelessness, high school dropout and unemployment.<sup>13</sup> In Canada, several factors contribute to high rates of untreated mental health and substance use concerns,<sup>37</sup> including a lack of a national strategy and pan-Canadian policy, unresponsive and fragmented services that do not meet the needs of youth with concurrent disorders,<sup>38</sup> and inadequate engagement of youth and families in service development and delivery.<sup>39 40</sup> Moreover, LGBTQ youth,<sup>41</sup> immigrant and refugee youth, as well as Black, Indigenous, youth of colour<sup>28</sup> have additional barriers to accessing mental health and addiction services related to inequities, discrimination and systemic racism.<sup>42–44</sup>

The objectives of this protocol are to (1) scope the literature on cannabis use among youth under 25 in Canada; (2) examine the relationship between cannabis use

and physical and mental health in Canadian youth; (3) examine the relationship of cannabis use and co-occurring use of other substances in Canadian youth; (4) identify prevention strategies, interventions and programmes to address cannabis use in Canada; (5) explore how the Canadian literature considers the influence of social determinants of health on youth cannabis use; and (6) identify gaps and recommendations in the literature.

## METHODS AND ANALYSIS

Scoping reviews are widely used approaches for mapping the literature on topics that have insufficient evidence, and they provide greater breadth and depth than other reviews.<sup>45</sup> Due to the limited research on cannabis use among Canadian youth, this form of knowledge synthesis will be valuable in providing an overview of existing literature, and it will identify knowledge gaps and generate recommendations to inform policies and services.<sup>46 47</sup> This scoping review will follow the methodological framework introduced by Arksey and O’Malley,<sup>48</sup> which includes the following five phases: (1) identification of the research question, (2) identification of relevant studies, (3) selection of relevant articles, (4) charting of the data, and (5) identification, synthesis and reporting on study findings.<sup>48</sup> This scoping review is also following guidelines described in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR).<sup>49</sup> See online supplemental appendix A for the PRISMA-ScR checklist.

### Stage 1: identifying the research question

As highlighted in our preliminary review of the literature, there are significant gaps in the literature on youth cannabis use in Canada. Using a population, concept and context framework, the research team consisting of four social work faculty members (TK, EL, SLC and CCW), one research coordinator who is a doctoral candidate (TE), one social sciences librarian (JL) and two graduate-level research assistants (RV and MS-T) developed these research questions: (1) what type of literature is available describing youth cannabis use in Canada? (2) how does the literature describe the relationship between cannabis use and physical and mental health? (3) how does the literature describe the relationship between Canadian youth cannabis use and use of other substances? (4) what are the programmes and prevention/intervention strategies used to address youth cannabis use in the Canadian literature? (5) how does the literature consider the influence of the social determinants of health on cannabis use in Canadian youth? (6) what are the gaps and recommendations identified in the literature on cannabis use in Canadian youth?

### Step 2: identifying relevant studies

A social sciences librarian (JL) will design a comprehensive search of the published literature. Text words and controlled vocabulary relating to youth, Canada

**Table 1** Search strategy for MEDLINE (Ovid)

Number	Searches
1.	(canad* or "british columbia*" or "Colombie britannique" or alberta* or saskatchewan* or manitoba* or ontari* or quebec* or "nouveau brunswick" or "nova scotia*" or "nouvelle ecosse" or "prince edward island*" or newfoundland* or labrador* or nunavu* or nwt or "northwest territori*" or yukon* or nunavik or inuvialuit).tw,kf,jw,nw.
2.	exp Canada/
3.	1 or 2 [Canada]
4.	"delta(9)-tetrahydrocannabinolic acid".nm. or (cannabi* or dronabinol or ha?chi?ch\$1 or hashis?h\$1 or hash or mari#uana* or tetrahydrocannabi* or tetra hydro cannabi* or THC or bhong or bhongs or cesamet or dexanabinol or dronabinol or ganja or ganjas or hemp or marinol or nabilone or nabiximol* or sativex or indica or sativa or CBD).tw,kf. or (tetrahydro adj cannabi*).tw,kf. or ((blunt or blunts or pot) adj2 smok*).tw,kf.
5.	exp cannabinoids/ or cannabis/ or "marijuana abuse"/ or exp "marijuana use"/ or "medical marijuana"/ or "cannabinoid receptor agonists"/ or "marijuana abuse"/
6.	4 or 5 [Cannabis]
7.	(teen* or youth* or adolescen* or child* or puberty or pubescen* or juvenile* or (young adj2 (adult* or person* or individual* or people* or population* or man or men or wom#n)) or youngster* or highschool* or college* or universit* or ((secondary or high*) adj2 (school* or education)) or "emerging adult*").tw,kf.
8.	adolescent/ or young adult/ or child/ or Adolescent Health Services/
9.	7 or 8 [Youth]
10.	3 and 6 and 9
11.	limit 10 to yr="2000 -Current"

and cannabis will be adapted from reputable published search terms.<sup>50–53</sup> **Table 1** presents a draft search strategy developed for MEDLINE (Ovid). The search strategy will be peer-reviewed by an independent librarian and translated into Embase (Ovid), APA PsycInfo (Ovid), CINAHL (EBSCO) and Web of Science Core Collection, which includes Science Citation Index Expanded, Social Sciences Citation Index, Arts & Humanities Citation Index, Emerging Sources Citation Index, Conference Proceedings Citation Index and Book Citation Index. A date limit of 2000+ will be applied. Search results will be downloaded on a single day and then uploaded to Covidence for deduplication and screening.

### Step 3: study selection

We will include articles meeting the following inclusion criteria: (1) written in English or French; (2) published on or after 2000; (3) focus on Canada and/or any of its provinces, territories or other jurisdictions; (4) focus on youth aged 24 and younger; (5) focus on cannabis and/or cannabis use; and (6) empirical studies using any type of method (ie, quantitative, qualitative and mixed). Papers that examine substance use are eligible if cannabis is specifically identified. Likewise, papers that focus on adult populations and include young adults aged 18–24 are also eligible if the young adult age group is distinguished. We will also include papers that compare findings related to cannabis use and youth across countries, provided Canada is included as one of the countries of comparison. We will exclude reviews, theoretical or conceptual papers, books, book chapters, book reviews, dissertations, commentaries and editorials.

After selecting a list of articles from our search strategy, we will use an iterative two-stage peer review screening

process and include two independent screeners at each stage. In the first stage, two independent reviewers (TE, RV and/or MS-T) will screen articles for suitability based on title, abstract and keywords. In the second stage, the reviewers will conduct an independent full-text review of articles selected in phase I. The first author (TK) will resolve discrepant findings between the first and second reviewers and hold debriefing meetings to clarify questions around eligibility. To support the process, we will use Covidence, a web-based software for systematic and scoping reviews that facilitates screening, study selection and data extraction.<sup>54</sup>

### Step 4: charting the data

Based on the objectives and research questions, the research team has developed charting categories, and these will be used to extract relevant information from the selected papers. A data charting form will be prepared that includes the following charting categories: (1) authors; (2) year of publication; (3) name of journal; (4) type of paper (eg, empirical, review and conceptual); (5) method (eg, qualitative, quantitative and mixed methods); (6) sample size and characteristics; (7) physical and mental health outcomes; (8) use of other substances; (9) programmes, prevention and intervention strategies; (10) influence of social determinants (eg, poverty, housing, access to healthcare, racism and discrimination); (11) youth and/or family engagement in research; and (12) gaps and recommendations for policy, practice, education and research. To enhance reliability, two reviewers (TE, RV, and/or MS-T) will independently chart the first five articles meeting the inclusion criteria, and the lead author (TK) will review charting completed by the reviewers and resolve conflicts. Any discrepancies



will be discussed in a debriefing meeting and charting categories will be refined if necessary. Full data abstraction will only begin after sufficient agreement has been achieved on charting (>90%). Findings will be organised and presented on a data extraction spreadsheet.

### Step 5: identification, synthesis and report of study findings

Findings on the data extraction form will be synthesised and analysed using descriptive numerical summaries and thematic analysis.<sup>55</sup> There will be multiple forms of knowledge translation used to report study findings, including an open-access publication in a peer-reviewed journal, presentation at a relevant addiction and/or mental health conference, and an infographic that presents the findings in a more engaging manner.

### Patient and public involvement

While we will not involve patients or members of the public in this review, we will disseminate the results of this scoping review to mental health and substance use community organisations serving youth and families.

### ETHICS AND DISSEMINATION

The scoping review protocol outlined in this paper will advance knowledge of cannabis use in Canadian youth. The information gathered for this paper and the outlined scoping review were retrieved from publicly available sources; therefore, ethics approval is not required for this project. The results will be disseminated through a peer-reviewed journal and reported at national and international conferences on mental health and addictions.

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**Contributors** All authors made substantive intellectual contributions to the development of this protocol. TK, EL, SLC, and CCW contributed to the conceptualisation of the protocol. TK developed, wrote, and edited the initial protocol. TE, RV and MS-T contributed to editing and writing parts of the protocol. JL developed the search strategy and contributed to the writing of the protocol. All authors critically reviewed and revised the final version prior to submission.

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**Competing interests** None declared.

**Patient and public involvement** Patients and/or the public were not involved in the design, conduct, reporting or dissemination plans of this research.

**Patient consent for publication** Not applicable.

**Ethics approval** Not applicable.

**Provenance and peer review** Not commissioned; externally peer reviewed.

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## Appendix A - Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist<sup>1</sup>

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
<b>TITLE</b>			
Title	1	Identify the report as a scoping review.	1
<b>ABSTRACT</b>			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	2
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	4-6
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	6
<b>METHODS</b>			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	Protocol in BMJ Open
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	9-10
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	8 for sources (date N/A for protocol)
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	8-9
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	9-10
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	10-11
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	10-11
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe	N/A



SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
		the methods used and how this information was used in any data synthesis (if appropriate).	
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	11
<b>RESULTS</b>			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	N/A
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	N/A
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	N/A
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	N/A
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	N/A
<b>DISCUSSION</b>			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	N/A
Limitations	20	Discuss the limitations of the scoping review process.	3 for protocol
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	N/A
<b>FUNDING</b>			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	12

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

\* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

<sup>i</sup> Some of the items are not applicable (N/A) due to the fact this manuscript is a scoping review protocol.

