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The Use of Equity-Informed Social Media Risk Communication Tools. A Scoping Review Protocol

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ABSTRACT

Introduction: Health agencies and community organizations play a crucial role in disseminating information to the public about COVID-19 risks and events, instructions on how to change behavior to mitigate those risks, motivating compliance with health directives and addressing false information. Social media platforms are a critical tool in risk communication, providing a medium for rapid transmission of messages as well as providing the opportunity for engagement and immediate feedback. Access to health information, services and support are especially important for marginalized and underserved ("equity-deserving") populations who are disproportionately affected by COVID-19. This scoping review aims to review the breadth and depth of the academic and grey literature on equity informed social media risk communication tools to provide guidance on promising practices and principles for reaching marginalized populations directly or through community agencies.

Methods and analysis: Arksey and O'Malley's (2005) framework guided the identification of the research question; identification and selection of relevant studies from electronic databases and hand-searches of discipline-specific journals; extraction and charting of the data; and collating and reporting of findings. The results of the screening process will be reported using the PR-ISMA-ScR guidelines.

Findings: We will identify reported facilitators and barriers to the uptake of risk communications. We will also identify recommendations for equity informed risk communication.

Ethics and Dissemination: This study does not require ethics approval. We intend to disseminate the results through publication in an open-access peer-reviewed journal, conference presentations, lay summaries (e.g., checklists) for health organizations and messages to be shared through social media.

ARTICLE SUMMARY

Strengths and limitations of this study

- This review will inform the development of effective social media risk communications for COVID-19 and future pandemics which consider the unique impact on equity-deserving populations.
- We intend that the results of the review will inform recommendations for standards in risk communications for equity-deserving populations.
- An anticipated challenge is the likely small number of studies that will explicitly focus on equity, despite discussions that are consistent with equity concerns.
- The inclusion of forward citation searching, and grey literature searching should help to mitigate concerns regarding lack of specificity with equity informed COVID-19 risk communications.

INTRODUCTION

Inequalities in access to the highest standard of physical and mental health between specific population groups have been well-documented.[1] Evidence shows that social factors such as education, employment status, income level, gender, race, and ethnicity influence how healthy a person is.[2, 3] Long-standing structural factors also have an effect as health disparities due to differences in living conditions, education, health literacy, neighbourhood and build environment, socioeconomic status, discrimination, immigration status, cultural barriers, economic challenges, risk perceptions, among other factors. [3] A current concern is the effect of the COVID-19 pandemic, which has caused millions of worldwide deaths and lasting health problems in some, on marginalized and underserved populations.

In this paper we make the intentional choice to refer to communities who are experiencing marginalisation, stigma, discrimination, inequality, inequity, and other barriers to participating in society due to their race, ethnicity, ability, gender or sexuality, economic status migration status, as “equity-deserving”. Due to long standing inequalities and unique barriers experienced by equity-deserving populations, there is evidence to suggest that certain groups are more impacted by the COVID-19 pandemic than other populations due to their occupational, social, economic, and other health and life circumstances.[4]

Some groups disproportionately affected by COVID-19 include, but are not exclusive to, women,[5] Indigenous populations,[6] racial and ethnic minorities,[7] sexual and gender minorities,[8] people experiencing poverty and people experiencing homelessness.[5] These equity-deserving groups are at risk in a variety of ways. For women experiencing homelessness, lockdowns and closure of services have increased their risk of experiencing intimate partner

violence and inability to turn to supports.[5] Women engaging in sex work are at higher risk due to the physical proximity required for their occupation.[4] Indigenous populations lack of access to running water at reserves and housing instability makes it difficult for community members to socially isolate, wash their hands, and practice other COVID-19 preventative measures.[6] In 2020, The Innovative Research Group (INNOVATIVE) found that over half of households (53%) identifying as LGBTQI2S were impacted by reduced employment hours or layoffs due to the pandemic compared to 39% of non-LGBTQI2S households.[8] Racialized persons are also more likely to live in multi-generational and crowded households, which makes it difficult to practice social distancing and isolate from family members who are elderly or who may have underlying co-morbidities.[7] They are also at higher risk for being evicted and becoming homeless.[7] (People experiencing homelessness are at increased risk of infection with COVID19 due to their lack of safe housing and difficult to adhere to public health directives such as physical distancing, isolation, and quarantine.[5]

Risk communications and social media

Health agencies and organizations play a crucial role in the disseminating information to the public about COVID-19 risks and events, providing instructions on how to change behavior to mitigate those risk, motivating compliance with health directives and addressing false information. Risk communication is a critical tool in response to different pandemic consequences, as it aims to establish public and professional awareness and confidence.[9,10] Risk communication entails the systematic dissemination of information to diverse audiences (e.g., individuals, communities, and institutions) facilitating their informed, independent decision making about the existence, nature, and/or severity of risks and hazards affecting health, safety,

and the environment.[11] Risk communication also involves the two-way exchange of information between interested parties to make decisions about how to best manage risks.[10]

Social media platforms are a critical tool in risk communication, providing an online medium for rapid transmissions of messages as well as providing the opportunity for engagement and immediate feedback.[12] Social media sites come in a variety of forms which provide different features for users, such as social networking, professional networking, media sharing, content production and knowledge/information aggregation (see Table 1). Social media is increasingly used for public health and health promotion due to its potential to engage with audiences for enhanced and quick communication and improved capacity to promote programs, products, and services.[13,14] Social media may also be used by health organisations to market insights, establish a brand and create brand awareness, disseminate critical information, expand reach to more diverse audiences, and foster public engagement and partnerships.[14]

Table 1: Social Media Sites Used by Healthcare Organisations

Function	Description	Examples
Social network	'Web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site.'' [15].	Facebook, Myspace, Google Plus, Twitter, Snapchat
Professional network	Sites which provide the opportunity for professionals to participate in online communities, listen to experts, and network and communicate with colleagues	LinkedIn
Media Sharing	Media-sharing sites offer a large selection of social media tools that are optimized for viewing, sharing, and embedding digital media content on the Web. They also include features such as profiles, connections, comments, and private messaging [16].	YouTube, TicTok
Knowledge/information aggregation	A collaborative website that can be directly edited by anyone with access to the site [16].	Wikipedia
Content Production-Blogs and Microblogs	Blogs are an open forum which provide the opportunity to publish large amounts of long-form information and the publication of video and audio material. Includes a comment function allowing for ongoing dialogue between the blogger and his or her audience [17]. Microblogs are web services that allows subscribers to send short messages to other subscribers [16].	Tumblr, Blogger, Twitter

Chesser et al. demonstrate the importance of increased public health information through trusted information channels and sources and suggest that public health experts versus the "government" are more trusted to develop solutions to the COVID-19 pandemic.[18] They further suggest that additional content about signs, symptoms and prevention strategies for COVID-19 should consistently be shared through community social media accounts.[18] However, social media also has the potential to increase health inequities as differences in access to technology, culture and preferences might affect the uptake of risk communications.[13]

As the impact of COVID-19 amplifies existing health inequalities, the importance of equity-informed social media responses to the COVID-19 pandemic is clear. The effectiveness of social media risk communication depends partly on meeting the specific communication needs of all populations-especially those most vulnerable to the risks and most likely to experience communication gaps. A previously conducted national survey from the Harvard School of Public Health and the CDC about beliefs about public health interventions for a hypothetical pandemic influenza revealed that beliefs about pandemics varied by socioeconomic circumstances, cultural background, and health status.[19] Employment security also impacts the level of adherence to risk reduction guidelines. For example, low-income, African American, and Hispanic individuals were more likely to believe that salary or job loss would result if they or a family member adhered to public health recommendations to stay at home during influenza pandemic.[20] The additional health risks faced by equity-deserving populations demand effective risk communications to help equity-deserving populations recognize and minimize risks and more effectively prevent and respond to COVID-19 infection and spread. Risk values, and perspectives on risk influence how individuals interpret health risk communications and how they behave in response,[13] not to mention circumstances and opportunities to enact public health measures in one's environment.

This scoping review aims to review the breadth and depth of the academic and grey literature on equity informed social media risk communication tools to provide guidance on promising practices and principles for reaching equity-deserving populations directly or through community organizations. The objectives of this scoping review are as follows:

- To review the breadth and depth of the academic and grey literature on equity informed social media risk communication tools.
- To explore how evidence-based recommendations have been tailored through social media to marginalized populations
- To identify gaps in the literature.

METHODS AND ANALYSIS

This scoping review follows the methodological framework described by Arksey and O'Malley which comprises five stages: (1) identifying the research question, (2) identifying relevant studies, (3) study selection, (4) charting the data, (5) collating, summarizing, and reporting the results.[21]

Stage 1: Identifying the research question

The scoping review is guided by the following research question:

1) How did health agencies and community organizations produce social media risk communications and strategies regarding covid-19 to equity-deserving populations?
2) What are effective practices and principles for providing equity-informed social media risk communications?

Stage 2: Identifying relevant literature

We had ongoing consultations with a scoping review specialist librarian, who assisted in developing the search strategy including the key words and identifying relevant databases. A keyword search will be conducted using the following terms:

TITLE-ABS-KEY ("infectious disease*" OR COVID* OR pandemic* OR corona* OR "SARS*" OR "severe acute respiratory syndrome") AND TITLE-ABS-KEY ("social media" OR "Web 2.0"

OR "social networking" OR twitter OR Instagram OR TikTok OR Facebook OR Reddit OR YouTube OR Snapchat OR LinkedIn OR Pinterest OR WhatsApp OR "social networking site*" or "online social network*" or "virtual world*" or "online communit*" or "online forum*") AND TITLE-ABS-KEY (equit* OR marginali* OR ((vulnerable OR underresourced OR "under resourced" OR underserved OR "underserved" OR "high risk") W/3 (individual* OR person* OR people OR population* OR group*)) OR BIPOC OR racis* OR indigenous OR Black OR minorit* OR ethnic* OR divers* OR inclusion* OR Accesibil* OR "disabled person*" OR "sexual and gender minorities" OR "health care disparities") AND TITLE-ABS-KEY (campaign OR "risk communication*" OR engagement OR outreach OR advocacy OR prevention OR engagement OR education OR "health promotion" OR awareness OR marketing)'. These key words will be used to select MESH terms in the relevant databases:

- CINAHL Complete
- MEDLINE (OVID)
- Business Source Complete
- EMBASE database **OVID**
- Scopus
- PubMed's curated COVID-19 literature hub: Lit Covid
- PsycINFO **OVID**

Grey literature from health organizations with relevance to the focus of our research (e.g., risk communications, equity) will be included. A list of relevant grey literature sources has been informed by a rapid review focusing on risk communication.[22] These websites include:

- World Health Organization's Global literature on coronavirus disease
- NCCDH Equity-informed Responses to COVID-19 (key term search)
- Public Health + (hand search)
- COVID-19 Living Overview of the Evidence (L·OVE) (key word search)

- NCCEH Environmental Health Resources for the COVID-19 Pandemic (key term search)
- NCCHPP Public Health Ethics and COVID-19 (key term search)
- NCCID Disease Debrief (key term search)
- NCCIH Updates on COVID-19 (key term search)

The search terms used to search the academic literature will also be used to identify relevant documents from these national organizational websites and national evidence hubs. Links to potentially relevant publications will be extracted for further screening by two researchers.

Stage 3: Literature selection

Inclusion criteria: We will conduct a broad search of the literature. We will include articles that meet all the inclusion criteria.

Table 2: Inclusion and Exclusion Criteria

	Inclusion Criteria	Exclusion Criteria
Population	Equity-deserving populations (marginalized populations, vulnerable populations, minorities, at-risk populations, communities experiencing stigma, discrimination, inequality, inequity,)	General population
Concept	Risk communication through social media (e.g., communication about COVID-19 risks and events, instructions on how to change behaviour to mitigate risks, motivating compliance and addressing false information)	General media such as news
Context	COVID-19	Other infectious diseases such as HIV and Ebola
Time	After 2019	Before 2019

Exclusion criteria: In addition to excluding publications that do not meet the above inclusion criteria, we will exclude any articles that focus solely on risk communication without consideration of equity. We will also exclude articles that do not discuss social media within the

context of a public health response to COVID-19. Due to resources limitations, we will only be including articles written in English.

All references will be exported to reference manager software, COVIDENCE, to organize citations and remove duplicates. Title and abstract review will be conducted by two researchers. The full text of the selected article will be further screened against the inclusion criteria by two researchers. After a pilot screening process, any discrepancies will be discussed among the researchers until consensus is reached. Where necessary, discrepancies will be resolved through consultation with a third reviewer. The results of the screening process will be reported using the PRISMA-ScR guidelines.[23]

Stage 4: Charting the data

A data charting table will be used to extract data systematically from the included articles. This data extraction table was developed in accordance with the objectives of our scoping review, as well as discussions among members of our research team to ensure that we identify all relevant information. The data extracted from all included documents will include the following: (1) title (2) author(s), (3) year of publication, (4) type of document, (5) countries or regions studied, (6) aim or study purpose, (7) methodology, (8) type(s) of social media discussed, (9) target population (10) key findings (process, principles, practices) (11) frameworks discussed (12) recommendations (13) limitations of study. Two researchers will complete the data extraction and a third researcher will review the ongoing data extraction to determine if adjustments need to be made. The data extraction table will be changed and adapted during the process of gathering information from the included articles if necessary, and all modifications made will be explained fully in the final review.

Stage 5: Collating, summarising, and reporting of results

Results from this scoping review will be presented as a descriptive summary of the results from all included papers. We will also conduct a thematic analysis and will inductively organize the data into descriptive themes. This thematic analysis will be presented as recommendations for equity informed risk communication through social media.

Stage 6: Consultation

This review is part of a project titled Depending on the Third Sector for Effective and Just Pandemic Prevention Communication to Vulnerable Populations. Results will be discussed with representatives from health agencies and community organizations with a mandate to service equity-deserving individuals and families.

Patient and public involvement

Patients and Public were not involved in the design and conduct of this study. Health agencies and community organisations will be involved by informing plans for dissemination of the study results to equity deserving communities as part of the consultation phase of this scoping review.

ETHICS AND DISSEMINATION

As the scoping review methodology consists of reviewing and collecting data from publicly available materials, this study does not require ethics approval.

We intend to disseminate the results through publication in an open-access peer-reviewed journal, conference presentations, lay summaries for health organizations and messages to be shared through social media. We will publish the results of this review in a public health or health

services research journal to maximize knowledge translation to social scientists and health services researchers pursuing research on health equity.

DISCUSSION

This scoping review will map the breadth and depth of the academic and grey literature on equity informed social media risk communication tools, practices, and principles to provide guidance on promising practices for social media covid risk communications to mitigate risk behaviors in equity-deserving populations during a pandemic. We anticipate that this scoping review will also aid organisations in determining how to tailor risk communications to target populations during non-emergency times. Failure to communicate risks and risk mitigating interventions/behaviours might perpetuate existing inequities experienced by some populations.

ACKNOWLEDGEMENTS

We thank the scoping review specialist librarian at Western University who assisted in developing the search strategy and identifying relevant databases.

DATA MANAGEMENT AND OVERSIGHT

Two members of the research team will complete the literature search and screen them for inclusion criteria. A third researcher will review this screening process. All researchers will extract and analyze the data.

DATA STORAGE AND SECURITY

The database for the scoping review can be accessed by contacting the corresponding author.

AUTHOR STATEMENT

LC and AK contributed to the conceptualization of this study and acquiring funding. NP led the development of the study design and search strategy. LC and AK contributed to the design of the study and revising drafts for interdisciplinary intellectual content.

FUNDING

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CONFLICTS OF INTERESTS

None declared.

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Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
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.	2-3
INTRODUCTION			
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.	4-7
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.	8
METHODS			
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.	n/a
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.	10-11
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.	9-10
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	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.	9-12
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.	11
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	8
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.	12
RESULTS			
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
DISCUSSION			
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.	n/a
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
FUNDING			
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.	18

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).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.

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ABSTRACT

Introduction: Health agencies and community organizations play a crucial role in disseminating information to the public about COVID-19 risks and events, instructions on how to change behavior to mitigate those risks, motivating compliance with health directives and addressing false information. Social media platforms are a critical tool in risk communication, providing a medium for rapid transmission of messages as well as providing the opportunity for engagement and immediate feedback. Access to health information, services and support are especially important for marginalized and underserved ("equity-deserving") populations who are disproportionately affected by COVID-19. This scoping review aims to review the breadth and depth of the academic and grey literature on equity-informed social media risk communication tools to provide guidance on promising practices and principles for reaching equity-deserving populations through social media.

Methods and analysis: Arksey and O'Malley's (2005) framework guided the identification of the research question; identification and selection of relevant studies from electronic databases and hand-searches of discipline-specific journals; extraction and charting of the data; and collating and reporting of findings. The results of the screening process will be reported using the PR-ISMA-ScR guidelines.

Findings: We will identify reported facilitators and barriers to the development of risk communications that target equity-deserving communities. We will also identify recommendations for equity-informed risk communication for COVID-19.

Ethics and Dissemination: This study does not require ethics approval. We intend to disseminate the results through publication in an open-access peer-reviewed journal, conference presentations, lay summaries (e.g., checklists) for health organizations and messages to be shared through social media.

ARTICLE SUMMARY

Strengths and limitations of this study

- The proposed scoping review addresses the need for a comprehensive review of social media risk communication tools directed to equity-deserving populations who are disproportionately affected by COVID-19.
- A comprehensive search strategy has been developed in consultation with a librarian to maximize heterogeneity of results, including forward and reverse citations and a grey literature search.
- This scoping review will include a consultation phase with stakeholders from community organizations who work with equity deserving communities.
- This review will be limited to 2019 and beyond to capture specific references to COVID-19.

INTRODUCTION

Inequalities in access to the highest standard of physical and mental health between specific population groups have been well-documented.[1] Evidence shows that social factors such as education, employment status, income level, gender, race, and ethnicity influence how healthy a person is.[2, 3] Long-standing structural factors also have an effect on health disparities among some population groups due to differences in living conditions, education, health literacy, neighbourhood and build environment, socioeconomic status, discrimination, immigration status, cultural barriers, economic challenges, risk perceptions.[3]

In this paper we make the intentional choice to refer to communities who are experiencing marginalisation, stigma, discrimination, inequality, inequity, and other barriers to participating in society due to their race, ethnicity, ability, gender, sexuality, economic status and/or migration status, as “equity-deserving”. Due to long-standing inequalities and unique barriers experienced by equity-deserving populations, there is evidence to suggest that certain groups are more impacted by the COVID-19 pandemic than other populations due to their occupational, social, economic, and other health and life circumstances.[4] A current concern is the mortality and morbidity effects of the COVID-19 pandemic on marginalized and underserved populations.[4]

Some groups disproportionately affected by COVID-19 include, but are not exclusive to, women,[5] Indigenous populations,[6] racial and ethnic minorities,[7] sexual and gender minorities,[8] people experiencing poverty and people experiencing homelessness.[5] These equity-deserving groups are at risk in a variety of ways. For women experiencing homelessness, lockdowns and closure of services have increased their risk of experiencing intimate partner

violence and inability to turn to supports.[5] Women engaging in sex work are at higher risk due to the physical proximity required for their occupation.[4] Indigenous populations lack of access to running water at reserves and housing instability makes it difficult for community members to socially isolate, wash their hands, and practice other COVID-19 preventative measures.[6] In 2020, The Innovative Research Group (INNOVATIVE) found that over half of households (53%) identifying as LGBTQI2S were impacted by reduced employment hours or layoffs due to the pandemic compared to 39% of non-LGBTQI2S households.[8] Racialized persons are also more likely to live in multi-generational and crowded households, which makes it difficult to practice social distancing and isolate from family members who are elderly or who may have underlying co-morbidities.[7] They are also at higher risk for being evicted and becoming homeless.[7] People experiencing homelessness are at increased risk of infection with COVID-19 due to their lack of safe housing and difficult to adhere to public health directives such as physical distancing, isolation, and quarantine.[5] In addition equity-deserving populations can be more vulnerable in pandemic or emergency situation due to factors such as their lack of access to effective surveillance and early-warning systems, and health services.[9]

Risk communications and social media

Health agencies and organizations play a crucial role in the disseminating information to the public about COVID-19 risks and events, providing instructions on how to change behavior to mitigate those risks, motivating compliance with health directives and addressing false information. Risk communication is a critical tool in response to different pandemic consequences, as it aims to establish public and professional awareness and confidence.[10,11] Risk communication entails the systematic dissemination of information to diverse audiences

(e.g., individuals, communities, and institutions) facilitating their informed, independent decision making about the existence, nature, and/or severity of risks and hazards affecting health, safety, and the environment.[12] Risk communication also involves the two-way exchange of information between interested parties to make decisions about how to best manage risks.[11]

Social media platforms are a critical tool in risk communication, providing an online medium for rapid transmissions of messages as well as providing the opportunity for engagement and immediate feedback.[13] Social media sites come in a variety of forms which provide different features for users, such as social networking, professional networking, media sharing, content production and knowledge/information aggregation (see Table 1). Social media is increasingly used for public health and health promotion due to its potential to engage with audiences for enhanced and quick communication and improved capacity to promote programs, products, and services.[14,15] Social media may also be used by health organisations to market insights, establish a brand and create brand awareness, disseminate critical information, expand reach to more diverse audiences, and foster public engagement and partnerships.[15] Twitter is seen as especially popular in the context of public health crises due to its ability to promote rapid dissemination and results in the spread of user generated content.[16]

Table 1: Social Media Sites Used by Healthcare Organisations

Function	**Description**	**Examples**
Social network	'Web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site.'' [17]	Facebook, Myspace, Google Plus, Twitter, Snapchat
Professional network	Sites which provide the opportunity for professionals to participate in online communities, listen to experts, and network and communicate with colleagues.	LinkedIn
Media Sharing /Social Network	Media-sharing sites offer a large selection of social media tools that are optimized for viewing, sharing, and embedding digital media content	YouTube, TicTok

	on the Web. They also include features such as profiles, connections, comments, and private messaging.[18]	
Knowledge/information aggregation	A collaborative website that can be directly edited by anyone with access to the site.[18]	Wikipedia
Content Production-Blogs and Microblogs	Blogs are an open forum which provide the opportunity to publish large amounts of long-form information and the publication of video and audio material. Includes a comment function allowing for ongoing dialogue between the blogger and his or her audience.[19] Microblogs are web services that allows subscribers to send short messages to other subscribers.[18].	Tumblr, Blogger, Twitter

During the H1N1 pandemic of 2009 social media was shown to facilitate the monitoring and surveillance of disease levels and public concern.[20] Social media was also a key tool for risk communication during the Ebola outbreak, although researchers found a lack of understanding in the use of social media research in routine health communication practice of public health agencies.[21] In the context of COVID-19 it is clear that social media continues to play an important role. For example, Resendes examined public health risk communication via social media by provincial and local health authorities in Ontario during the COVID-19 pandemic.[22] They noted that this group of Ontarian governmental bodies focused on offering information and resources to the public, while providing updates about the spread of COVID-19 in the community but not on the impact of COVID-19 on vulnerable populations or on providing clarity on misinformation.[22] Anecdotally, Chesser et al. demonstrate the importance of increased public health information through trusted information channels and sources and suggest that public health experts versus the "government" are more trusted to develop solutions to the COVID-19 pandemic.[23] They further suggest that additional content about signs, symptoms and prevention strategies for COVID-19 should consistently be shared through community social media accounts.[23]

However, social media also has the potential to increase health inequities as differences in access to technology, culture and preferences might affect the uptake of risk

communications.[14] Furthermore, the influence of social media and other digital platforms on the unfolding of the COVID-19 pandemic has demonstrated how the spread of misinformation is proving to be as much a threat to global public health as the virus itself.[24]

Tools and frameworks are an essential component for creating and engaging in risk communications. There have been several tools identified in the literature. The Rand Public Health Disaster Trust Scale Measurement tool helps to identify communities where there is a low amount of trust; can indicate communities for targeted communications and inclusion in community partnership.[25] The Crisis and Emergency Risk Communication (CERC) Toolkit published by the Centers for Disease Control and Prevention includes 12 modules which outline elements of a crisis, as well as the message development and audience research required to create public health risk communication plans.[26] The Theoretical Domains Framework (TDF) focuses on implementation; preserves theory throughout the process of creating communication plans which targets specific health behaviour change.[27] The Risk Communication on Social Media (RCSM) Model was created to help risk communicators in identifying factors that facilitate message passing in social networks in their specific context.[28] The Social media and Public Health Epidemic Response (SPHERE) Continuum characterizes the functions of social media across the epidemic-response continuum (i.e., first level is labeled social media as contagion, which refers to misinformation that can contribute to harm in the same way the disease can).[29] Health Communication at a Glance is a 12-step process for communicators to develop health communication initiatives; based on project management approach; includes sample worksheets and fillable documents.[30] It is clear that there is a wide variety of options available to risk communicators to strategically develop communication plans in the face of

COVID-19. However, it is less clear, how these frameworks may be relevant and applied to communications to equity-deserving populations.

As the impact of COVID-19 amplifies existing health inequalities, the importance of equity-informed social media responses to the COVID-19 pandemic is clear. The effectiveness of social media risk communication depends partly on meeting the specific communication needs of all populations-especially those most vulnerable to the risks and most likely to experience communication gaps. A previously conducted national survey from the Harvard School of Public Health and the CDC about beliefs about public health interventions for a hypothetical pandemic influenza revealed that beliefs about pandemics varied by socioeconomic circumstances, cultural background, and health status.[31] Employment security also impacts the level of adherence to risk reduction guidelines. For example, low-income, African American, and Hispanic individuals were more likely to believe that salary or job loss would result if they or a family member adhered to public health recommendations to stay at home during influenza pandemic.[32] The additional health risks faced by equity-deserving populations demand effective risk communications to help equity-deserving populations recognize and minimize risks and more effectively prevent and respond to COVID-19 infection and spread. Risk values, and perspectives on risk influence how individuals interpret health risk communications and how they behave in response,[14] not to mention circumstances and opportunities to enact public health measures in one's environment.

In Canada, the National Collaborating Centre for Methods and Tools previously conducted a rapid review that aimed to identify the best practices for risk communication and strategies to mitigate risk behaviours.[33] They sought to identify, appraise, and summarize

emerging research evidence to support evidence-informed decision making in response to the COVID-19 pandemic.[33] This rapid review identified that evidence is lacking for the experiences of many populations who live with social and structural inequities, such as Indigenous or other non-Caucasian people.[33] They called for further research to ensure representation of these populations in decision making of risk communications.[33]. Other studies have supported this call for targeting equity-deserving communities in COVID-19 risk communications, suggesting that the top-down (authority-imposed decision-making) risk communication process often fails to include low-income and marginalized populations.[34] This current study was initiated to address the traditional neglect of marginalised and other equity-deserving populations in COVID-19 risk communication.

A scoping review was selected to conduct this research because scoping reviews are ideal in identifying the available evidence in a field and the key characteristics or factors related to a concept i.e. social media risk communications.[35] Furthermore, scoping review supports our aim of identifying gaps in the literature.[35] This proposed scoping review aims to review the breadth and depth of the academic and grey literature on equity-informed social media risk communication tools to provide guidance on promising practices and principles for reaching equity-deserving populations through social media. This review specifically focuses on social media due to its ease and reach as a communication method along with the threat it poses to global public health due to misinformation and credibility issues. The objectives of this scoping review are as follows:

- To review the breadth and depth of the academic and grey literature on equity-informed social media risk communication tools in response to COVID-19.

- To explore how evidence-based recommendations about COVID-19 risk have been tailored for equity-deserving populations including facilitators and barriers to the development of tailored messaging.
- To provide guidance on promising practices and principles for reaching equity-deserving populations through social media.
- To identify gaps in the literature.

METHODS AND ANALYSIS

This scoping review follows the methodological framework described by Arksey and O'Malley which comprises five stages: (1) identifying the research question, (2) identifying relevant studies, (3) study selection, (4) charting the data, (5) collating, summarizing, and reporting the results and (6) consultation.[36,37] The database search of this review began in January 2022 with an expected completion of study selection in June 2022 and a completed review in October 2022.

Stage 1: Identifying the research question

The scoping review is guided by the following research question:

1) How did health agencies and community organizations produce social media risk communications and strategies regarding COVID-19 to equity-deserving populations?
2) What are effective practices and principles for providing equity-informed social media risk communications?

Stage 2: Identifying relevant literature

We had ongoing consultations with a scoping review specialist librarian, who assisted in developing the search strategy including the key words and identifying relevant databases. The search strategy included pertinent and comprehensive search terms that represent the primary concepts of this scoping review's objectives. These consist of keywords and MeSH terms, as well as combinations of these terms using Boolean operators. The search strategy and keywords have been adjusted for each database and website (See supplementary file 1). An electronic search was conducted using the following databases which were selected in consultation with a librarian:

- CINAHL Complete
- MEDLINE (OVID)
- Business Source Complete
- EMBASE database **OVID**
- Scopus
- PubMed's curated COVID-19 literature hub: Lit Covid

Grey literature from health organizations with relevance to the focus of our research (e.g., risk communications, equity) was included. A list of relevant grey literature sources has been informed by a rapid review focusing on risk communication.[33] These websites include:

- World Health Organization's Global literature on coronavirus disease
- NCCDH Equity-informed Responses to COVID-19
- Public Health +
- COVID-19 Living Overview of the Evidence (L·OVE)
- NCCEH Environmental Health Resources for the COVID-19 Pandemic
- NCCIH Updates on COVID-19

The search terms used to search the academic literature were used to identify relevant documents from these national organizational websites and national evidence hubs. Links to potentially relevant publications were extracted for further screening by two researchers.

Stage 3: Literature selection

Eligibility criteria: We will include articles that meet all the inclusion criteria as listed in Table 2. In addition to excluding publications that do not meet the inclusion criteria, we will exclude any articles that focus solely on risk communication without consideration of equity. We will also exclude articles that do not discuss social media within the context of a public health response to COVID-19. Articles before 2019 will be excluded as COVID-19 was declared an epidemic in 2019 and it is unlikely that there were any publications on the topic of concern in this scoping review. Due to resources limitations, we will only be including articles written in English.

Table 2: Inclusion and Exclusion Criteria

	Inclusion Criteria	**Exclusion Criteria**
Population	Equity-deserving populations (marginalized populations, vulnerable populations, minorities, at-risk populations, communities experiencing stigma, discrimination, inequality, inequity,)	General population
Concept	Risk communication through social media (e.g., communication about COVID-19 risks and events, instructions on how to change behaviour to mitigate risks, motivating compliance and addressing false information)	Risk communication through non-social media such as broadcast news (TV, radio), and print media (newspapers, magazines)
Context	COVID-19	Other infectious diseases such as HIV and Ebola
Type of study	All study types will be included: peer-reviewed journal articles, non-governmental organisation reports and academic dissertations.	No criteria
Study Design	All study designs will be considered including cross-sectional qualitative and quantitative studies, randomised controlled trials, and quasi-experimental designs editorials, commentaries, and pilot studies.	No criteria
Language	Evidence published in English	Non-English sources
Time	After 2019 to 2022	Before 2019

All references will be exported to reference manager software, COVIDENCE, to organize citations and remove duplicates. Title and abstract review will be conducted by two researchers. The full text of the selected article will be further screened against the inclusion criteria by two researchers. After a pilot screening process, any discrepancies will be discussed among the researchers until consensus is reached. Where necessary, discrepancies will be resolved through consultation with a third reviewer. The reference lists of included articles will be searched (reverse citation), along with a forward citation search in the Scopus database. The results of the screening process will be reported using the PRISMA-ScR guidelines.[33]

Stage 4: Charting the data

A data charting table will be used to extract data systematically from the included articles. This data extraction table was developed in accordance with the objectives of our scoping review, as well as discussions among members of our research team to ensure that we identify all relevant information. The data extracted from all included documents will include the following: (1) title (2) author(s), (3) year of publication, (4) type of document, (5) countries or regions studied, (6) aim or study purpose, (7) methodology, (8) type(s) of social media discussed, (9) target population (10) key findings (process, principles, practices) (11) frameworks discussed (12) recommendations (13) limitations of study. Two researchers will complete the data extraction and a third researcher will review the ongoing data extraction to determine if adjustments need to be made. The data extraction table will be changed and adapted during the process of gathering information from the included articles as necessary, and all modifications made will be explained fully in the final review.

Stage 5: Collating, summarising, and reporting of results

Results from this scoping review will be presented as a descriptive summary of the results from all included papers. This summary will describe the breadth and depth of the academic and grey literature on equity-informed social media risk communication tools in response to COVID-19. We will also conduct a thematic analysis utilizing the phased process delineated by Braun and Clark. [38,39,40] by inductively organizing the charted data into descriptive themes which closely reflect the content from the selected studies. Phase one involves familiarisation with the data by the entire dataset to identify appropriate information that may be relevant to the research questions.[38] In phase two, initial codes which will include shorthand descriptive labels for pieces of information that may be of relevance to the research questions will be generated.[39] In phase three, themes will be generated by combining codes with shared meanings.[39] At phase four, all authors will meet to discuss the themes and whether they provide meaningful interpretations of the data.[39, 40] In phase five, themes will be named and defined.

Stage 6: Consultation

This review is part of a project titled Depending on the Third Sector for Effective and Just Pandemic Prevention Communication to Vulnerable Populations. Results will be discussed with representatives from health agencies and community organizations with a mandate to service equity-deserving individuals and families.

Patient and public involvement

Patients and Public were not involved in the design and conduct of this study. Health agencies and community organisations will be involved by informing plans for dissemination of the study results to equity-deserving communities as part of the consultation phase of this scoping review.

ETHICS AND DISSEMINATION

As the scoping review methodology consists of reviewing and collecting data from publicly available materials, this study does not require ethics approval.

We intend to disseminate the results through publication in an open-access peer-reviewed journal, conference presentations, lay summaries for health organizations and messages to be shared through social media. We will publish the results of this review in a public health or health services research journal to maximize knowledge translation to social scientists and health services researchers pursuing research on health equity.

DISCUSSION

This scoping review will map the breadth and depth of the academic and grey literature on equity-informed social media risk communication tools, practices, and principles to provide guidance on promising practices for social media covid risk communications to mitigate risk behaviors in equity-deserving populations during a pandemic. We anticipate that this scoping review will also aid organisations in determining how to tailor risk communications to target populations during non-emergency times. Failure to communicate risks and risk mitigating interventions/behaviours might perpetuate existing inequities experienced by some populations.

ACKNOWLEDGEMENTS

We thank the scoping review specialist librarian at Western University who assisted in developing the search strategy and identifying relevant databases.

DATA MANAGEMENT AND OVERSIGHT

Two members of the research team will complete the literature search and screen them for inclusion criteria. A third researcher will review this screening process. All researchers will extract and analyze the data.

DATA STORAGE AND SECURITY

The database for the scoping review can be accessed by contacting the corresponding author.

AUTHOR STATEMENT

LC and AK contributed to the conceptualization of this study and acquiring funding. NP led the development of the study design and search strategy. LC, AK and NP contributed to the design of the study and revising drafts for interdisciplinary intellectual content.

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CONFLICTS OF INTERESTS

None declared.

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40. Braun, V., Clarke, V.: One size fits all? What counts as quality practice in (reflexive) thematic analysis? *Qual Res Psychol* 2021 Jul 3;18(3):328-52

Supplementary Material- Full search strategy

Database or Website	Search Strategy	Search Filter
Scopus	TITLE-ABS-KEY ("infectious disease*" OR COVID* OR pandemic* OR corona* OR "SARS*" OR "severe acute respiratory syndrome") AND TITLE-ABS-KEY ("social media" OR "Web 2.0" OR "social networking" OR twitter OR Instagram OR TikTok OR Facebook OR Reddit OR YouTube OR Snapchat OR LinkedIn OR Pinterest OR WhatsApp OR "social networking site*" or "online social network*" or "virtual world*" or "online communit*" or "online forum*") AND TITLE-ABS-KEY (equit* OR marginali* OR ((vulnerable OR underresourced OR "under resourced" OR underserved OR "underserved" OR "high risk") W/3 (individual* OR person* OR people OR population* OR group*)) OR BIPOC OR racis* OR indigenous OR Black OR minorit* OR ethnic* OR divers* OR inclusion* OR Accesibil* OR "disabled person*" OR "sexual and gender minorities" OR "health care disparities") AND TITLE-ABS-KEY (campaign OR "risk communication*" OR engagement OR outreach OR advocacy OR prevention OR engagement OR education OR "health promotion" OR awareness OR marketing)'.	Timeline: Articles published from 2019 to 2022 Language: Articles published in English
Lit Covid	TITLE-ABS-KEY ("infectious disease*" OR COVID* OR pandemic* OR corona* OR "SARS*" OR "severe acute respiratory syndrome") AND TITLE-ABS-KEY ("social media" OR "Web 2.0" OR "social networking" OR twitter OR Instagram OR TikTok OR Facebook OR Reddit OR YouTube OR Snapchat OR LinkedIn OR Pinterest OR WhatsApp OR "social networking site*" or "online social network*" or "virtual world*" or "online communit*" or "online forum*") AND TITLE-ABS-KEY (equit* OR marginali* OR ((vulnerable OR underresourced OR "under resourced" OR underserved OR "underserved" OR "high risk") W/3 (individual* OR person* OR people OR population* OR group*)) OR BIPOC OR racis* OR indigenous OR Black OR minorit* OR ethnic* OR divers* OR inclusion* OR Accesibil* OR "disabled person*" OR "sexual and gender minorities" OR "health care disparities") AND TITLE-ABS-KEY (campaign OR "risk communication*" OR engagement OR outreach OR advocacy OR prevention OR engagement OR education OR "health promotion" OR awareness OR marketing)'.	Timeline: Articles published from 2019 to 2022 Language: Articles published in English
CINHAL Complete	1. MH "COVID-19") OR (MH "SARS-CoV-2") OR (MH "COVID-19 Pandemic") OR (MH "COVID-19 Vaccines") OR (MH "Coronavirus Infections") OR (MH "Coronavirus") 2. 5(MH "Communicable Diseases") OR (MH "Infection Control") 3. (MH "Influenza, Pandemic (H1N1) 2009") OR (MH "Disease Outbreaks") 4. ("infectious disease*" or COVID* or pandemic* or corona* or "SARS*" or "severe acute respiratory syndrome").mp 5. S1 OR S2 OR S3 OR 4 6. (MH "Social Media") OR (MH "Facebook") OR (MH "Twitter") 7. (MH "Online Social Networking") 8. (MH "Blogs") 9. ("social media" or "Web 2.0" or "social networking" or twitter or Instagram or TikTok or Facebook or Reddit or YouTube or Snapchat or LinkedIn or Pinterest or Whatsapp or "social networking site*" or "online social network*" or "virtual world*" or "online communit*" or "online forum*").mp. 10. S6 OR S7 OR S8 OR S9	Timeline: Articles published from 2019 to 2022 Language: Articles published in English

	11. (MH "Racial Equality") OR (MH "Gender Equality") OR (MH "Social Justice") 12. (MH "Minority Groups") OR (MH "Immigrants") OR (MH "Ethnic Groups+") OR (MH "Disabled") OR (MH "Sexual and Gender Minorities") OR (MH "Women") 13. (MH "Healthcare Disparities") OR (MH "Health Services Accessibility") 14. (MH "Discrimination+") 15. (MH "Social Inclusion") OR (MH "Vulnerability") OR (MH "Stigma") OR (MH "Prejudice") OR (MH "Ageism") OR (MH "Racism") OR (MH "Gender Equality") OR (MH "Racial Equality") OR (MH "Homophobia") OR (MH "Sexism") 16. (MH "Special Populations") OR (MH "Rural Population") OR (MH "Urban Population") 17. (MH "Medically Underserved") OR (MH "Minority Groups") 18. (MH "Young Adult") 19. equit* OR marginali* OR vulnerable OR underresourced OR "under resourced" OR underserved OR "under served" OR "high risk" 20. ((vulnerable or underresourced or "under resourced" or underserved or "under served" or "high risk") W3 (individual* or person* or people or population* or group*)). 21. S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 22. (MH "Health Promotion") 23. (MH "Social Marketing") 24. (MH "Health Education") 25. campaign OR "risk communication*" OR engagement OR outreach OR advocacy OR prevention OR engagement OR education OR "health promotion" OR awareness OR marketing 26. S22 OR S23 OR S24 OR S25 27. S5 AND S10 AND S21 AND S26	
EMBASE database OVID	1. exp coronavirus disease 2019/ or coronavirus infection/ 2. exp pandemic/ or exp pandemic influenza/ or exp influenza/ 3. infection/ 4. exp severe acute respiratory syndrome/ or coronavirus infection/ or virus pneumonia/ 5. ("infectious disease*" or COVID* or pandemic* or corona* or "SARS*" or "severe acute respiratory syndrome").mp 6. 1 or 2 or 3 or 4 or 5 7. exp social media/ 8. online social network/ or social network analysis/ 9. exp social network/ 10. ("social media" or "Web 2.0" or "social networking" or twitter or Instagram or TikTok or Facebook or Reddit or YouTube or Snapchat or LinkedIn or Pinterest or Whatsapp or "social networking site*" or "online social network*" or "virtual world*" or "online communit*" or "online forum*").mp. 11. 7 or 8 or 9 or 10 12. exp health equity/ or exp gender equity/ 13. gender bias/ or gender identity/ 14. high risk population/ or rural population/ or susceptible population/ or urban population/ or vulnerable population/ 15. exp indigenous people/ 16. minority health/ or minority group/ or "sexual and gender minority"/	Timeline: Articles published from 2019 to 2022 Language: Articles published in English

	17. health disparity/ or LGBTQIA+ people/ or ethnic group/ 18. medically underserved/ 19. exp disabled person/ 20. equit* or marginali* or ((vulnerable or underresourced or "under resourced" or underserved or "under served" or "high risk") adj3 (individual* or person* or people or population* or group*))).mp. 21. 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 22. exp health promotion/ or health education/ or public health campaign/ or exp health promotion model/ 23. public health/ 24. (campaign or "risk communication*" or engagement or outreach or advocacy or prevention or engagement or education or "health promotion" or awareness or marketing).mp. 25. 22 or 23 or 24 26. 6 and 11 and 21 and 25	
Medline (OVID)	1. COVID-19/ 2. COVID-19 Vaccines/ or COVID-19 Testing/ 3. ("infectious disease*" or COVID* or pandemic* or corona* or "SARS*" or "severe acute respiratory syndrome").mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] 4. 1 or 2 or 3 5. blogging/ or social media/ 6. social networking/ or online social networking/ 7. social networking/ or online social networking/ 8. ("social media" or "Web 2.0" or "social networking" or twitter or Instagram or TikTok or Facebook or Reddit or YouTube or Snapchat or LinkedIn or Pinterest or Whatsapp or "social networking site*" or "online social network*" or "virtual world*" or "online communit*" or "online forum*").mp. 9. 5 or 6 or 7 or 8 10. Health Equity/ or Gender Equity/ 11. Healthcare Disparities/ 12. health status disparities/ 13. social discrimination/ or social inclusion/ or social marginalization/ or social stigma/ 14. Vulnerable Populations/ 15. (equit* or marginali* or vulnerable or underresourced or "under resourced" or underserved or "under served" or "high risk").mp. 16. ethnic groups/ or indigenous peoples/ or "sexual and gender minorities"/ or intersex persons/ or transgender persons/ 17. Minority Groups/ 18. exp Disabled Persons/ 19. rural population/ or urban population/ 20. Adolescent/ 21. prejudice/ or homophobia/ or racism/ or sexism/ 22. (equit* or marginali* or BIPOC or racis* or indigenous or Black or minorit* or ethnic* or divers* or inclusion* or Accesibil* or disabled person*).mp. 23. ((vulnerable or underresourced or "under resourced" or underserved or "under served" or "high risk") adj3 (individual* or person* or people or population* or group*)).mp.	Timeline: Articles published from 2019 to 2022 Language: Articles published in English

	24. 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 25. Health Promotion/ or Health Communication/ or Health Education/ 26. Health Knowledge, Attitudes, Practice/ 27. "Marketing of Health Services"/ 28. Social Marketing/ 29. (prevention or engagement or education or "health promotion" or awareness or marketing).mp. campaign or "risk communication*" or engagement or outreach or advocacy or [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] 30. 25 or 26 or 27 or 28 or 29 31. 4 and 9 and 24 and 30	
Business Source complete	"infectious disease*" OR COVID* OR pandemic* OR corona* OR "SARS*" OR "severe acute respiratory syndrome" AND "social media" OR "Web 2.0" OR "social networking" OR twitter OR Instagram OR TikTok OR Facebook OR Reddit OR YouTube OR Snapchat OR LinkedIn OR Pinterest OR WhatsApp OR "social networking site*" or "online social network*" or "virtual world*" or "online communit*" or "online forum*" AND equit* OR marginali* OR ((vulnerable OR underresourced OR "under resourced" OR underserved OR "underserved" OR "high risk") W/3 (individual* OR person* OR people OR population* OR group*)) OR BIPOC OR racis* OR indigenous OR Black OR minorit* OR ethnic* OR divers* OR inclusion* OR Accesibil* OR “disabled person*” OR “sexual and gender minorities” OR “health care disparities” AND campaign OR "risk communication*" OR engagement OR outreach OR advocacy OR prevention OR engagement OR education OR "health promotion" OR awareness OR marketing	Timeline: Articles published from 2019 to 2022 Language: Articles published in English
World Health Organization’s Global literature on coronavirus disease	"infectious disease*" OR COVID* OR pandemic* OR corona* OR "SARS*" OR "severe acute respiratory syndrome" AND "social media" OR "Web 2.0" OR "social networking" OR twitter OR Instagram OR TikTok OR Facebook OR Reddit OR YouTube OR Snapchat OR LinkedIn OR Pinterest OR WhatsApp OR "social networking site*" or "online social network*" or "virtual world*" or "online communit*" or "online forum*" AND equit* OR marginali* OR ((vulnerable OR underresourced OR "under resourced" OR underserved OR "underserved" OR "high risk") W/3 (individual* OR person* OR people OR population* OR group*)) OR BIPOC OR racis* OR indigenous OR Black OR minorit* OR ethnic* OR divers* OR inclusion* OR Accesibil* OR “disabled person*” OR “sexual and gender minorities” OR “health care disparities” AND campaign OR "risk communication*" OR engagement OR outreach OR advocacy OR prevention OR engagement OR education OR "health promotion" OR awareness OR marketing	Timeline: Articles published from 2019 to 2022 Language: Articles published in English

NCCDH Equity-informed Responses to COVID-19 (	Hand search for resources by topic: • Access to health services • Addressing misinformation • Communicate • Community engagement • Infectious disease • Multilingual information • Pandemic / emergency planning • Pandemic recovery • Socioeconomic status • Stigma, discrimination • Vaccination	Timeline: Articles published from 2019 to 2022 Language: Articles published in English
Public Health +	Hand search of all articles 2019-2022	Timeline: Articles published from 2019 to 2022 Language: Articles published in English
COVID-19 Living Overview of the Evidence (L·OVE)	("infectious disease*" OR COVID* OR pandemic* OR corona* OR "SARS*" OR "severe acute respiratory syndrome") AND ("social media" OR "Web 2.0" OR "social networking" OR twitter OR Instagram OR TikTok OR Facebook OR Reddit OR YouTube OR Snapchat OR LinkedIn OR Pinterest OR WhatsApp OR "social networking site*" or "online social network*" or "virtual world*" or "online communit*" or "online forum*") AND (equit* OR marginali* OR ((vulnerable OR underresourced OR "under resourced" OR underserved OR "underserved" OR "high risk") W/3 (individual* OR person* OR people OR population* OR group*)) OR BIPOC OR racis* OR indigenous OR Black OR minorit* OR ethnic* OR divers* OR inclusion* OR Accesibil* OR “disabled person*” OR “sexual and gender minorities” OR “health care disparities”) AND (campaign OR "risk communication*" OR engagement OR outreach OR advocacy OR prevention OR engagement OR education OR "health promotion" OR awareness OR marketing)	Timeline: Articles published from 2019 to 2022 Language: Articles published in English
NCCEH Environmental Health Resources for the COVID-19 Pandemic	Hand search for articles by topic: • Risk Communication • Health Equity	Timeline: Articles published from 2019 to 2022 Language: Articles published in English

NCCIH Updates on COVID-19	Hand search of all articles 2019-2022	Timeline: Articles published from 2019 to 2022 Language: Articles published in English

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
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.	2-3
INTRODUCTION			
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.	4-7
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.	8
METHODS			
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.	n/a
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.	10-11
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.	9-10
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	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.	9-12
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.	11
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	8
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.	12
RESULTS			
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
DISCUSSION			
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.	n/a
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
FUNDING			
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.	18

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).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.

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BMJ Open

The use of equity-informed social media COVID-19 risk communication tools. A Scoping Review Protocol

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2022-061851.R2
Article Type:	Protocol
Date Submitted by the Author:	14-Sep-2022
Complete List of Authors:	Kothari, Anita; Western University, Faculty of Health Studies Peter, Nedra; University of Western Ontario, Donelle, Lorie; Western University Arthur Labatt Family School of Nursing, Health Studies
Primary Subject Heading:	Public health
Secondary Subject Heading:	Communication, Infectious diseases
Keywords:	COVID-19, PUBLIC HEALTH, Risk management < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Protocols & guidelines < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Health & safety < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Infection control < INFECTIOUS DISEASES

The Use of Equity-Informed Social Media COVID-19 Risk Communication Tools. A Scoping Review Protocol

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Keywords: COVID-19, PUBLIC HEALTH, Risk management, Protocols & guidelines, Health & safety, Infection control

Word count: 3724

ABSTRACT

Introduction: Health agencies and community organizations play a crucial role in disseminating information to the public about COVID-19 risks and events, instructions on how to change behavior to mitigate those risks, motivating compliance with health directives and addressing false information. Social media platforms are a critical tool in risk communication, providing a medium for rapid transmission of messages as well as providing the opportunity for engagement and immediate feedback. Access to health information, services and support are especially important for marginalized and underserved ("equity-deserving") populations who are disproportionately affected by COVID-19. This scoping review aims to review the breadth and depth of the academic and grey literature on equity-informed social media risk communication tools to provide guidance on promising practices and principles for reaching equity-deserving populations through social media.

Methods and analysis: Arksey and O'Malley's (2005) framework guided the identification of the research question; identification and selection of relevant studies from electronic databases and hand-searches of discipline-specific journals; extraction and charting of the data; and collating and reporting of findings. The results of the screening process will be reported using the PR-ISMA-ScR guidelines.

Findings: We will identify reported facilitators and barriers to the development of risk communications that target equity-deserving communities. We will also identify recommendations for equity-informed risk communication for COVID-19.

Ethics and Dissemination: This study does not require ethics approval. We intend to disseminate the results through publication in an open-access peer-reviewed journal, conference presentations, lay summaries (e.g., checklists) for health organizations and messages to be shared through social media.

ARTICLE SUMMARY

Strengths and limitations of this study

- The proposed scoping review addresses the need for a comprehensive review of social media risk communication tools directed to equity-deserving populations who are disproportionately affected by COVID-19.
- A comprehensive search strategy has been developed in consultation with a librarian to maximize heterogeneity of results, including forward and reverse citations and a grey literature search.
- This scoping review will include a consultation phase with stakeholders from community organizations who work with equity deserving communities.
- This review will be limited to 2019 and beyond to capture specific references to COVID-19.

INTRODUCTION

Inequalities in access to the highest standard of physical and mental health between specific population groups have been well-documented.[1] Evidence shows that social factors such as education, employment status, income level, gender, race, and ethnicity influence how healthy a person is.[2, 3] Long-standing structural factors also have an effect on health disparities among some population groups due to differences in living conditions, education, health literacy, neighbourhood and build environment, socioeconomic status, discrimination, immigration status, cultural barriers, economic challenges, risk perceptions.[3]

In this paper we make the intentional choice to refer to communities who are experiencing marginalisation, stigma, discrimination, inequality, inequity, and other barriers to participating in society due to their race, ethnicity, ability, gender, sexuality, economic status and/or migration status, as “equity-deserving”. Due to long-standing inequalities and unique barriers experienced by equity-deserving populations, there is evidence to suggest that certain groups are more impacted by the COVID-19 pandemic than other populations due to their occupational, social, economic, and other health and life circumstances.[4] A current concern is the mortality and morbidity effects of the COVID-19 pandemic on marginalized and underserved populations.[4]

Some groups disproportionately affected by COVID-19 include, but are not exclusive to, women,[5] Indigenous populations,[6] racial and ethnic minorities,[7] sexual and gender minorities,[8] people experiencing poverty and people experiencing homelessness.[5] These equity-deserving groups are at risk in a variety of ways. For women experiencing homelessness, lockdowns and closure of services have increased their risk of experiencing intimate partner

violence and inability to turn to supports.[5] Women engaging in sex work are at higher risk due to the physical proximity required for their occupation.[4] Indigenous populations lack of access to running water at reserves and housing instability makes it difficult for community members to socially isolate, wash their hands, and practice other COVID-19 preventative measures.[6] In 2020, The Innovative Research Group (INNOVATIVE) found that over half of households (53%) identifying as LGBTQI2S were impacted by reduced employment hours or layoffs due to the pandemic compared to 39% of non-LGBTQI2S households.[8] Racialized persons are also more likely to live in multi-generational and crowded households, which makes it difficult to practice social distancing and isolate from family members who are elderly or who may have underlying co-morbidities.[7] They are also at higher risk for being evicted and becoming homeless.[7] People experiencing homelessness are at increased risk of infection with COVID-19 due to their lack of safe housing and difficult to adhere to public health directives such as physical distancing, isolation, and quarantine.[5] In addition equity-deserving populations can be more vulnerable in pandemic or emergency situation due to factors such as their lack of access to effective surveillance and early-warning systems, and health services.[9]

Risk communications and social media

Health agencies and organizations play a crucial role in the disseminating of information to the public about COVID-19 risks and events, providing instructions on how to change behavior to mitigate those risks, motivating compliance with health directives and addressing false information. Risk communication is a critical tool in response to different pandemic consequences, as it aims to establish public and professional awareness and confidence.[10,11] Risk communication entails the systematic dissemination of information to diverse audiences

(e.g., individuals, communities, and institutions) facilitating their informed, independent decision making about the existence, nature, and/or severity of risks and hazards affecting health, safety, and the environment.[12] Risk communication also involves the two-way exchange of information between interested parties to make decisions about how to best manage risks.[11]

Social media platforms are a critical tool in risk communication, providing an online medium for rapid transmissions of messages as well as providing the opportunity for engagement and immediate feedback.[13] Social media sites come in a variety of forms which provide different features for users, such as social networking, professional networking, media sharing, content production and knowledge/information aggregation (see Table 1). Social media is increasingly used for public health and health promotion due to its potential to engage with audiences for enhanced and quick communication and improved capacity to promote programs, products, and services.[14,15] Social media may also be used by health organisations to market insights, establish a brand and create brand awareness, disseminate critical information, expand reach to more diverse audiences, and foster public engagement and partnerships.[15] Twitter is seen as especially popular in the context of public health crises due to its ability to promote rapid dissemination and results in the spread of user generated content.[16]

Table 1: Social Media Sites Used by Healthcare Organisations

Function	**Description**	**Examples**
Social network	'Web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site.'' [17]	Facebook, Myspace, Google Plus, Twitter, Snapchat
Professional network	Sites which provide the opportunity for professionals to participate in online communities, listen to experts, and network and communicate with colleagues.	LinkedIn
Media Sharing /Social Network	Media-sharing sites offer a large selection of social media tools that are optimized for viewing, sharing, and embedding digital media content	YouTube, Tik Tok

	on the Web. They also include features such as profiles, connections, comments, and private messaging.[18]	
Knowledge/information aggregation	A collaborative website that can be directly edited by anyone with access to the site.[18]	Wikipedia
Content Production-Blogs and Microblogs	Blogs are an open forum which provide the opportunity to publish large amounts of long-form information and the publication of video and audio material. Includes a comment function allowing for ongoing dialogue between the blogger and his or her audience.[19] Microblogs are web services that allows subscribers to send short messages to other subscribers.[18].	Tumblr, Blogger, Twitter

During the H1N1 pandemic of 2009 social media was shown to facilitate the monitoring and surveillance of disease levels and public concern.[20] Social media was also a key tool for risk communication during the Ebola outbreak, although researchers found a lack of understanding in the use of social media research in routine health communication practice of public health agencies.[21] In the context of COVID-19 it is clear that social media continues to play an important role. For example, Resendes examined public health risk communication via social media by provincial and local health authorities in Ontario during the COVID-19 pandemic.[22] They noted that this group of Ontarian governmental bodies focused on offering information and resources to the public, while providing updates about the spread of COVID-19 in the community but not on the impact of COVID-19 on vulnerable populations or on providing clarity on misinformation.[22] Anecdotally, Chesser et al. demonstrated the importance of increased public health information through trusted information channels and sources and suggest that public health experts versus the "government" are more trusted to develop solutions to the COVID-19 pandemic.[23] They further suggested that additional content about signs, symptoms and prevention strategies for COVID-19 should consistently be shared through community social media accounts.[23]

Despite the advantages of social media for communicating risk during health crisis, social media also has the potential to increase health inequities, as differences in access to

technology, culture and preferences might affect the uptake of risk communications.[14] Furthermore, the influence of social media and other digital platforms on the unfolding of the COVID-19 pandemic has demonstrated how the spread of misinformation is proving to be as much a threat to global public health as the virus itself.[24]

Tools and frameworks are an essential component for creating and engaging in risk communications. There have been several tools identified in the literature that guide social media for governments during health crisis (see Table 2).[25]

Table 2: Tools and Frameworks for Creating and Engaging in Risk Communications Through Social Media

Tool or Framework	**Description**
The Rand Public Health Disaster Trust Scale Measurement tool	Helps to identify communities where there is a low amount of trust; can indicate communities for targeted communications and inclusion in community partnership.[26]
The Crisis and Emergency Risk Communication (CERC) Toolkit	Published by the Centers for Disease Control and Prevention includes 12 modules which outline elements of a crisis, as well as the message development and audience research required to create public health risk communication plans.[27]

The Theoretical Domains Framework (TDF)	Focuses on implementation; preserves theory throughout the process of creating communication plans which targets specific health behaviour change.[28]
The Risk Communication on Social Media (RCSM) Model	Created to help risk communicators in identifying factors that facilitate message passing in social networks in their specific context.[29]
The Social Media and Public Health Epidemic Response (SPHERE) Continuum	Characterizes the functions of social media across the epidemic-response continuum (i.e., first level is labeled social media as contagion, which refers to misinformation that can contribute to harm in the same way the disease can).[30]
Health Communication at a Glance is	A 12-step process for communicators to develop health communication initiatives; based on project management approach; includes sample worksheets and fillable documents.[31]

It is clear that there is a wide variety of options available to risk communicators to strategically develop communication plans in the face of COVID-19. However, it is less clear, how these frameworks may be relevant and applied to communications to equity-deserving populations.

As the impact of COVID-19 amplifies existing health inequalities, the importance of equity-informed social media responses to the COVID-19 pandemic is clear. The effectiveness of social media risk communication depends partly on meeting the specific communication needs

of all populations-especially those most vulnerable to the risks and most likely to experience communication gaps. A previously conducted national survey from the Harvard School of Public Health and the CDC about beliefs about public health interventions for a hypothetical pandemic influenza revealed that beliefs about pandemics varied by socioeconomic circumstances, cultural background, and health status.[32] Employment security also impacts the level of adherence to risk reduction guidelines. For example, low-income, African American, and Hispanic individuals were more likely to believe that salary or job loss would result if they or a family member adhered to public health recommendations to stay at home during influenza pandemic.[33] The additional health risks faced by equity-deserving populations demand effective risk communications to help equity-deserving populations recognize and minimize risks and more effectively prevent and respond to COVID-19 infection and spread. Risk values, and perspectives on risk influence how individuals interpret health risk communications and how they behave in response,[14] not to mention circumstances and opportunities to enact public health measures in one's environment.

In Canada, the National Collaborating Centre for Methods and Tools previously conducted a rapid review that aimed to identify the best practices for risk communication and strategies to mitigate risk behaviours.[34] They sought to identify, appraise, and summarize emerging research evidence to support evidence-informed decision making in response to the COVID-19 pandemic.[34] This rapid review identified that evidence is lacking for the experiences of many populations who live with social and structural inequities, such as Indigenous or other non-Caucasian people.[34] They called for further research to ensure representation of these populations in decision making of risk communications.[34]. Other studies have supported this call for targeting equity-deserving communities in COVID-19 risk

communications, suggesting that the top-down (authority-imposed decision-making) risk communication process often fails to include low-income and marginalized populations.[35] This current study was initiated to address the traditional neglect of marginalised and other equity-deserving populations in COVID-19 risk communication.

A scoping review was selected to conduct this research because scoping reviews are ideal in identifying the available evidence in a field and the key characteristics or factors related to a concept i.e. social media risk communications.[36] Furthermore, scoping review supports our aim of identifying gaps in the literature.[36] This proposed scoping review aims to review the breadth and depth of the academic and grey literature on equity-informed social media risk communication tools to provide guidance on promising practices and principles for reaching equity-deserving populations through social media. This review specifically focuses on social media due to its ease and reach as a communication method along with the threat it poses to global public health due to misinformation and credibility issues. The objectives of this scoping review are as follows:

- To review the breadth and depth of the academic and grey literature on equity-informed social media risk communication tools in response to COVID-19.
- To explore how evidence-based recommendations about COVID-19 risk have been tailored for equity-deserving populations including facilitators and barriers to the development of tailored messaging.
- To provide guidance on promising practices and principles for reaching equity-deserving populations through social media.
- To identify gaps in the literature.

METHODS AND ANALYSIS

This scoping review follows the methodological framework described by Arksey and O'Malley which comprises five stages: (1) identifying the research question, (2) identifying relevant studies, (3) study selection, (4) charting the data, (5) collating, summarizing, and reporting the results and (6) consultation.[37,38] The database search of this review began in January 2022 with an expected completion of study selection in June 2022 and a completed review in October 2022.

Stage 1: Identifying the research question

The scoping review is guided by the following research question:

1) How did health agencies and community organizations produce social media risk communications and strategies regarding COVID-19 to equity-deserving populations?
2) What are effective practices and principles for providing equity-informed social media risk communications?

Stage 2: Identifying relevant literature

We had ongoing consultations with a scoping review specialist librarian, who assisted in developing the search strategy including the key words and identifying relevant databases. The search strategy included pertinent and comprehensive search terms that represent the primary concepts of this scoping review's objectives. These consist of keywords and MeSH terms, as well as combinations of these terms using Boolean operators. The search strategy and keywords have been adjusted for each database and website (See supplementary file 1). An electronic search was conducted using the following databases which were selected in consultation with a librarian:

- CINAHL Complete
- MEDLINE (OVID)
- Business Source Complete
- EMBASE database **OVID**
- Scopus
- PubMed's curated COVID-19 literature hub: Lit Covid

Grey literature from health organizations with relevance to the focus of our research (e.g., risk communications, equity) was included. A list of relevant grey literature sources has been informed by a rapid review focusing on risk communication.[33] These websites include:

- World Health Organization's Global literature on coronavirus disease
- NCCDH Equity-informed Responses to COVID-19
- Public Health +
- COVID-19 Living Overview of the Evidence (L·OVE)
- NCCEH Environmental Health Resources for the COVID-19 Pandemic
- NCCIH Updates on COVID-19

The search terms used to search the academic literature were used to identify relevant documents from these national organizational websites and national evidence hubs. Links to potentially relevant publications were extracted for further screening by two researchers.

Stage 3: Literature selection

Eligibility criteria: We will include articles that meet all the inclusion criteria as listed in Table 3. In addition to excluding publications that do not meet the inclusion criteria, we will exclude any articles that focus solely on risk communication without consideration of equity. We will also exclude articles that do not discuss social media within the context of a public health response to COVID-19. Articles before 2019 will be excluded as COVID-19 was declared an epidemic in 2019 and it is unlikely that there were any publications on the topic of concern in this scoping review. Due to resources limitations, we will only be including articles written in English.

Table 3: Inclusion and Exclusion Criteria

	Inclusion Criteria	**Exclusion Criteria**
Population	Equity-deserving populations (marginalized populations, vulnerable populations, minorities, at-risk populations, communities experiencing stigma, discrimination, inequality, inequity,)	General population
Concept	Risk communication through social media (e.g., communication about COVID-19 risks and events, instructions on how to change behaviour to mitigate risks, motivating compliance and addressing false information)	Risk communication through non-social media such as broadcast news (TV, radio), and print media (newspapers, magazines)
Context	COVID-19	Other infectious diseases such as HIV and Ebola
Type of study	All study types will be included: peer-reviewed journal articles, non-governmental organisation reports and academic dissertations.	No criteria
Study Design	All study designs will be considered including cross-sectional qualitative and quantitative studies, randomised controlled trials, and quasi-experimental designs editorials, commentaries, and pilot studies.	No criteria
Language	Evidence published in English	Non-English sources
Time	After 2019 to 2022	Before 2019

All references will be exported to reference manager software, COVIDENCE, to organize citations and remove duplicates. Title and abstract review will be conducted by two researchers. The full text of the selected article will be further screened against the inclusion criteria by two researchers. After a pilot screening process, any discrepancies will be discussed among the researchers until consensus is reached. Where necessary, discrepancies will be resolved through consultation with a third reviewer. The reference lists of included articles will be searched (reverse

citation), along with a forward citation search in the Scopus database. The results of the screening process will be reported using the PRISMA-ScR guidelines.[34]

Stage 4: Charting the data

A data charting table will be used to extract data systematically from the included articles. This data extraction table was developed in accordance with the objectives of our scoping review, as well as discussions among members of our research team to ensure that we identify all relevant information. The data extracted from all included documents will include the following: (1) title (2) author(s), (3) year of publication, (4) type of document, (5) countries or regions studied, (6) aim or study purpose, (7) methodology, (8) type(s) of social media discussed, (9) target population (10) key findings (process, principles, practices) (11) frameworks discussed (12) recommendations (13) limitations of study. Two researchers will complete the data extraction and a third researcher will review the ongoing data extraction to determine if adjustments need to be made. The data extraction table will be changed and adapted during the process of gathering information from the included articles as necessary, and all modifications made will be explained fully in the final review.

Stage 5: Collating, summarising, and reporting of results

Results from this scoping review will be presented as a descriptive summary of the results from all included papers. This summary will describe the breadth and depth of the academic and grey literature on equity-informed social media risk communication tools in response to COVID-19. We will also conduct a thematic analysis utilizing the phased process delineated by Braun and Clark. [38,39,40] by inductively organizing the charted data into descriptive themes which closely reflect the content from the selected studies. Phase one involves familiarisation with the data by

the entire dataset to identify appropriate information that may be relevant to the research questions.[39] In phase two, initial codes which will include shorthand descriptive labels for pieces of information that may be of relevance to the research questions will be generated.[40] In phase three, themes will be generated by combining codes with shared meanings.[40] At phase four, all authors will meet to discuss the themes and whether they provide meaningful interpretations of the data.[40,41] In phase five, themes will be named and defined.

Stage 6: Consultation

This review is part of a project titled Depending on the Third Sector for Effective and Just Pandemic Prevention Communication to Vulnerable Populations. Results will be discussed with representatives from health agencies and community organizations with a mandate to service equity-deserving individuals and families.

Patient and public involvement

Patients and Public were not involved in the design and conduct of this study. Health agencies and community organisations will be involved by informing plans for dissemination of the study results to equity-deserving communities as part of the consultation phase of this scoping review.

ETHICS AND DISSEMINATION

As the scoping review methodology consists of reviewing and collecting data from publicly available materials, this study does not require ethics approval.

We intend to disseminate the results through publication in an open-access peer-reviewed journal, conference presentations, lay summaries for health organizations and messages to be

shared through social media. We will publish the results of this review in a public health or health services research journal to maximize knowledge translation to social scientists and health services researchers pursuing research on health equity.

DISCUSSION

This scoping review will map the breadth and depth of the academic and grey literature on equity-informed social media risk communication tools, practices, and principles to provide guidance on promising practices for social media covid risk communications to mitigate risk behaviors in equity-deserving populations during a pandemic. We anticipate that this scoping review will also aid organisations in determining how to tailor risk communications to target populations during non-emergency times. Failure to communicate risks and risk mitigating interventions/behaviours might perpetuate existing inequities experienced by some populations.

ACKNOWLEDGEMENTS

We thank the scoping review specialist librarian at Western University who assisted in developing the search strategy and identifying relevant databases.

DATA MANAGEMENT AND OVERSIGHT

Two members of the research team will complete the literature search and screen them for inclusion criteria. A third researcher will review this screening process. All researchers will extract and analyze the data.

DATA STORAGE AND SECURITY

The database for the scoping review can be accessed by contacting the corresponding author.

AUTHOR STATEMENT

LD and AK contributed to the conceptualization of this study and acquiring funding. NP led the development of the study design and search strategy. LD, AK and NP contributed to the design of the study and revising drafts for interdisciplinary intellectual content.

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CONFLICTS OF INTERESTS

None declared.

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Supplementary Material- Full search strategy

Database or Website	Search Strategy	Search Filter
Scopus	TITLE-ABS-KEY ("infectious disease*" OR COVID* OR pandemic* OR corona* OR "SARS*" OR "severe acute respiratory syndrome") AND TITLE-ABS-KEY ("social media" OR "Web 2.0" OR "social networking" OR twitter OR Instagram OR TikTok OR Facebook OR Reddit OR YouTube OR Snapchat OR LinkedIn OR Pinterest OR WhatsApp OR "social networking site*" or "online social network*" or "virtual world*" or "online communit*" or "online forum*") AND TITLE-ABS-KEY (equit* OR marginali* OR ((vulnerable OR underresourced OR "under resourced" OR underserved OR "underserved" OR "high risk") W/3 (individual* OR person* OR people OR population* OR group*)) OR BIPOC OR racis* OR indigenous OR Black OR minorit* OR ethnic* OR divers* OR inclusion* OR Accesibil* OR "disabled person*" OR "sexual and gender minorities" OR "health care disparities") AND TITLE-ABS-KEY (campaign OR "risk communication*" OR engagement OR outreach OR advocacy OR prevention OR engagement OR education OR "health promotion" OR awareness OR marketing)'.	Timeline: Articles published from 2019 to 2022 Language: Articles published in English
Lit Covid	TITLE-ABS-KEY ("infectious disease*" OR COVID* OR pandemic* OR corona* OR "SARS*" OR "severe acute respiratory syndrome") AND TITLE-ABS-KEY ("social media" OR "Web 2.0" OR "social networking" OR twitter OR Instagram OR TikTok OR Facebook OR Reddit OR YouTube OR Snapchat OR LinkedIn OR Pinterest OR WhatsApp OR "social networking site*" or "online social network*" or "virtual world*" or "online communit*" or "online forum*") AND TITLE-ABS-KEY (equit* OR marginali* OR ((vulnerable OR underresourced OR "under resourced" OR underserved OR "underserved" OR "high risk") W/3 (individual* OR person* OR people OR population* OR group*)) OR BIPOC OR racis* OR indigenous OR Black OR minorit* OR ethnic* OR divers* OR inclusion* OR Accesibil* OR "disabled person*" OR "sexual and gender minorities" OR "health care disparities") AND TITLE-ABS-KEY (campaign OR "risk communication*" OR engagement OR outreach OR advocacy OR prevention OR engagement OR education OR "health promotion" OR awareness OR marketing)'.	Timeline: Articles published from 2019 to 2022 Language: Articles published in English
CINHAL Complete	1. MH "COVID-19") OR (MH "SARS-CoV-2") OR (MH "COVID-19 Pandemic") OR (MH "COVID-19 Vaccines") OR (MH "Coronavirus Infections") OR (MH "Coronavirus") 2. 5(MH "Communicable Diseases") OR (MH "Infection Control") 3. (MH "Influenza, Pandemic (H1N1) 2009") OR (MH "Disease Outbreaks") 4. ("infectious disease*" or COVID* or pandemic* or corona* or "SARS*" or "severe acute respiratory syndrome").mp 5. S1 OR S2 OR S3 OR 4 6. (MH "Social Media") OR (MH "Facebook") OR (MH "Twitter") 7. (MH "Online Social Networking") 8. (MH "Blogs") 9. ("social media" or "Web 2.0" or "social networking" or twitter or Instagram or TikTok or Facebook or Reddit or YouTube or Snapchat or LinkedIn or Pinterest or Whatsapp or "social networking site*" or "online social network*" or "virtual world*" or "online communit*" or "online forum*").mp. 10. S6 OR S7 OR S8 OR S9	Timeline: Articles published from 2019 to 2022 Language: Articles published in English

	11. (MH "Racial Equality") OR (MH "Gender Equality") OR (MH "Social Justice") 12. (MH "Minority Groups") OR (MH "Immigrants") OR (MH "Ethnic Groups+") OR (MH "Disabled") OR (MH "Sexual and Gender Minorities") OR (MH "Women") 13. (MH "Healthcare Disparities") OR (MH "Health Services Accessibility") 14. (MH "Discrimination+") 15. (MH "Social Inclusion") OR (MH "Vulnerability") OR (MH "Stigma") OR (MH "Prejudice") OR (MH "Ageism") OR (MH "Racism") OR (MH "Gender Equality") OR (MH "Racial Equality") OR (MH "Homophobia") OR (MH "Sexism") 16. (MH "Special Populations") OR (MH "Rural Population") OR (MH "Urban Population") 17. (MH "Medically Underserved") OR (MH "Minority Groups") 18. (MH "Young Adult") 19. equit* OR marginali* OR vulnerable OR underresourced OR "under resourced" OR underserved OR "under served" OR "high risk" 20. ((vulnerable or underresourced or "under resourced" or underserved or "under served" or "high risk") W3 (individual* or person* or people or population* or group*)). 21. S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 22. (MH "Health Promotion") 23. (MH "Social Marketing") 24. (MH "Health Education") 25. campaign OR "risk communication*" OR engagement OR outreach OR advocacy OR prevention OR engagement OR education OR "health promotion" OR awareness OR marketing 26. S22 OR S23 OR S24 OR S25 27. S5 AND S10 AND S21 AND S26	
EMBASE database OVID	1. exp coronavirus disease 2019/ or coronavirus infection/ 2. exp pandemic/ or exp pandemic influenza/ or exp influenza/ 3. infection/ 4. exp severe acute respiratory syndrome/ or coronavirus infection/ or virus pneumonia/ 5. ("infectious disease*" or COVID* or pandemic* or corona* or "SARS*" or "severe acute respiratory syndrome").mp 6. 1 or 2 or 3 or 4 or 5 7. exp social media/ 8. online social network/ or social network analysis/ 9. exp social network/ 10. ("social media" or "Web 2.0" or "social networking" or twitter or Instagram or TikTok or Facebook or Reddit or YouTube or Snapchat or LinkedIn or Pinterest or Whatsapp or "social networking site*" or "online social network*" or "virtual world*" or "online communit*" or "online forum*").mp. 11. 7 or 8 or 9 or 10 12. exp health equity/ or exp gender equity/ 13. gender bias/ or gender identity/ 14. high risk population/ or rural population/ or susceptible population/ or urban population/ or vulnerable population/ 15. exp indigenous people/ 16. minority health/ or minority group/ or "sexual and gender minority"/	Timeline: Articles published from 2019 to 2022 Language: Articles published in English

	17. health disparity/ or LGBTQIA+ people/ or ethnic group/ 18. medically underserved/ 19. exp disabled person/ 20. equit* or marginali* or ((vulnerable or underresourced or "under resourced" or underserved or "under served" or "high risk") adj3 (individual* or person* or people or population* or group*))).mp. 21. 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 22. exp health promotion/ or health education/ or public health campaign/ or exp health promotion model/ 23. public health/ 24. (campaign or "risk communication*" or engagement or outreach or advocacy or prevention or engagement or education or "health promotion" or awareness or marketing).mp. 25. 22 or 23 or 24 26. 6 and 11 and 21 and 25	
Medline (OVID)	1. COVID-19/ 2. COVID-19 Vaccines/ or COVID-19 Testing/ 3. ("infectious disease*" or COVID* or pandemic* or corona* or "SARS*" or "severe acute respiratory syndrome").mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] 4. 1 or 2 or 3 5. blogging/ or social media/ 6. social networking/ or online social networking/ 7. social networking/ or online social networking/ 8. ("social media" or "Web 2.0" or "social networking" or twitter or Instagram or TikTok or Facebook or Reddit or YouTube or Snapchat or LinkedIn or Pinterest or Whatsapp or "social networking site*" or "online social network*" or "virtual world*" or "online communit*" or "online forum*").mp. 9. 5 or 6 or 7 or 8 10. Health Equity/ or Gender Equity/ 11. Healthcare Disparities/ 12. health status disparities/ 13. social discrimination/ or social inclusion/ or social marginalization/ or social stigma/ 14. Vulnerable Populations/ 15. (equit* or marginali* or vulnerable or underresourced or "under resourced" or underserved or "under served" or "high risk").mp. 16. ethnic groups/ or indigenous peoples/ or "sexual and gender minorities"/ or intersex persons/ or transgender persons/ 17. Minority Groups/ 18. exp Disabled Persons/ 19. rural population/ or urban population/ 20. Adolescent/ 21. prejudice/ or homophobia/ or racism/ or sexism/ 22. (equit* or marginali* or BIPOC or racis* or indigenous or Black or minorit* or ethnic* or divers* or inclusion* or Accesibil* or disabled person*).mp. 23. ((vulnerable or underresourced or "under resourced" or underserved or "under served" or "high risk") adj3 (individual* or person* or people or population* or group*)).mp.	Timeline: Articles published from 2019 to 2022 Language: Articles published in English

	24. 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 25. Health Promotion/ or Health Communication/ or Health Education/ 26. Health Knowledge, Attitudes, Practice/ 27. "Marketing of Health Services"/ 28. Social Marketing/ 29. (prevention or engagement or education or "health promotion" or awareness or marketing).mp. campaign or "risk communication*" or engagement or outreach or advocacy or [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] 30. 25 or 26 or 27 or 28 or 29 31. 4 and 9 and 24 and 30	
Business Source complete	"infectious disease*" OR COVID* OR pandemic* OR corona* OR "SARS*" OR "severe acute respiratory syndrome" AND "social media" OR "Web 2.0" OR "social networking" OR twitter OR Instagram OR TikTok OR Facebook OR Reddit OR YouTube OR Snapchat OR LinkedIn OR Pinterest OR WhatsApp OR "social networking site*" or "online social network*" or "virtual world*" or "online communit*" or "online forum*" AND equit* OR marginali* OR ((vulnerable OR underresourced OR "under resourced" OR underserved OR "underserved" OR "high risk") W/3 (individual* OR person* OR people OR population* OR group*)) OR BIPOC OR racis* OR indigenous OR Black OR minorit* OR ethnic* OR divers* OR inclusion* OR Accesibil* OR “disabled person*” OR “sexual and gender minorities” OR “health care disparities” AND campaign OR "risk communication*" OR engagement OR outreach OR advocacy OR prevention OR engagement OR education OR "health promotion" OR awareness OR marketing	Timeline: Articles published from 2019 to 2022 Language: Articles published in English
World Health Organization’s Global literature on coronavirus disease	"infectious disease*" OR COVID* OR pandemic* OR corona* OR "SARS*" OR "severe acute respiratory syndrome" AND "social media" OR "Web 2.0" OR "social networking" OR twitter OR Instagram OR TikTok OR Facebook OR Reddit OR YouTube OR Snapchat OR LinkedIn OR Pinterest OR WhatsApp OR "social networking site*" or "online social network*" or "virtual world*" or "online communit*" or "online forum*" AND equit* OR marginali* OR ((vulnerable OR underresourced OR "under resourced" OR underserved OR "underserved" OR "high risk") W/3 (individual* OR person* OR people OR population* OR group*)) OR BIPOC OR racis* OR indigenous OR Black OR minorit* OR ethnic* OR divers* OR inclusion* OR Accesibil* OR “disabled person*” OR “sexual and gender minorities” OR “health care disparities” AND campaign OR "risk communication*" OR engagement OR outreach OR advocacy OR prevention OR engagement OR education OR "health promotion" OR awareness OR marketing	Timeline: Articles published from 2019 to 2022 Language: Articles published in English

NCCDH Equity-informed Responses to COVID-19 (	Hand search for resources by topic: • Access to health services • Addressing misinformation • Communicate • Community engagement • Infectious disease • Multilingual information • Pandemic / emergency planning • Pandemic recovery • Socioeconomic status • Stigma, discrimination • Vaccination	Timeline: Articles published from 2019 to 2022 Language: Articles published in English
Public Health +	Hand search of all articles 2019-2022	Timeline: Articles published from 2019 to 2022 Language: Articles published in English
COVID-19 Living Overview of the Evidence (L·OVE)	("infectious disease*" OR COVID* OR pandemic* OR corona* OR "SARS*" OR "severe acute respiratory syndrome") AND ("social media" OR "Web 2.0" OR "social networking" OR twitter OR Instagram OR TikTok OR Facebook OR Reddit OR YouTube OR Snapchat OR LinkedIn OR Pinterest OR WhatsApp OR "social networking site*" or "online social network*" or "virtual world*" or "online communit*" or "online forum*") AND (equit* OR marginali* OR ((vulnerable OR underresourced OR "under resourced" OR underserved OR "underserved" OR "high risk") W/3 (individual* OR person* OR people OR population* OR group*)) OR BIPOC OR racis* OR indigenous OR Black OR minorit* OR ethnic* OR divers* OR inclusion* OR Accesibil* OR “disabled person*” OR “sexual and gender minorities” OR “health care disparities”) AND (campaign OR "risk communication*" OR engagement OR outreach OR advocacy OR prevention OR engagement OR education OR "health promotion" OR awareness OR marketing)	Timeline: Articles published from 2019 to 2022 Language: Articles published in English
NCCEH Environmental Health Resources for the COVID-19 Pandemic	Hand search for articles by topic: • Risk Communication • Health Equity	Timeline: Articles published from 2019 to 2022 Language: Articles published in English

NCCIH Updates on COVID-19	Hand search of all articles 2019-2022	Timeline: Articles published from 2019 to 2022 Language: Articles published in English

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
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.	2-3
INTRODUCTION			
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.	4-7
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.	8
METHODS			
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.	n/a
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.	10-11
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.	9-10
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	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.	9-12
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.	11
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	8
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.	12
RESULTS			
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
DISCUSSION			
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.	n/a
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
FUNDING			
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.	18

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).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.

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