International Journal for Equity in Health

REVIEW

Open Access

The role of narratives in promoting vaccine confidence among Indigenous peoples in Canada, the United States, Australia, and New Zealand: a scoping review

Robert Martell[1], Maurianne Reade[2], Lisa Boesch[3], Davinder P. Kaur[4], Sandeep Kumar[4], Michael McArthur[5] and Marion A. Maar[3*]

Abstract

Background Many Indigenous youth and young adults in Canada, the United States, Australia, and New Zealand have reported low vaccine confidence, which has been linked to lower vaccination rates for COVID-19, MMR, HPV, DTaP-IPV-Hib, and pneumococcal conjugate vaccines. Narrative-based health promotion approaches, including those focused on strengthening vaccine confidence, have been used in public health interventions. Scoping reviews have become increasingly valued for their rigorous and reproducible exploration of evidence in public health research. The aim of this scoping review was to understand the extent and types of evidence related to the facilitators, challenges, and benefits of narrative-based health promotion approaches in vaccine confidence interventions within Indigenous populations.

Methods This review adhered to the Joanna Briggs Institute (JBI) guidelines for scoping reviews using Covidence online software to streamline the review process. Database searches were conducted in MEDLINE, Embase, Web of Science, PsycINFO, and PubMed, as well as Google search to identify both academic and gray literature articles on the role of narratives in promoting vaccine confidence published between January 2000 and April 2024. Charted data were ranked in a numerical summary and analyzed using qualitative content analysis. The review process embraced a two-eyed seeing approach.

Results The searches identified 306 records. After the screening process, 45 sources (35 peer-reviewed articles, eight gray literature, and two preprint articles) were included in the final review. The key facilitators of narrative-based approaches to promote vaccine confidence were community engagement, tailored and culturally safe interventions, and trusted messengers and sources of information. The challenges discussed in the literature were linked to mistrust of government and healthcare services and to misinformation narratives. The most frequently reported benefits were the development of community-based resources, culturally safe and relevant interventions, building trust and respectful relationships, and improved vaccination rates.

*Correspondence:
Marion A. Maar
mmaar@nosm.ca

Full list of author information is available at the end of the article

Conclusion This review confirmed the important contribution of narrative-based health promotion approaches in strengthening vaccine confidence among Indigenous populations. This finding underscores the importance of respecting Indigenous sovereignty and engaging community perspectives to repair trust and improve vaccination rates.

Keywords Narratives, Storytelling, Vaccine confidence, Two-eyed seeing, Indigenous populations, Health promotion, Cultural safety

Background

In countries with well-functioning healthcare systems, vaccines represent the pinnacle of technological innovation for reducing the impact of preventable diseases among human populations. Early smallpox vaccinations experiments can be traced back to 10th century China [1]. In 1796, a smallpox vaccine based on exposure to cowpox was discovered [2]. In the 20th century, concerted global immunization efforts eradicated smallpox as a major public health concern. Many contagious and debilitating childhood illnesses, such as measles, mumps, rubella, pertussis, polio, and diphtheria can now be effectively prevented. However, as these diseases recede from the forefront of the public's consciousness, some people have become indifferent or hesitant towards vaccinations, due to a perceived lack of risk [3].

Vaccine hesitancy is defined as the delay or refusal of being vaccinated despite the availability of vaccination services [4]. This complex phenomenon is characterized by the level of vaccine confidence, convenience, complacency, calculation, and collective responsibility [5]. Vaccine confidence refers to the degree of trust in the safety and effectiveness of vaccines, the systems that administer vaccines, and the motives of vaccine policy-makers. Convenience refers to the ease with which people can access vaccines and is influenced by factors such as affordability, scheduling, and the availability of vaccination services. Complacency involves indifference toward vaccination due to a low perceived perception of risks associated with vaccine-preventable diseases. Finally, calculation refers to seeking information and weighing the risks of infection versus vaccination, while collective responsibility is the willingness to protect others through one's own vaccination [5].

Since the late 1990s, vaccine hesitancy has increased in step with the steady increase in vaccine misinformation, including a now retracted research paper that declared a causal link between the measles, mumps, and rubella (MMR) vaccines and an increased risk of autism [6].

The recent trend of declining vaccination rates in some communities has raised concerns among public health authorities around the world [7–9]. This decline has been associated with outbreaks of highly contagious and preventable diseases, such as polio, measles, and pertussis. Low vaccine confidence and suboptimal vaccination rates significantly increase the vulnerability of communities to infectious diseases. In 2019, the World Health Organization (WHO) designated vaccine hesitancy as one of the top ten threats to global health [10]. The COVID-19 pandemic brought vaccination back to the forefront of the public's awareness, provoking extensive discussions marked by differing viewpoints. The politicization and polarization of vaccines, as well as the abundance of vaccine misinformation, have exacerbated concerns among certain segments of the population and even led to anti-vaccine movements.

There are additional layers of complexity when considering vaccine confidence among Indigenous peoples. In countries with a colonial history, low vaccine confidence among Indigenous peoples may be rooted in a lack of trust in government-run services due to historical oppression and medical experimentation by colonial governments as well as, ongoing economic and health inequities [11, 12]. Therefore, mainstream public health approaches to vaccine confidence in Indigenous communities require tailoring that "speaks to Indigenous Peoples' historical and contemporary experiences" [13 p. E382].

It is important to recognize that Indigenous cultures are diverse and that vaccination rates vary across countries, geographical regions, and age groups. During the early stages of the COVID-19 pandemic, many rural Indigenous communities in North America reported higher vaccination rates than did non-Indigenous communities [14, 15], whereas lower vaccination rates were observed in urban areas and among young adults [16, 17]. Lower vaccine coverage has also been reported in Indigenous communities in the United States (U.S.) and Australia for measles, mumps, and rubella (MMR), human papillomavirus (HPV), diphtheria, tetanus, pertussis, polio, and Haemophilus influenzae type b (DTaP-IPV-Hib), and pneumococcal conjugate vaccines, with Canada showing mixed results [18]. However, in Canada, incomplete data preclude an accurate assessment of First Nations vaccine coverage. In New Zealand, declining MMR vaccination coverage for Māori children has prompted urgent warnings from health authorities of likely outbreaks [19]. Therefore, it is vital to understand the factors that influence vaccine confidence to develop tailored interventions that improve vaccine uptake.

Narrative-based approaches in public health education that use the power of storytelling have shown promise in

health promotion efforts such as, smoking cessation [20], pain reduction in hospitalized children [21], and cancer screening [22]. Immersion in a narrative can be a powerful mechanism to convey persuasive messaging that can influence belief and health behaviors. Furthermore, storytelling is integral to many Indigenous cultures and is a culturally appropriate approach for health promotion strategies [23]. Storytelling strengthens Indigenous community bonds, validates experiences and ways of knowing, and facilitates the sharing of knowledge [24].

The goal of this scoping review was to examine the extent and types of evidence related to the role of narratives in promoting vaccine confidence among Indigenous populations in Canada, the U.S., Australia, and New Zealand. This study aimed to contribute to the broader discourse on vaccine confidence by advocating for community-based and culturally safe narrative interventions. The insights gleaned from this study may serve to inform healthcare practitioners and public health policy development for narrative-based efforts to strengthen vaccine confidence.

Methods

The research team adapted the methodology for this scoping review from the five-stage process outlined by Arksey & O'Malley in 2005 [25]. Enhancements to the scoping review process were proposed by Levac et al. in 2010 [26], with updated methodological guidance by Peters et al. in 2020 [27]. The JBI scoping review guidelines incorporate and expand upon these foundational frameworks to provide comprehensive guidance for conducting rigorous and transparent scoping reviews. This scoping review incorporated six steps: identifying research questions; identifying relevant studies; selecting studies; charting the data; collating, summarizing, and reporting the results; and consulting.

This review was guided by the two-eyed seeing theoretical framework. Two-eyed seeing is characterized by the use of the strengths of Indigenous *and* Western ways of knowing to benefit all [28]. The principles of two-eyed seeing assert that these knowledge systems should stand shoulder to shoulder, in equal terms, without either expressing dominance over one another [28]. Two-eyed seeing was incorporated into the review through monthly meetings with Indigenous advisors who provided cultural perspectives on all aspects of the review process. This approach ensured a comprehensive and culturally sensitive review of the literature.

PCC framework and eligibility criteria

The Population, Concept, Context (PCC) framework envisioned by the Joanna Briggs Institute (JBI) guided the development of the eligibility criteria for this scoping review [29]. This review included qualitative, quantitative, and mixed-methods study designs, and both gray literature and peer-reviewed academic articles were assessed using the same eligibility criteria.

The populations of interest were Indigenous Peoples in Canada, the U.S., Australia, and New Zealand. These included the First Nations, Métis, Inuit, American Indian, Alaskan Native, Māori, and Aboriginal and Torres Strait Islander People [30]. Sources that did not include Indigenous populations were excluded. Sources that grouped together Black, Indigenous, and People of Color (BIPOC) or did not separate data for Indigenous participants were also excluded.

The concept referred to the facilitators, challenges, and benefits of narrative-based strategies to promote vaccine confidence. Sources that lacked a narrative component were excluded. The reason for this exclusion was that this scoping review focused on the role of narratives in people's vaccine deliberations.

The context involved vaccine confidence among Indigenous Peoples in Anglosphere countries with similar colonial histories, namely Canada, the U.S., Australia, and New Zealand. Sources that did not discuss vaccination or vaccine confidence and sources set in Europe, Africa, and Asia were excluded. The justification for this decision was that Indigenous Peoples in the selected high-income countries have reported similar marginalization by colonial governments as well as disparities in government services, healthcare, and health outcomes.

Research question

The following research question was devised to guide this scoping review:

- What is known from the literature about the use of narrative-based approaches in public health to promote vaccine confidence within Indigenous communities?

This question was subdivided into three secondary research questions that explored the different facets (facilitators, challenges, and benefits) of narrative-based approaches to promote vaccine confidence:

- What has been reported to be a facilitator in implementing these narrative-based approaches?
- What has been reported to be a challenge in implementing these narrative-based approaches?
- What benefits related to vaccine confidence have been reported for these narrative-based approaches?

Identifying relevant studies

The expertise of a Northern Ontario School of Medicine University (NOSM U) Access Services librarian (MM) was sought to assist in identifying relevant databases and

Table 1 Characteristics of the included records on narrative-based efforts to promote vaccine confidence among Indigenous populations

Author, year, country	Publication type	Population	Study design	Objective
Gardiner et al., 2023, Australia [39]	Peer-reviewed, primary research	Rural and remote Aboriginal communities	Mixed-methods: VAS form and yarning	To describe the preparation and response phases of the Royal Flying Doctor Service (RFDS) COVID-19 response.
Gilchrist et al., 2021, New Zealand [70]	Peer-reviewed, primary research	Pregnant women with an expected due date between April 2009 and March 2010, and their partners.	Quantitative observational	To describe vaccination information received by fathers during pregnancy and paternal determinants of timely infant vaccinations
Haroz et al., 2022, U.S. [40]	Peer-reviewed	American Indian (AI) and Alaskan Native (AN) communities	Qualitative descriptive	To describe the factors and strategies that led to the successful COVID-19 vaccination efforts in AI/AN communities.
Ignacio et al., 2022, U.S. [11]	Peer-reviewed, primary research	African American/Black, American Indian/Alaska Native, and Hispanic/Latinx communities in Arizona	Mixed-methods: focus groups and survey	To understand factors associated with COVID-19 vaccine confidence, reduce disparities, and promote health equity.
Manca et al., 2022, Canada [76]	Peer-reviewed, primary research	Racialized minorities and Indigenous Peoples in Canada	Mixed-methods: survey and interviews	To explore COVID-19 vaccination intentions and concerns.
Mosby & Swidrovich, 2021, Canada [13]	Peer-reviewed	Indigenous (First Nations, Métis and Inuit) communities	Report	To report on the roots of COVID-19 vaccine hesitancy among Indigenous Peoples in Canada
Ortiz-Paredes et al., 2022, Canada [79]	Peer-reviewed, primary research	Incarcerated people in Canadian federal prisons	Qualitative descriptive	To better understand vaccine hesitancy in these high-risk settings, the authors explored reasons for COVID-19 vaccine refusal among inmates in federal prisons.
Sullivan et al., 2023, Canada [52]	Peer-reviewed, primary research	Star Blanket Cree Nation residents	Mixed-methods: social media analytics and sharing circles	To explore vaccine hesitancy among Indigenous people in a First Nation community in Saskatchewan, strategies to address it, and examining the impact of both colonial history and contemporary influences.
Thomas et al., 2022, Australia [53]	Peer-reviewed, primary research	Parents and health service providers.	Qualitative, semi-structured interviews and focus groups	To gain a deeper understanding of the reasons for low vaccine coverage.
Tutt et al., 2022, U.S. [41]	Peer-reviewed, primary research	Navajo Nation (NN), Arizona	Mixed-methods: Interviews and survey	To report on the adapted and tailored Diné Teachings and Public Health Students Informing Peers and Relatives about Vaccine Education (RAVE) intervention.
Dudgeon et al., 2023, Australia [80]	Peer-reviewed, primary research	Aboriginal and Torres Strait Islander mental health experts; community leaders; academics; service providers; representatives; and non-Indigenous colleagues	Qualitative: semi-structured and open discussions led by Aboriginal facilitators	To outline the national collaborative consultation process and summarize the key findings of the Close the Gap Priority Reforms roundtables final report during the COVID-19 pandemic.
Epperson et al., 2022, U.S. [81]	Peer-reviewed, primary research	Native American participants	Qualitative: focus groups	To better understand COVID-19 vaccine perceptions and to develop solutions that improve vaccine confidence and mitigate COVID-19 morbidity and mortality among Native Americans living in urban communities.
Graham et al., 2022, Australia [67]	Peer-reviewed, primary research	Aboriginal youth	Rapid qualitative assessment. Participatory peer-led researcher interviews	To examine what Aboriginal people think about COVID-19 vaccines, reasons why they were vaccinated, and factors involved in receiving COVID-19 vaccination.
Silberner, 2021, U.S. [15]	Peer-reviewed	American Indians (AI) and Alaska Natives (AN)	Report	To report on the success of Native American vaccination efforts.
Carson et al., 2021, U.S. [42]	Peer-reviewed, primary research	Participants identified as American Indian, Black/African American, Filipino/Filipina, Latino/Latina, or Pacific Islander.	Qualitative: focus groups	To explore factors in the decision-making process for COVID-19 vaccines that can inform public health policy for equitable vaccine distribution.
Yzer et al., 2018, U.S. [56]	Peer-reviewed, primary research	Parents of American Indian (AI) children	Quantitative: between-subjects randomized experiment	To test two hypotheses: (1) AI cultural message cues strengthen perceived effectiveness of HPV vaccination messages; (2) the degree message recipients identify with AI culture impacts effects on message identification and perceived effectiveness.

Table 1 (continued)

Author, year, country	Publication type	Population	Study design	Objective
Bowen et al., 2014, U.S. [68]	Peer-reviewed, primary research	Adolescent Native American (NA) girls aged 9 to 18 years old and NA parents and caregivers aged 18 to 64	Qualitative: focus groups	To understand cancer-screening practices among NA women living in rural and urban areas, and to identify cultural and environmental barriers related to HPV vaccine intentions and perceptions about cervical cancer screening.
Boyd & Buchwald, 2022, U.S. [54]	Peer-reviewed	American Indians (AI)	Commentary	To discuss factors that influence AI risk perceptions of COVID-19 vaccinations including the impact on Elders, community, and culture.
Gauld et al., 2022, New Zealand [64]	Peer-reviewed, primary research	Nine Māori women and nine Māori Health Care Providers (HCPs)	Qualitative: semi-structured interviews	To describe the experiences of Māori women regarding maternal pertussis and influenza vaccinations and investigate the factors influencing their uptake.
Carter Olson et al., 2022, U.S. [75]	Peer-reviewed, primary research	Indigenous women	Qualitative: thematic textual analysis of Indigenous media	To advance theoretical knowledge of Indigenous women's roles in COVID-19 coverage.
Eichelberger et al., 2022, U.S. [71]	Preprint, primary research	The majority of interview participants were women and most identified as American Indian or Alaskan Native.	Mixed-methods: survey and semi-structured interviews	To describe the decision-making process regarding the COVID-19 vaccine among 38 Alaskans who live in rural areas and are primarily female and Indigenous.
Ellenwood et al., 2023, U.S. [55]	Peer-reviewed, primary research	Thirty Nimiipuu people from the Nez Perce Reservation	Qualitative: semi-structured interviews	To provide a holistic view of risk perception factors and better understand how Native Americans perceive vaccines.
Villar, 2021, U.S. [59]	Peer-reviewed	Marginalized communities	Commentary	To share the authors experiences on projects in which community residents, academics, or other experts collaboratively created materials with tailored information.
Funnell et al., 2022, Canada [12]	Peer-reviewed	First Nations, Inuit and Métis peoples	Fact sheet	To understand how current best practices may influence the uptake of COVID-19 vaccines among Indigenous Peoples.
McDowell, 2024, U.S. [74]	Preprint, primary research	N/A	Qualitative: storytelling analysis	To examine three cases of COVID-19 misinformation with new storytelling theory.
King et al., 2022, Canada [43]	Peer-reviewed, primary research	Métis people living in Alberta	Case study	To describe the approach employed in Canada's first Métis-run COVID-19 vaccination center.
Power et al., 2020, Australia [97]	Peer-reviewed	Indigenous Peoples	Editorial	To explore current issues raised for Indigenous communities by the COVID-19 pandemic.
Kerrigan et al., 2023, Australia [44]	Peer-reviewed, primary research	First Nations leaders, Elders fluent in First Nations languages, and Northern Territory residents	Mixed-methods: interviews and social media analytics	To describe a collaborative research project, and to clarify the methods used in making COVID-19 vaccine videos for First Nations communities.
Driedger et al., 2013, Canada [45]	Peer-reviewed, primary research	First Nations and Métis people in Manitoba	Qualitative: focus groups and key informant interviews	To contextualize participant responses to H1N1 vaccine messaging, how priority groups for vaccination were determined, and the identification of H1N1 virus risk groups.
Driedger et al., 2015, Canada [72]	Peer-reviewed, primary research	Métis participants in urban, rural, and remote locations in Manitoba	Qualitative: focus groups	To link vaccination practice to the attitudes and beliefs that affected the H1N1 vaccine decision-making of Métis study participants.
Atter, 2021, Canada [73]	Gray literature	Lac La Ronge First Nation	News report	First Nations leaders say they do not want to lose any more community members to COVID-19. They are promoting the vaccine by going public with their vaccinations.
Goodyear, 2021, Canada [69]	Gray literature	Indigenous (First Nations, Inuit, and Métis) People	News report	To report on the new virtual sharing hub and Dr. Ojistoh Horn's efforts to help people in her community make informed vaccination decisions.
Trent University, 2022 [46]	Gray literature	Local Indigenous leaders of the Urban Indigenous Vaccine Working Group (UIVWG) and leadership at Peterborough Public Health (PPH)	News report	To report on the success of the UIVWG implementing vaccination clinics for Indigenous Peoples in the Peterborough/Nogojiwanong area.

Table 1 (continued)

Author, year, country	Publication type	Population	Study design	Objective
Women's College Hospital, 2021, Canada [47]	Gray literature	Indigenous (First Nations, Inuit, and Métis) communities	Newsletter	To report on a network of community partnerships supporting COVID-10 public health responses for urban Indigenous communities.
Anishinabek News, 2021, Canada [99]	Gray literature	First Nations, Inuit and Métis	News report	To share information about Maad'ookiing Mshkiki– Sharing Medicine hub.
O'Watch & Sullivan, 2021, Canada [60]	Gray literature	Indigenous youth	News report	To introduce a children's book which was co-created with the intention of reducing vaccine hesitancy.
Sidner et al., 2021, U.S. [77]	Gray literature	Indigenous population	News report	To raise awareness about COVID-19 vaccination.
Cruz & Velarde, 2022, U.S. [65]	Gray literature	Hispanic, Native American and Black/African/African American communities in New Mexico.	Report	To determine the barriers and concerns around the COVID-19 and influenza vaccinations, as well as methods for boosting vaccine confidence.
Clark et al., Australia, 2024 [48]	Peer-reviewed	Indigenous communities in Australia (Aboriginal and Torres Strait Islander Peoples) and Canada (First Nations, Inuit, and Métis).	Commentary	The study aims to showcase how Indigenous leadership and self-governance improved COVID-19 vaccination uptake in Indigenous communities, demonstrating the need for Indigenous autonomy in public health initiatives.
Collier et al., 2023, U.S. [49]	Peer-reviewed, primary research	Urban American Indian (AI) and Alaska Native (AN) parents and their children.	Quantitative: cross-sectional survey	To examine the parental characteristics, beliefs, and attitudes associated with COVID-19 vaccine acceptance for their children
Gonzalez & Stewart, 2024, U.S. [61]	Peer-reviewed, primary research	American Indian (AI) and Alaskan Native (AN) college students in Alaska	Quantitative: saturated path analysis using survey data	To investigate how historical trauma, racial discrimination, and healthcare system distrust contribute to vaccine hesitancy among AIAN college students
Marfo et al., 2024, Canada [62]	Peer-reviewed, primary research	Ethnically diverse parents in Canada with children aged 11–18.	Qualitative: semi-structured interviews and discourse analysis	To explore how intersecting social privileges and disadvantages shape access to and use of COVID-19 vaccine information and vaccination among diverse parents in Canada
Nascimento et al., 2023, Canada [50]	Peer-reviewed, primary research	Individuals from the general Canadian population, as well as specific equity-deserving groups, including First Nations, Métis, or Inuit, LGBT2SQ + individuals, low-income Canadians, Black Canadians, and newcomers.	Qualitative: semi-structured interviews and thematic analysis	To identify and document the contextual factors shaping vaccine hesitancy among equity-deserving groups in Canada.
Purvis et al., 2023, U.S. [63]	Peer-reviewed, primary research	Members of three tribal nations in the Great Plains.	Quantitative: cross-sectional survey	To assess factors associated with COVID-19 vaccination status among Indigenous populations in the Great Plains, considering social, cultural, and economic influences
Simms et al., 2023, Canada [51]	Peer-reviewed, primary research	Citizens of the Métis Nation of Ontario.	Qualitative: semi-structured interviews	To understand COVID-19 vaccine behavior among Métis people and the factors influencing vaccine uptake, including public discourse, interpersonal influences, and healthcare interactions

developing and implementing a comprehensive search strategy (see Additional file 1). Our search strategy was conducted across Embase, Web of Science, MEDLINE, PsycINFO, and PubMed. The initial database search covered from January 2000 up to August 2023. This was followed by citation searches conducted in Google search at the end of October 2023 to gather records, including gray literature that was not accessible through academic databases. A final round of database searches was performed at the end of January 2025, including studies published from October 2023 until the end of April 2024.

Study selection

All retrieved sources were imported to Covidence online software for screening [31]. After removing duplicates, the remaining sources proceeded to the study selection stage. The study selection consisted of two phases of screening. In the first phase, two reviewers screened the titles and abstracts of all retrieved sources and compared them against the eligibility criteria developed with the PCC framework. In the second phase, the remaining sources were read in full and assessed for eligibility by two reviewers. Any disagreements that arose were resolved through discussion and consensus.

Charting data

To facilitate the charting process, a data extraction tool (see Additional file 2) was developed in consultation with the research team members. The extraction tool was piloted by three reviewers (RM, LB, MAM) on each type of evidence source. The lead author extracted data from all the sources included for review. The sources were then randomly assigned to the remaining team members. The completed extraction forms were merged into a single Microsoft Word file. The extracted data were then charted to an evidence source characteristics table with conceptual categories derived from the extraction tool following the PCC framework and research questions (Table 1).

Collating, summarizing, and reporting results

Two independent reviewers conducted qualitative content analysis for each resource following recent JBI guidelines [32]. The data were analyzed in full by the lead author, who read all sources, and then verified independently by two authors. The steps for qualitative content analysis for this scoping review included preparation, organization, synthesis, and reporting [32].

Preparation involved becoming familiar with the full texts, merged extraction forms, and charted data. Initial open codes were inductively generated and grouped into meaningful categories that aligned with the research question. To organize the results, the categories were ranked in a numerical summary according to the facilitators, challenges, and benefits of narrative-based approaches to promote vaccine confidence. The results were synthesized by integrating the result categories that emerged from the data in a narrative summary. Three research team members met to discuss the coding framework, and two authors independently verified the congruency of the results. Reporting was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) extension for scoping reviews, known as the PRISMA-ScR [33].

Expert consultation

The sixth step of the scoping review process involved Indigenous expert consultation, aligning with a two-eyed seeing approach. We collaborated with representatives from the Debajehmujig Storytellers, an Anishnaabe (Indigenous) theatre group based on Manitoulin Island in Ontario, Canada. As the Indigenous community partners in our broader Indigenous vaccine confidence research, Debajehmujig Storytellers were ideal consultants for this review. They provided deep cultural insights and extensive experience in arts-based engagement with Indigenous communities, with a proven track record of using theatre, visual arts, and multimedia to explore various social, cultural, and health topics [34–36].

Throughout the review process, we held monthly meetings with two representatives from the Debajehmujig Storytellers. The collaboration culminated in an informal presentation and open discussion period in May 2024, following data analysis and prior to publication. The goal of this session was to incorporate culturally-based feedback and ensure the appropriate dissemination of research findings. This step was vital for aligning our work with the principles of two-eyed seeing, which integrates Indigenous and Western ways of knowing, to support a respectful and inclusive research process that equally values both Indigenous and Western perspectives.

Results

The PRISMA flow diagram outlines the selection process and depicts the excluded sources with justification (see Fig. 1). In total, 306 sources were captured from database searches ($n = 211$) and citation searches ($n = 95$). After removing duplicates, 217 sources were screened. During the title and abstract screening phase, 118 sources were deemed irrelevant. The remaining 99 sources were read in full and assessed for eligibility by two independent reviewers. At the end of the screening process, 45 publications (35 peer-reviewed, eight gray literature, and two preprint articles) were included.

Of the academic publications, 29 were primary research studies (17 qualitative, seven mixed-methods, and five quantitative). There were six peer-reviewed

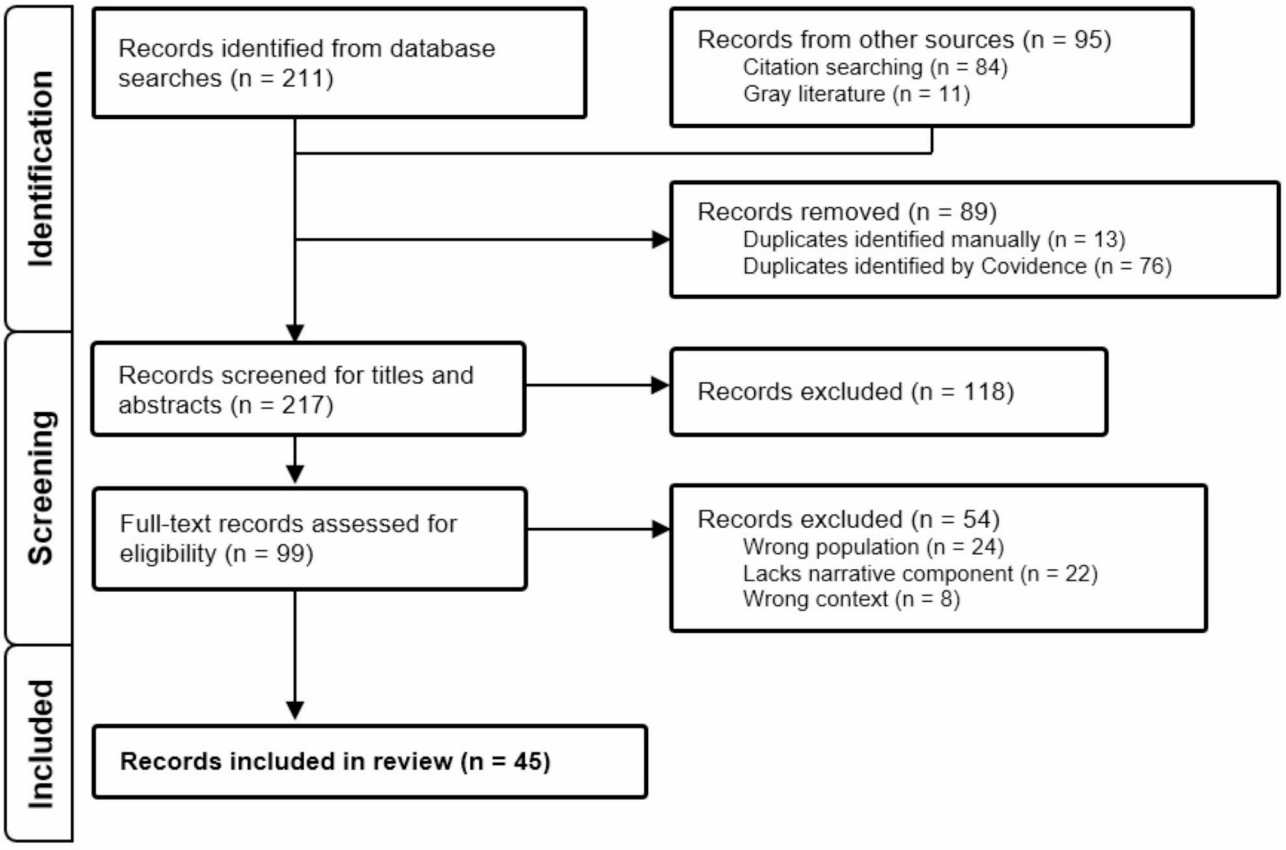

Fig. 1 PRISMA flow diagram

articles that did not constitute primary research (three commentaries, two reports, and one fact sheet). The majority of the sources were from the U.S. ($n = 19$) and Canada ($n = 17$), with additional sources from Australia ($n = 7$) and New Zealand ($n = 2$). The extracted data were categorized according to the facilitators, challenges, and benefits outlined in the research question. To visualize and present the resulting categories, word clouds were generated using Word Art online software.

Characteristics of the result categories

In our analysis of the result categories, we identified key characteristics of narrative-based approaches that (a) facilitated and (b) challenged public health initiatives aimed at promoting vaccine confidence in Indigenous communities, as well as (c) the community benefits that can be realized through implementing successful narrative-based interventions. Table 2 depicts the charted results (see Additional file 3).

Facilitators for successful narrative-based public health interventions

Facilitators refer to the factors or conditions that actively contribute to successful narrative-based public health interventions that promote vaccine confidence. For this scoping review, the facilitators prominently discussed in the literature included community engagement, tailored and culturally safe interventions, and trusted messengers and sources of information. Figure 2 shows the word cloud depicting the resulting categories for the facilitators.

Community engagement

Community engagement involves higher education institutions collaborating with broader communities (at the local, regional, national, and global levels) to share knowledge and resources in the spirit of partnership and reciprocity [37]. The goal is to integrate the expertise and resources of colleges and universities with those of the public and private sectors to improve academic scholarship, research, and creative endeavors; enrich curriculum and teaching methods; cultivate informed and active citizens; address pressing societal challenges; and advance the greater good. Broadly speaking, community engagement refers to the active involvement of community members in health programs, which helps them understand and address their specific needs and concerns [38].

Many studies have suggested that community engagement should be prioritized throughout the development and implementation of vaccine promotion strategies and

Fig. 2 Word cloud (facilitators)

interventions using transparent and respectful communication [11, 13, 15, 39–51]. Community members should be engaged in open dialogs so that service providers can learn about their concerns regarding vaccination [47, 52, 53]. This process often involves close collaboration with local Elders, traditional healers, and community leaders, who offer insight into values, preferences, and available resources. During the COVID-19 pandemic, successful vaccination interventions were influenced by many factors, such as data-driven and Indigenous-led efforts with messages that emphasized the protection of Elders, communities, and culture [54, 55].

There were several examples of community engagement in the crafting of effective messaging [39, 44, 56]. A quantitative experimental study assessed three culturally based messaging cues (weak, moderate and strong) concerning HPV vaccine confidence among Indigenous Peoples in the U.S [56]. The weak cultural messaging cue depicted a non-Indigenous youth playing soccer, the moderate cultural messaging cue depicted an Indigenous youth playing lacrosse, and the strong cultural messaging cue depicted an Indigenous youth wearing traditional regalia. Participants perceived that moderate and strong cultural messaging cues, which included an Indigenous youth, were significantly more convincing and pleasant than the weak cue. However, the authors noted no significant difference between the moderate and strong cues.

The authors of an Australian participatory action research study discussed a collaborative effort to codesign COVID-19 vaccine videos presented by First Nations leaders [44]. They noted that while health promotion campaigns in First Nations communities are frequently animated with anonymous voice-overs, video messaging should consider using real people instead of animations as animated characters cannot be held accountable. Furthermore, people who are deaf and hard of hearing cannot read the lips of animations [44].

During the COVID-19 pandemic, support from the Royal Flying Doctor Service of Australia (RFDS) was requested by 60 Indigenous community-controlled health organizations operating in rural and remote areas. A mixed-methods study reporting on this initiative showed that community engagement is essential for effective vaccine rollouts [39]. The authors identified a need to develop interventions in different languages to ensure trusted and respected information. A key challenge experienced in some communities involved the color of the providers' uniforms which had negative cultural and historical significance for the Indigenous Peoples: red was seen as disrespectful, and blue was seen as authoritarian as it reminded them of the police. In Australia, Indigenous Peoples have historically experienced a disproportionate number of deaths while in police custody [57]. To overcome this challenge, through community consultation, uniforms were redesigned to identify healthcare providers (HCP) in a culturally safe manner.

Tailored and culturally safe interventions

Indigenous cultures are diverse, with more than 630 distinct First Nations in Canada. These nations encompass a wide array of cultural beliefs and practices. While there is considerable diversity among Indigenous communities,

there are many shared values such as the importance of protecting others, promoting community well-being, and honoring cultural responsibilities [40, 55]. Indigenous worldviews are often holistic. They recognize the complete individual, including physical, emotional, mental, and spiritual aspects, as being deeply interconnected with the land and in reciprocal relationships with others [58].

To promote vaccine confidence with narrative-based approaches, there was strong agreement among the included sources that public health messages must be culturally safe and tailored to the unique contexts of individual communities. Tailored interventions reflective of community needs emerged as a prominent category in the literature included in this review [13, 39–41, 47, 48, 50, 51, 53, 55, 56, 59–63]. Having Indigenous identities represented in health promotion materials is essential for effective messaging [41, 44, 54–56, 64, 65]. Messages that focus on relational accountability and emphasize reciprocity, respect, and responsibility may also be effective [46, 47]. Relationality is not limited to community relationships, it can also include ancestors, lands, and more [66].

The authors of a mixed methods study that explored First Nations vaccine confidence in Canada emphasized the importance of listening to Indigenous perspectives to understand their beliefs and recommend avoiding one-size-fits-all solutions: "What works for one, may not for another, and what works at one time, may fail later.… [Perhaps] the only consistent 'best practice' is that, 'you really just have to listen to them, understand their… beliefs'"[52 p. 329]. U.S. studies that discussed risk perceptions on COVID-19 vaccinations reported that trusted and tailored strategies were required for effective messaging [54, 55]. Community-based interventions designed with relevant Indigenous identities are more effective than standardized interventions in delivering health messaging within Indigenous communities [11, 44, 47].

An example of such an approach was the children's book titled *Little Louis: A Culturally Relevant Vaccination Story*, developed in partnership with the Star Blanket Cree Nation, Morning Star Lodge (MSL), and MSL's partners [60]. This storytelling approach promoted vaccine confidence through culturally relevant narratives. In addition, a strong preference for accessing Indigenous health services and consulting Indigenous HCPs was reported [43, 47, 53–55, 64, 65, 67–69], further supporting the need for culturally safe and trusted health promotion efforts. Tailored and culturally safe narratives designed to respect and incorporate cultural values and practices render health messaging more acceptable and effective.

Trusted messengers and sources of information

Trusted messengers play an essential role in sharing persuasive and reliable health information and encouraging positive health behaviors. Trusted messengers and sources of information have emerged as key facilitators of narrative-based approaches to promote vaccine confidence among Indigenous Peoples [11, 15, 41, 42, 44, 48, 51, 54, 55, 59, 62–65, 67, 70–73]. Trust is often a deciding factor in whether people believe health advice, and when confronted with conflicting information, audiences rely on more trusted sources [74]. Trusted messengers may include Elders, traditional healers, local leaders, Indigenous healthcare professionals, and extended family members.

The important role of Indigenous women in promoting healthy behaviors was identified in two sources [65, 75]. Carter-Olson and colleagues argued that matriarchal structures were the foundation of many Indigenous societies in North America and that the voices of Indigenous women should be amplified as they can lead pandemic narratives [75]. Furthermore, in a listening session report from the University of New Mexico, Indigenous participants indicated that women, especially women in positions of authority, were seen as influential, particularly in making health-related decisions [65].

To strengthen vaccine confidence, Cruz and Velarde suggested that traditional healers share vaccine information when visiting people in the community [65]. Personal narratives and community-based testimonials have also been purportedly used to improve vaccine confidence in many studies [11, 52, 59, 65, 68, 69, 71, 73, 75–77]. A mixed-methods study conducted in Arizona strongly supported the use of community-based narratives from local leaders, elected officials, Elders, and other community members who had received the COVID-19 vaccine to encourage others in their community to do the same [39].

Studies from Australia and New Zealand have discussed the need to incorporate extended family members in vaccine decision-making. In Australia, the authors emphasized the importance of including family members in vaccine appointments to align with a culturally safe family-centered model [53]. Similarly, a child cohort study in New Zealand emphasized the essential role of whānau (extended family) for Māori parents when making health decisions and recommended incorporating vaccine conversations with mothers, fathers, and whānau into antenatal care to promote timely vaccine uptake [70].

Challenges for successful narrative-based public health interventions

This review aimed to employ a strength-based approach. However, focusing only on positive aspects of narratives can obscure realities and further entrench health

disparities [78]. Thus, a discussion of the challenges in implementing narrative-based approaches to improve vaccine confidence is necessary. The key categories relating to the challenges discussed in the literature included mistrust of government and healthcare systems, concerns about rapid vaccine development and potential side effects, fear of medical experimentation, and concerns about misinformation and discouraging information. See Fig. 3 for the word cloud depicting the resulting categories for the challenges reported for narrative approaches to promote vaccine confidence among Indigenous populations in colonized countries.

Mistrust of government and healthcare services

The mistrust of government and healthcare systems was discussed in the majority ($n = 30$) of the sources included for review [11–13, 39–42, 44, 47–51, 54, 55, 60–65, 67–71, 73, 77, 79, 80]. The lack of trust stemmed from several areas, including historical disease narratives related to colonialism (e.g., European settlers spreading smallpox to Indigenous populations) [11, 12, 55], concerns about rapid vaccine development and potential side effects [11, 42, 49, 61, 63, 64, 67, 71, 77, 79, 81], and a fear of medical experimentation, specifically the concern that Indigenous populations could be used as "guinea pigs" for testing vaccine safety [11, 12, 15, 45, 49, 50, 52, 54, 69, 71–73, 79, 81].

In Canada, the lack of trust in the government was exacerbated during the H1N1 pandemic in 2009, when government health authorities sent dozens of body bags to two First Nations communities in Manitoba instead of the requested funding for flu kits and personal protective equipment [82, 83]. In the U.S., a similar incident occurred during the COVID-19 pandemic in 2020, when an Indigenous health center in the Seattle region was sent body bags instead of the test kits they had requested [84]. These incidents were seen as callous and disrespectful pandemic response efforts. Additionally, systemic racism is still prevalent in the Canadian healthcare system as evidenced by the tragic and preventable deaths of Brian Sinclair [85] and Joyce Echaquan [86] and contributes to distrust in government to meet the healthcare needs of Indigenous Peoples.

Misinformation narratives

Misinformation or discouraging information is a significant challenge for vaccine confidence in all populations [39, 49, 51–53, 60–62, 64, 67, 70, 72–74, 76, 77]. A U.S. study that explored vaccine confidence among Indigenous Alaska residents highlighted how storytelling led by trusted community members may help address issues related to institutional distrust [71]. However, storytelling can also be an effective means of spreading misinformation [74]. People experience an attitude shift when they connect with characters and narratives may raise the possibility of attitude change. Both elements of storytelling can lower resistance to persuasive misinformation messaging [87].

Trust plays an important role in the reception of persuasive messages. When audiences are presented with contradictory stories, their level of trust in information sources can tip the balance in their decision-making [74].

Fig. 3 Word cloud (challenges)

Fig. 4 Word cloud (benefits)

Stories can exploit uncertainties, and in a rapidly changing COVID-19 pandemic with new variants and boosters, unaddressed underlying fears about vaccine side effects can be further manipulated by misinformation. Furthermore, oversimplifying or downplaying vaccine side effects can be problematic and can elicit counter-narrative approaches that promote vaccine hesitancy [12, 52].

"Truth-teller" rhetoric is a particularly effective misinformation strategy [74]. In the hopes that a populist hero will come to their rescue, audiences are easily drawn into dramatic stories, and they may relate to a sense of victimization [74]. Populist rhetoric is a type of political discourse that separates the populace into two groups: a corrupt and dysfunctional elite and a pure, virtuous, and victimized people [88]. Truth-teller rhetoric capitalizes on this narrative mechanism by positioning characters as resisting corrupt elites to benefit the victimized populace [74]. The teller promotes themselves as being truthful when they are in fact, knowingly or unknowingly, spreading misinformation.

Correcting misinformation can be challenging because repeating the misleading message in an attempt to debunk it could instead help to reinforce the message [74, 89, 90]. Misinformation campaigns have been shown to make effective use of storytelling when spreading anti-vaccine propaganda. To address misinformation narratives, implementing more effective storytelling, using some of the strategies outlined in the facilitator category above, could be beneficial. It can be difficult to counter misinformation with facts, but it is possible to counter a misinformation narrative with a better narrative [91]. However, more research is needed on this topic.

Benefits of narrative-based public health interventions for Indigenous health and wellness

The benefits refer to the positive outcomes or advantages that result from the successful implementation of public health interventions. This scoping review identified substantial benefits discussed in the literature. Community-based resources, which include local support systems and infrastructure, increase the reach and impact of health interventions. Culturally safe and relevant interventions ensure that health programs are respectful and considerate of cultural differences. Building trust and respectful relationships between health providers and the community fosters cooperation and support. Ultimately, these efforts contribute to improved vaccination rates, leading to better public health outcomes. Figure 4 shows a word cloud depicting the results.

Community-based resources

In Canada, a collaborative fact sheet developed with the National Collaborating Centre for Indigenous Health (NCCIH) highlighted several community-based, Indigenous-led, and culturally grounded vaccination initiatives [12]. The *Maad'ooking Mshkiki– Sharing Medicine* hub connects Indigenous communities with culturally relevant COVID-19 vaccine information and has created several posters and webinars about the viewpoints of

the First Nations, Inuit, and Métis people on COVID-19 vaccines and knowledge sharing [12, 92]. The Qikiqtani Inuit Association (QIA) has created many culturally relevant and Inuit-specific COVID-19 resources including infographics, posters, and videos in Inuktitut and English [12, 93]. A vaccine challenge was developed by MSL, an Indigenous community-based health research facility in Regina, Saskatchewan. Other COVID-19 resources developed by MSL included shareable posters, graphics, and details on COVID-19 vaccines.

Finally, *Protect Yourself. Protect our People* was a collaborative website developed by the Assembly of Manitoba Chiefs, Southern Chiefs' Organization, Manitoba Keewatinowi Okimakanak Inc., Manitoba Inuit Association, Keewatinohk Inniniw Minoayawin Inc., Manitoba Métis Federation, First Nations Health and Social Secretariat of Manitoba, & Southeast Research Development Council (SERDC). This website dispelled myths and presented facts regarding the COVID-19 vaccines. Additionally, it provided tools and information for scheduling appointments, accessing social media, and providing a platform for sharing vaccination experiences [94]. The website was evidence-based and culturally grounded to help First Nations people feel comfortable accessing reliable vaccine information.

Community-based and Indigenous-led vaccination initiatives offer several benefits by incorporating culturally relevant resources and storytelling. These vaccine initiatives are tailored for specific cultural contexts to address community concerns, making evidence-based data more accessible and engaging while fostering trust and relatability. Additionally, these platforms leverage community voices and experiences to promote vaccine confidence.

Culturally safe and relevant interventions

Studies have suggested a link between cultural safety and high vaccination rates [40, 55]. As shown in the children's book, *Little Louis*, community-based narrative approaches can prevent harmful misrepresentations of Indigenous Peoples, promote self-determination, and contribute to relevant solutions [60]. Providing culturally safe and informative messages that help people make informed decisions rather than coercing them respects their sovereignty [12, 44, 69]. Top-down authoritative messaging should be avoided when possible [71]. Collaborative efforts to design and distribute videos strengthened partnerships and increased the message's reach [44, 59]. Positive interactions and behaviors are encouraged when a holistic worldview is respected and an environment of trust, empathy, credibility, and compassion is established [41].

An Australian study employed a narrative approach called "yarning" to study the tailoring of immunization programs. Yarning circles and storytelling can help people make individual or group decisions [53]. They found that linking health messaging to tradition, culture, and community well-being was effective for disseminating information to people who potentially have lower levels of health literacy. Furthermore, Indigenous Peoples are more likely to feel comfortable using culturally safe services [67].

In a qualitative study in New Zealand, the authors discussed the benefits of a culturally safe environment where patients felt comfortable asking questions from their HCP. "'I honestly think it comes down to being proactive as well. Because like I can sit here and be like I'm pretty well informed but as I said I like to ask questions as well. So, like you won't know unless you ask questions…' (W13)" [64 p. 356]. Early presentation to the midwife, more Māori HCPs and culturally competent HCPs would all help build positive relationships and trust. This can lead to opportunities for conversations and encourage vaccine uptake.

Culturally safe narrative approaches are beneficial for promoting vaccine confidence. Collaborative efforts to design and distribute culturally safe and relevant resources strengthen partnerships and expand the reach of health messages. Creating a culturally safe environment where patients feel comfortable asking questions fosters trust, builds positive relationships, and encourages vaccine uptake.

Building trust and respectful relationships

Embracing culture and acknowledging historical and contemporary factors, such as the lasting impact of colonization, are essential for building trust [11, 40, 47, 48, 50, 51, 55, 62, 63, 68, 71]. In regard to building trust, the vital role of Elders cannot be overstated. According to Cherokee scholar Michael Garret, Native Elders are the keepers of traditional and sacred knowledge: "They are protectors, mentors, teachers, and support-givers. Native communities honour their elders as the 'Keepers of the Wisdom,' recognizing their lifetime's worth of knowledge and experience" [95 p. 474].

To encourage vaccine uptake, the effective integration of traditional Indigenous knowledge and Western biomedicine requires extensive communication and consultation with Indigenous knowledge keepers. The review results highlighted the benefits of involving Elders in health initiatives to encourage respectful collaboration and build trust. This approach honors the cultural values and experiences of Indigenous Peoples and ensures that health messages are more relatable and credible.

Improved vaccination rates

A U.S. report highlighted the success of vaccination efforts among Indigenous communities [15]. There were consistently higher vaccination rates among American

Indians and Alaskan Natives (AI/AN) than among the general population since COVID-19 vaccinations became available. The author cited sharing as a cultural strength that led to higher vaccination rates by sharing vaccine doses. Once the Indigenous community members were vaccinated, they began sharing vaccine doses with non-Indigenous Peoples who interacted with the community. Vaccinating non-Indigenous Peoples who interact with and live among Indigenous Peoples can make everyone feel safer [15, 77]. The success of vaccination campaigns in AI/AN villages was credited to supporting local leaders in setting their own priorities for vaccination distribution while incorporating cultural values and trusted community members in the advocacy process with sufficient government supplies [15].

The topic of community-led interventions leading to higher vaccination rates has been echoed in several sources [40, 43, 48, 61, 63, 67, 70, 81]. An Australian study cited a preference for accessing testing and vaccination at an Aboriginal Health Service (AHS) or a trusted local general practitioner [67]. They called for developing and implementing health programs that reduce racism experienced by Aboriginal people. Similarly, a Canadian case study report on Canada's first Métis-led vaccination clinic in Alberta cited the culturally safe and community-led clinic as a primary reason for their success [43].

In a U.S. study, it was suggested that a COVID-19 immunization campaign in AI/AN villages was effective because it was developed from the ground up with a strong sense of community and a reverence for tribal sovereignty [40]. In a New Zealand study the authors discussed how open dialog and one-on-one conversations about vaccination were associated with improved diphtheria, tetanus, pertussis, hepatitis B, polio, and *Haemophilus influenzae* type b (DTaP-HB-IPV-Hib) and pneumococcal conjugate vaccine uptake [70]. It was noted that creating an environment where people felt safe asking questions was correlated with improved health literacy, resulting in improved vaccination rates.

Discussion

This scoping review aimed to assess the breadth of evidence concerning the role of narratives in promoting vaccine confidence among Indigenous Peoples within Anglosphere nations sharing similar colonial histories. To provide practical insights for HCPs and policymakers, the data were organized into key concepts: facilitators for developing and implementing successful programs, challenges to address and overcome, and benefits that can be realized through effective narrative-based interventions. Across these three conceptual categories, the literature highlighted the integral role of trust regarding narrative-based efforts to promote vaccine confidence.

Narrative-based strategies are a relatively novel area within health promotion that has yet to be comprehensively explored. Scoping reviews offer the advantage of allowing for the inclusion of gray literature and do not require a rigorous quality assessment of sources. The inclusion of gray literature proved valuable in capturing rich data on narrative-based health promotion efforts within Indigenous communities that might otherwise not have been accessible through academic database searches.

The two-eyed Seeing framework, developed by Mi'kmaq Elders Albert and Murdena Marshall, guided this review process. Two-eyed seeing promotes equitable power relationships between Indigenous and Western knowledge systems; this is a decolonized approach to research that involves ongoing self-reflection, openness to new perspectives, and readiness for adjustment [28]. Two-eyed seeing also encourages a shift in the epistemological perspective. "Knowledge is not a tool, but rather it is a spirit. It transforms the holder. It also reminds us that we have responsibilities to the spirit of that knowledge. We must pass it on" [96 p. 19]. By acknowledging diverse perspectives and learning to see with the strengths of both Indigenous and Western ways of knowing, the analysis was enriched to ensure a more holistic understanding of the evidence.

In the spirit of collaboration and community-based participatory research, monthly meetings were held with representatives from NOSM U, Debajehmujig Storytellers, and Public Health Sudbury and Districts. The final consultation with Debajehmujig constituted a community-specific evaluation of the scoping review. During the open discussion period, some concerns were raised about the need to clarify terminology, avoid overuse of academic language, ensure an orderly and sincere presentation of data, and avoid assigning undue value to results based solely on frequency when reporting the information back to Indigenous communities to inform their public health programs.

The Indigenous advisors told us that the results should tell a story that is concise and coherent. It is important to tailor messages to relevant audiences. The overuse of esoteric academic language can be off-putting and unnecessary. Additionally, there is a risk of disregarding perspectives simply because they are less prevalent in the literature. For example, in the word cloud for facilitators of narrative-based approaches, the *plain language* category appeared smaller than others because it was found in only two of the sources reviewed. However, the Indigenous advisors felt that the use of plain language is highly significant given their experience and is thus underrepresented in the literature. It is important to be open and transparent that ranking results by prevalence may not necessarily assign inherent significance to the

information. It is a reflection of the landscape of the literature and not an endorsement of worth.

Gaps

A notable gap in the literature pertained to the lack of Indigenous-specific vaccine research. The exclusion of numerous sources was due to the absence of disaggregated Indigenous participant data. This made it difficult to distinguish between discussions about Indigenous and non-Indigenous populations. The issue with BIPOC studies is that they combine the unique historical and cultural perspectives of Indigenous Peoples with those of non-white settlers of Indigenous lands. Many Indigenous communities and individuals have voiced a desire to have data disaggregated by ethnicity and specific Indigenous groups (e.g., First Nations, Inuit, and Métis) to better reflect their needs [12, 42, 51, 97].

Future considerations

In understanding the significance of narratives and the data gathered it becomes clear that open communication, empathy, and respect are key drivers of trust and narrative-based health promotion efforts [11, 42, 52]. To be effective, public health promotion campaigns should be characterized by humility. Creating a safe environment for asking questions can improve feelings of safety and, in turn, enhance health literacy and improve vaccination rates [70]. Furthermore, focusing on empathy and understanding creates a space that invites Indigenous people to share their needs, wants, and experiences with one another and acts as an emotional bridge to encourage further respectful behavior [98].

Health messaging within Indigenous communities should be timely, consistent, and culturally grounded [40]. It is imperative to avoid oversimplifying or downplaying vaccine side-effects and making definitive statements that "vaccines are safe" [12, 52]. Statements such as "the COVID-19 vaccines appear safe" or "research is showing the COVID-19 vaccines are safe" were considered more acceptable [52].

Effective health promotion strategies to strengthen vaccine confidence require the involvement of trusted messengers to relay information. Vaccination campaigns within Indigenous communities should be led or co-led by respected people such as Elders, local leaders, and extended family members [44, 55]. As protectors, teachers, and knowledge keepers, Indigenous Elders play a pivotal role in instilling confidence in vaccines. Listening to Elders is a key facilitator for promoting vaccine confidence [11, 15]. Additionally, the involvement of extended family members, such as aunts, uncles, and grandparents, is important when sharing health information. Including them in appointments and discussions about vaccines aligns with a family-centered health model [64].

To promote vaccine confidence among Indigenous Peoples, it is imperative to respect Indigenous sovereignty and self-determination. This involves co-creating tailored health promotion programmes to specific communities and ensuring cultural relevance; community leaders should be actively engaged throughout the process to facilitate collaboration and build trust [11, 39, 61, 68]. Acknowledging and understanding the unique contexts of colonization is essential for co-creating tailored interventions [13, 50, 54, 65, 70, 99].

Widespread mistrust of government and non-Indigenous health services suggests that top-down authoritative messaging must be avoided. Instead, interventions should favor collaborative and community-led approaches with culturally safe messaging. Given the preference for accessing testing and treatment from Indigenous HCPs and at Indigenous health services, an important step toward repairing trust is increasing the number of Indigenous HCPs. In the literature reviewed, Indigenous HCPs were often considered trusted messengers and sources of information. The need for more Indigenous HCPs in Canada is encapsulated in the Truth and Reconciliation Commission's Call to Action #23. The call to action #23 encompasses three key points: (1) increasing the number of Indigenous healthcare professionals, (2) ensuring the retention of Indigenous healthcare professionals working within Indigenous communities, and (3) providing cultural competency training for all healthcare professionals [100].

Considering the diversity of Indigenous cultures, beliefs, and practices, universal approaches to promote vaccine confidence may not be effective. Therefore, one-size-fits-all and top-down authoritative approaches should be avoided [71]. Authoritative health promotion approaches, such as vaccine mandates, undermine personal autonomy and the right to self-determination [12]. Some viewed mandates as assimilative in that they reward people who suspend their beliefs with full participation in society and punish those who refuse to doubt the Creator and vaccinate [52]. To ensure effective health promotion, it is essential to prioritize culturally sensitive messaging that respects the autonomy and diversity of Indigenous communities.

Trust is a decisive factor in whether individuals will embrace health advice, regardless of the accuracy of the information conveyed. When confronted with conflicting information, audiences often rely on more trusted sources [74]. Misinformation can be particularly difficult to dispel because repeating false information can reinforce rather than debunk the message. However, it is possible to overcome persuasive narrative misinformation with more effective narrative messaging [91].

Trust and empathy can improve when messages are culturally focused and developed by messengers [41].

Culturally safe and informative messaging that supports people in making informed decisions rather than coercing them respects their sovereignty [44, 69]. Through technologies such as paper, painting, sculpture, cinema, photography, etc., Indigenous worldviews are represented, colonial narratives are resisted, and people are educated about the lived realities of Indigenous Peoples [101]. This representation helps people identify and bond with characters — a salient facilitator of narrative-based approaches to promote health behavior.

Strengths and limitations

A key strength of this review lies in its adherence to the JBI scoping review guidelines, with multiple independent reviewers participating in screening, extraction, and analysis. This study was conducted by a multidisciplinary team of experienced and novice researchers with different backgrounds who contributed diverse perspectives. Additionally, incorporating gray literature yielded valuable insights into storytelling and Indigenous vaccine confidence. However, two notable limitations should be acknowledged. Due to the holistic nature of the topic, disentangling the facilitators and benefits of narrative-based approaches proved challenging, given that there is the potential for overlap. Furthermore, the results captured a mixture of narrative-based facilitators and facilitators of general vaccine confidence.

Conclusion

This scoping review demonstrated the significant role of narrative-based approaches in promoting vaccine confidence among Indigenous populations. By using culturally relevant and community-focused messaging, these strategies can help address historical mistrust and systemic challenges that have negatively affected vaccine confidence. This review emphasized the importance of health promotion efforts that respect Indigenous sovereignty and self-determination.

To develop and implement culturally safe interventions, it is necessary to consult with Indigenous communities and incorporate Indigenous perspectives. Collaborative interventions that engage trusted community members and use storytelling have been shown to build trust, encourage informed decision-making, and improve vaccination rates. Future public health initiatives should prioritize these inclusive and respectful methods to support the health and well-being of Indigenous communities.

Abbreviations

AHS	Aboriginal Health Service
AI/AN	American Indian and Alaskan Native
BIPOC	Black, Indigenous, and People of Color
DTaP-IPV-Hib	Diphtheria, tetanus, pertussis, polio, and Haemophilus influenzae type b
DTaP-HB-IPV-Hib	Diphtheria, tetanus, pertussis, hepatitis B, polio, and Haemophilus influenzae type b
HCP	Healthcare provider
HPV	Human papillomavirus
JBI	Joanna Briggs Institute
MMR	Measles, Mumps, & Rubella
MSL	Morning Star Lodge
NCCIH	National Collaborating Centre for Indigenous Health
NOSM U	Northern Ontario School of Medicine University
PCC	Population, Concept, Context
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
SERDC	Southeast Research Development Council
QIA	Qikiqtani Inuit Association
U.S.	United States
WHO	World Health Organization

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12939-025-02424-3.

Supplementary Material 1

Supplementary Material 2

Supplementary Material 3

Acknowledgements

This scoping review is aligned with a larger collaborative community-based participatory research study involving academics and an Indigenous theatre group. The goal of this study was to cocreate approaches to strengthen vaccine confidence in Indigenous youth and young adults. We extend our heartfelt thanks to the study team for their ongoing support and advice on this scoping review. In particular, we wish to thank Dr. Alison Humphrey from York University, Joahnna Berti and Bruce Naokwegijig from Debajehmujig Storytellers, and Mariette Sutherland. We would also like to thank the Canadian Institutes of Health Research for funding this study (operating grant number VC1-178871).

Author contributions

RM: Conducted a preliminary literature search, screened abstracts and full text sources, extracted and analyzed data, and drafted the manuscript. MR: Screened abstracts and full text sources, extracted data, and contributed to manuscript preparation. LB: Screened abstracts and full text sources, extracted data, analyzed sources to ensure result congruency and contributed to manuscript preparation. DPK: Screened abstracts and full text sources and extracted data. SK: Screened abstracts and full text sources and extracted data.MM: Co-developed a comprehensive search strategy, executed database searches. and contributed to manuscript preparation. MAM: Screened abstracts and full text sources, extracted data, ensured result congruency and contributed to manuscript preparation.

Funding

Funding was provided by the Canadian Institutes of Health Research, Operating Grant #VC1-178871.

Data availability

Data is provided within the manuscript or supplementary information files.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details
[1]School of Kinesiology and Health Sciences, Laurentian University, 935 Ramsey Lake Rd., Sudbury, ON P3E 2C6, Canada
[2]Clinical Sciences Division, Northern Ontario School of Medicine (NOSM) University, 935 Ramsey Lake Rd., Sudbury, ON P3E 2C6, Canada
[3]Human Sciences Division, Northern Ontario School of Medicine (NOSM) University, 935 Ramsey Lake Rd., Sudbury, ON P3E 2C6, Canada
[4]Postgraduate Medical Education, Northern Ontario School of Medicine (NOSM) University, 955 Oliver Rd., Thunder Bay, ON P7B 5E1, Canada
[5]Health Sciences Library, Northern Ontario School of Medicine (NOSM) University, 935 Ramsey Lake Rd., Sudbury, ON P3E 2C6, Canada

Received: 27 June 2024 / Accepted: 22 February 2025
Published online: 05 March 2025

References

1. White F, Stallones L, Last J. Global Public Health - Ecological Foundations. 2013.
2. Riedel S. Edward Jenner and the history of smallpox and vaccination. Proc (Bayl Univ Med Cent). 2005;18(1):21–5.
3. Dubé E, Vivion M, MacDonald NE. Vaccine hesitancy, vaccine refusal and the anti-vaccine movement: influence, impact and implications. Expert Rev Vaccines. 2015;14(1):99–117.
4. MacDonald NE, SAGE Working Group on Vaccine Hesitancy. Vaccine hesitancy: definition, scope and determinants. Vaccine. 2015;33(34):4161–4.
5. Government of Canada. Addressing vaccine hesitancy in the context of COVID-19: A primer for health care providers. 2021. https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/health-professionals/vaccines/vaccine-hesitancy-primer.html. Accessed 18 Feb 2024.
6. Wodarg W. A timeline of the Wakefield Retraction. Nat Med. 2010;16(3):248–248.
7. Wong LP, Wong PF, AbuBakar S. Vaccine hesitancy and the resurgence of vaccine preventable diseases: the way forward for Malaysia, a Southeast Asian country. Hum Vaccines Immunotherapeutics. 2020;16(7):1511–20.
8. Feldman AG, O'Leary ST, Danziger-Isakov L. The risk of resurgence in Vaccine-Preventable infections due to coronavirus disease 2019-Related gaps in immunization. Clin Infect Dis. 2021;73(10):1920–3.
9. World Health Organization. Behavioural considerations for acceptance and uptake of COVID-19 vaccines: WHO technical advisory group on behavioural insights and sciences for health, meeting report, 15 October 2020. 2020. https://apps.who.int/iris/handle/10665/337335. Accessed 3 Sept 2023.
10. World Health Organization. Ten health issues WHO will tackle this year. 2019. https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019. Accessed 18 Feb 2024.
11. Ignacio M, Oesterle S, Mercado M, Carver A, Lopez G, Wolfersteig W et al. Narratives from African American/Black, American Indian/Alaska Native, and Hispanic/Latinx community members in Arizona to enhance COVID-19 vaccine and vaccination uptake. J Behav Med. 2023;46(1–2):140–52.
12. Funnell DS, Hayes DT, Stout R. Promoting vaccine confidence amongst First Nations, Inuit and Métis peoples during the time of COVID-19. National Collaborating Centre for Indigenous Health. 2022. https://www.nccih.ca/Publications/lists/Publications/PVC/Promoting-Vaccine-Confidence-FS-EN_Web_2021-10-28.pdf. Accessed 14 July 2023.
13. Mosby I, Swidrovich J. Medical experimentation and the roots of COVID-19 vaccine hesitancy among Indigenous peoples in Canada. CMAJ. 2021;193(11):E381–3.
14. Tasker JP. Vaccination rate is 6 times higher in Indigenous communities than in general population. CBC News. 2021. https://www.cbc.ca/news/politics/indigenous-vaccination-rates-1.5917161. Accessed 27 Feb 2024.
15. Silberner J. Covid-19: how native Americans led the way in the US vaccination effort. BMJ. 2021;374:n2168.
16. Smylie J, McConkey S, Rachlis B, Avery L, Mecredy G, Brar R, et al. Uncovering SARS-COV-2 vaccine uptake and COVID-19 impacts among first nations, Inuit and Métis peoples living in Toronto and London, Ontario. CMAJ. 2022;194(29):E1018–26.
17. First Nations Health Authority (FNHA). COVID-19 Vaccination Numbers Add Up to a Concern for First Nations Population. 2021. https://www.fnha.ca:443/about/news-and-events/news/covid-19-vaccination-numbers-add-up-to-a-concern-for-first-nations-population. Accessed 18 Feb 2024.
18. MacDonald SE, Graham B, King KD, Huang L, Svenson LW, Nelson G. Improved vaccine coverage for first nations children receiving first dose on-reserve: a retrospective cohort study in Western Canada. BMJ Glob Health. 2023;8(12):e013261.
19. Baker M, Turner N, David M, Kvalsvig A, Mansoor O, Wilson N. Urgent action needed to prevent a measles epidemic in Aotearoa New Zealand. Public Health Expert Briefing. 2024. https://www.phcc.org.nz/briefing/urgent-action-needed-prevent-measles-epidemic-aotearoa-new-zealand. Accessed 12 June 2024.
20. Green MC, Clark JL. Transportation into narrative worlds: implications for entertainment media influences on tobacco use: narrative transportation and tobacco use. Addiction. 2013;108(3):477–84.
21. Brockington G, Gomes Moreira AP, Buso MS, Gomes da Silva S, Altszyler E, Fischer R, et al. Storytelling increases Oxytocin and positive emotions and decreases cortisol and pain in hospitalized children. Proc Natl Acad Sci. 2021;118(22):e2018409118.
22. Murphy ST, Frank LB, Moran MB, Patnoe-Woodley P, Involved. Transported, or emotional?? Exploring the determinants of change in knowledge, attitudes, and behavior in Entertainment-Education. J Communication. 2011;61(3):407–31.
23. Manaseri H, Roberts KD, Stofocik K, Manuel N, Uehara DL. Culture as a protective factor: the use of storytelling in a teen pregnancy and STI prevention curriculum. Health Care Curr Reviews. 2014;2(3):127.
24. Iseke J. Indigenous storytelling as research. Int Rev Qualitative Res. 2013;6(4):559–77.
25. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. Int J Soc Res Methodol. 2005;8(1):19–32.
26. Levac D, Colquhoun H, O'Brien KK. Scoping studies: advancing the methodology. Implement Sci. 2010;5(1):69.
27. Peters MDJ, Marnie C, Tricco AC, Pollock D, Munn Z, Alexander L, et al. Updated methodological guidance for the conduct of scoping reviews. JBI Evid Synthesis. 2020;18(10):2119.
28. Martin DH, Two-Eyed Seeing. A framework for Understanding Indigenous and Non-Indigenous approaches to Indigenous health research. Can J Nurs Res Archive. 2012;44(2):20–43.
29. Peters MDJ, Godfrey CM, Khalil H, McInerney P, Parker D, Soares CB. Guidance for conducting systematic scoping reviews. Int J Evid Based Healthc. 2015;13(3):141–6.
30. Campbell SM, Dorgan M, Tjosvold L. Filter to retrieve studies related to indigenous people of Canada the ovid medline database. John W. Scott Health Sciences Library, University of Alberta. 2022. https://docs.google.com/document/d/1XqpWHN7hrFIyNwaqucRFRXaCnBOaeshFw4SR31Uxyek/edit
31. Grenier M, LibGuides. Covidence: Overview of Covidence. University of Victoria. 2022. https://libguides.uvic.ca/c.php?g=717748&p=5123584. Accessed 18 Feb 2024.
32. Pollock D, Peters MDJ, Khalil H, McInerney P, Alexander L, Tricco AC, et al. Recommendations for the extraction, analysis, and presentation of results in scoping reviews. JBI Evid Synthesis. 2023;21(3):520.
33. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. Ann Intern Med. 2018;169(7):467–73.
34. Bessette N, Reade M, McGregor L, Berti J, Naokwegijig B, Maar M. Culturally safe practices in the Co-creation of medical education curriculum with Indigenous animators: outcomes from an Indigenous learning circle. J Med Educ Curric Dev. doi: 2023;10:23821205231219430.
35. Maar M, McGregor L, Desjardins D, Delaney KZ, Bessette N, Reade M. Teaching culturally safe care in simulated cultural communication scenarios during the COVID-19 pandemic: virtual visits with Indigenous animators. J Med Educ Curric Dev. doi: 2022;9:23821205221091034.
36. Maar M, Bessette N, McGregor L, Lovelace A, Reade M. Co-creating simulated cultural communication scenarios with Indigenous animators: an evaluation of innovative clinical cultural safety curriculum. J Med Educ Curric Dev. doi: 2020;7:2382120520980488.
37. American Council on Education. The Elective Classification for Community Engagement. 2024. https://carnegieclassifications.acenet.edu/elective-classifications/community-engagement/. Accessed 28 May 2024.
38. Durrance-Bagale A, Marzouk M, Tung LS, Agarwal S, Aribou ZM, Ibrahim NBM, et al. Community engagement in health systems interventions and research in conflict-affected countries: a scoping review of approaches. Glob Health Action. 2022;15(1):2074131.
39. Gardiner FW, Schofield Z, Hendry M, Jones K, Smallacombe M, Steere M, et al. A novel COVID-19 program, delivering vaccines throughout rural and remote

Australia. Front Public Health. 2023. https://doi.org/10.3389/fpubh.2023.1019536.
40. Haroz EE, Kemp CG, O'Keefe VM, Pocock K, Wilson DR, Christensen L, et al. Nurturing innovation at the roots: the success of COVID-19 vaccination in American Indian and Alaska native communities. Am J Public Health. 2022;112(3):383–7.
41. Tutt M, Begay C, George S, Dickerson C, Kahn C, Bauer M, et al. Diné teachings and public health students informing peers and relatives about vaccine education: providing diné (Navajo)-centered COVID-19 education materials using student health messengers. Front Public Health. 2022. https://doi.org/10.3389/fpubh.2022.1046634.
42. Carson SL, Casillas A, Castellon-Lopez Y, Mansfield LN, Morris D, Barron J, et al. COVID-19 vaccine Decision-making factors in Racial and ethnic minority communities in Los Angeles, California. JAMA Netw Open. 2021;4(9):e2127582.
43. King KD, Bartel R, James A, MacDonald SE. Practice report: an Alberta Métis model for COVID-19 vaccine delivery. Can J Public Health. 2022;113(1):81–6.
44. Kerrigan V, Park D, Ross C, Herdman RM, Wilson PM, Gunabarra C, et al. Countering the wrong story: a participatory action research approach to developing COVID-19 vaccine information videos with first nations leaders in Australia. Humanit Soc Sci Commun. 2023;10(1):1–12.
45. Driedger SM, Cooper E, Jardine C, Furgal C, Bartlett J. Communicating risk to aboriginal peoples: first nations and Metis responses to H1N1 risk messages. PLoS ONE. 2013;8(8):e71106.
46. Trent University. Sharing the Stories of Indigenous-Led COVID Vaccine Clinics. Trent University News. 2022. https://www.trentu.ca/news/story/33809. Accessed 18 Feb 2024.
47. Women's College Hospital. Knowledge, Love & Storytelling is Medicine. 2021. https://wchcovidreport.womenscollegehospital.ca/knowledge-is-medicine-love-is-medicine-storytelling-is-medicine/. Accessed 18 Feb 2024.
48. Clark K, Crooks K, Jeyanathan B, Ahmed F, Kataquapit G, Sutherland C, et al. Highlighting models of Indigenous leadership and Self-Governance for COVID-19 vaccination programmes. AlterNative: Int J Indigenous Peoples. 2024;20(1):250–58.
49. Collier AF, Schaefer KR, Uddin A, Noonan C, Dillard DA, Son-Stone L, et al. COVID-19 vaccination in urban American Indian and Alaska native children: parental characteristics, beliefs and attitudes associated with vaccine acceptance. Vaccine: X. 2023. https://doi.org/10.1016/j.jvacx.2023.100406.
50. Nascimento LG, Dube E, Burns KE, Brown P, Calnan M, Ward PR, et al. Informing efforts beyond tailored promotional campaigns by Understanding contextual factors shaping vaccine hesitancy among Equity-Deserving populations in Canada: an exploratory qualitative study. Int J Equity Health. 2023. https://doi.org/10.1186/s12939-023-02025-y.
51. Simms AJ, King KD, Tsui N, Edwards SA, Métis N, Ontario, Mecredy G. COVID-19 vaccine behaviour among citizens of the Metis Nation of Ontario: A qualitative study. Vaccine. 2023;41(38):5640–7.
52. Sullivan P, Starr V, Dubois E, Starr A, Acharibasam JB, McIlduff C. Where past Meets present: Indigenous vaccine hesitancy in Saskatchewan. Med Humanit. 2023. https://doi.org/10.1136/medhum-2022-012501.
53. Thomas S, Paden V, Lloyd C, Tudball J, Corben P. Tailoring immunisation programs in Lismore, new South Wales - we want our children to be healthy and grow well, and immunisation really helps. Rural Remote Health. 2022;22(1):6803.
54. Boyd AD, Buchwald D. Factors that influence risk perceptions and successful COVID-19 vaccination communication campaigns with American Indians. Sci Communication. 2022;44(1):130–9.
55. Ellenwood R, Boyd AD, Higheagle Strong Z. Communication and perspectives about COVID-19 and vaccinations among native Americans. Sci Communication. 2023;107554702211511.
56. Yzer M, Rhodes K, McCann M, Harjo J, Nagler RH, LoRusso SM, et al. Effects of cultural cues on perceptions of HPV vaccination messages among parents and guardians of American Indian youth. Prev Med. 2018;115:104–9.
57. Australian Human Rights Commission. Indigenous Deaths in Custody. 1996. https://humanrights.gov.au/our-work/aboriginal-and-torres-strait-islander-social-justice/publications/indigenous-deaths. Accessed 18 Feb 2024.
58. Cull I, Hancock RLA, McKeown S, Pidgeon M, Vedan A. Indigenous Ways of Knowing and Being. 2018. https://opentextbc.ca/indigenizationfrontlineworkers/chapter/indigenous-ways-of-knowing-and-being/. Accessed 11 June 2024.
59. Villar ME. Community engagement and co-creation of strategic health and environmental communication: collaborative storytelling and game-building. JCOM. 2021;20(01):C08.
60. O'Watch H, Sullivan P. Indigenous children's book 'Little Louis' aims to curb COVID-19 vaccine hesitancy with a culturally relevant story. The Conversation. 2021. http://theconversation.com/indigenous-childrens-book-little-louis-aims-to-curb-covid-19-vaccine-hesitancy-with-a-culturally-relevant-story-165229. Accessed 3 Sept 2023.
61. Gonzalez VM, Stewart TJ. COVID-19 vaccine hesitancy among American Indian and Alaska native college students: the roles of discrimination, historical trauma, and healthcare system distrust. J Behav Med. 2024;47(1):123–34.
62. Marfo EA, Manca T, Cha EA, Aylsworth L, Driedger SM, Meyer SB, et al. Intersecting inequities in COVID-19 vaccination: A discourse analysis of information use and Decision-Making among ethnically diverse parents in Canada. J Racial Ethnic Health Disparities. 2024. https://doi.org/10.1007/s40615-024-01940-2.
63. Purvis SJ, Armstrong K, Isaacson MJ, Soltoff A, Duran T, Johnson G, et al. Factors associated with COVID-19 vaccination uptake in great plains American Indian communities. J Racial Ethnic Health Disparities. 2024. https://doi.org/10.1007/s40615-023-01818-9.
64. Gauld N, Marion S (Ngā Puhi), Sinclair O (Te Rarawa), Dumble, Petousis-Harris F, Grant H. CC. Mapping the maternal vaccination journey and influencing factors for Māori women in Aotearoa New Zealand: a qualitative study. J Prim Health Care. 2022;14(4):352–62.
65. Cruz TH, Velarde C, REACH - COVID and Flu Vaccine Supplement Listening Sessions Report. 2022. https://digitalrepository.unm.edu/prc-reports-documents/47. Accessed 18 Feb 2024.
66. O'Keefe VM, Maudrie TL, Cole AB, Ullrich JS, Fish J, Hill KX, et al. Conceptualizing Indigenous strengths-based health and wellness research using group concept mapping. Archives Public Health. 2023;81(1):71.
67. Graham S, Blaxland M, Bolt R, Beadman M, Gardner K, Martin K, et al. Aboriginal peoples' perspectives about COVID-19 vaccines and motivations to seek vaccination: a qualitative study. BMJ Global Health. 2022;7(7):e008815.
68. Bowen DJ, Weiner D, Samos M, Canales MK. Exploration of new England native American women's views on human papillomavirus (HPV), testing, and vaccination. J Racial Ethnic Health Disparities. 2014;1(1):45–51.
69. Goodyear S. How one Indigenous doctor is tackling vaccine hesitancy, starting with her own mom. CBC News. 2021. https://www.cbc.ca/radio/asithappens/as-it-happens-monday-edition-1.5905624/how-one-indigenous-doctor-is-tackling-vaccine-hesitancy-starting-with-her-own-mom-1.5905641. Accessed 18 Feb 2024.
70. Gilchrist CA, Chelimo C, Tatnell R, Atatoa Carr P, Camargo CA Jr, Morton S, et al. Vaccination information fathers receive during pregnancy and determinants of infant vaccination timeliness. Hum Vaccines Immunotherapeutics. 2021;17(12):5214–25.
71. Eichelberger LP, Fried RL, Cochran P, Hahn M. In the beginning, I said I wouldn't get it.: In-depth qualitative interviews to understand vaccine hesitancy, acceptance, and Decision-Making in remote Alaska between November 2020 and July 2021. Res Square [preprint]. 2022. https://doi.org/10.21203/rs.3.rs-1436259/v1.
72. Driedger SM, Maier R, Furgal C, Jardine C. Factors influencing H1N1 vaccine behavior among Manitoba Metis in Canada: a qualitative study. BMC Public Health. 2015;15(1):128.
73. Atter H. First Nation leaders share vaccine experiences online to combat hesitation, misinformation. CBC News. 2021. https://www.cbc.ca/news/canada/saskatchewan/first-nation-leaders-share-vaccine-experiences-1.5876063. Accessed 18 Feb 2024.
74. McDowell K. Storytelling and/as Misinformation: Storytelling dynamics and narrative structures for three cases of COVID-19 viral misinformation. Cambridge Studies on Governing Knowledge Commons. 2024. https://hdl.handle.net/2142/117174. Accessed 18 Feb 2024.
75. Carter Olson CS, LaPoe B, LaPoe V, Azocar CL, Hazarika B. Mothers are medicine: U.S. Indigenous media emphasizing Indigenous women's roles in COVID-19 coverage. J Communication Inq. 2022;46(3):289–310.
76. Manca T, Humble RM, Aylsworth L, Cha E, Wilson SE, Meyer SB, et al. We need to protect each other: COVID-19 vaccination intentions and concerns among Racialized minority and Indigenous peoples in Canada. Soc Sci Med. 2022;313:115400.
77. Sidner S, Simon M, Rappard AM. How a Native American elder told his story to encourage his daughter to get a Covid shot. CNN. 2021. https://www.cnn.com/2021/03/25/us/oklahoma-osage-nation-covid-vaccines/index.html. Accessed 18 Feb 2024.
78. First Nations Information Governance Center. Strengths-Based Approaches to Indigenous Research and the Development of Well-Being Indicators. FNIGC

Research Series. 2020. https://fnigc.ca/wp-content/uploads/2021/05/FNIGC-Research-Series-SBA_v04.pdf. Accessed 18 Feb 2024.
79. Ortiz-Paredes D, Varsaneux O, Worthington J, Park H, MacDonald SE, Basta NE, et al. Reasons for COVID-19 vaccine refusal among people incarcerated in Canadian federal prisons. PLoS ONE. 2022;17(3):e0264145.
80. Dudgeon P, Collova JR, Derry K, Sutherland S. Lessons learned during a rapidly evolving COVID-19 pandemic: aboriginal and Torres Strait Islander-Led mental health and wellbeing responses are key. Int J Environ Res Public Health. 2023;20(3):2173.
81. Epperson AE, Carson SL, Garcia AN, Casillas A, Castellon-Lopez Y, Brown AF, et al. A qualitative study of COVID-19 vaccine decision making among urban native Americans. Vaccine: X. 2022;12:100212.
82. Butler-Jones D. Health Canada apologizes for body bags. CBC News. 2009. https://www.cbc.ca/news/canada/manitoba/health-canada-apologizes-for-body-bags-1.790351. Accessed 23 May 2024.
83. CBC News. Ottawa sends body bags to Manitoba reserves. 2009. https://www.cbc.ca/news/canada/manitoba/ottawa-sends-body-bags-to-manitoba-reserves-1.844427. Accessed 22 June 2024.
84. Adach K. They sent body bags and toe tags. She made a ribbon dress. CBC Radio. 2021. https://www.cbc.ca/radio/unreserved/indigenous-fashion-the-politics-of-ribbon-skirts-runways-and-resilience-1.6034149/they-sent-body-bags-and-toe-tags-she-made-a-ribbon-dress-1.6043389. Accessed 23 May 2024.
85. Lett D. Emergency department problems Raised at Sinclair inquest. CMAJ. 2013;185(17):1483–1483.
86. College of Family Physicians of Canada. Remembering Joyce Echaquan. 2022 https://www.cfpc.ca/en/news-and-events/news-events/news-events/news-releases/2022/remembering-joyce-echaquan. Accessed 18 Feb 2024.
87. Green MC, Brock TC. The role of transportation in the persuasiveness of public narratives. J Personal Soc Psychol. 2000;79(5):701–21.
88. Wodak R. The Politics of Fear: What Right-Wing Populist Discourses Mean. London: SAGE Publications Ltd; 2015. https://sk.sagepub.com/books/the-politics-of-fear. Accessed 18 Feb 2024.
89. Azarpanah H, Farhadloo M, Vahidov R, Pilote L. Vaccine hesitancy: evidence from an adverse events following immunization database, and the role of cognitive biases. BMC Public Health. 2021;21(1):1686.
90. Schwarz N, Sanna LJ, Skurnik I, Yoon C. Metacognitive experiences and the intricacies of setting people straight: implications for debiasing and public information campaigns. Advances in experimental social psychology. Volume 39. Academic; 2007. pp. 127–61.
91. Dahlstrom MF. The narrative truth about scientific misinformation. Proc Natl Acad Sci. 2021;118(15):e1914085117.
92. Center for Addiction and Mental Health. Maad'ookiing Mshkiki - Sharing Medicine. 2021. https://www.camh.ca/en/camh-news-and-stories/maadookiing-mshkiki-sharing-medicine. 18 Feb 2024.
93. Qikiqtani Inuit Association. COVID-19 Initiatives. 2024 https://www.qia.ca/covid-19-initiatives/. Accessed 18 Feb 2024.
94. Protect Our People MB. 2024. https://protectourpeoplemb.ca. Accessed 18 Feb 2024.
95. Garrett MT, Parrish M, Williams C, Grayshield L, Portman TAA, Torres Rivera E, et al. SS J Youth Adolescence. 2014;43(3):470–90.
96. Marshall A, Bartlett C. Traditional Knowledge meets Western Knowledge Two-Eyed Seeing: an old-new way of bringing together different perspectives. Government of Nova Scotia - Office of Aboriginal Affairs Learning Seminar. 2010. http://www.integrativescience.ca/uploads/articles/2010February-Bartlett-Marshall-Integrative-Science-Two-Eyed-Seeing-Mi'kmaq-Western-knowledge-learning.pdf. Accessed 18 Feb 2024.
97. Power T, Wilson D, Best O, Brockie T, Bourque Bearskin L, Millender E, et al. COVID-19 and Indigenous peoples: an imperative for action. J Clin Nurs. 2020;29(15–16):2737–41.
98. Riess H. The science of empathy. J Patient Experience. 2017;4(2):74–7.
99. Anishinabek News. Connecting Indigenous communities with culturally-relevant COVID-19 vaccine information. 2021. https://anishinabeknews.ca/2021/02/20/connecting-indigenous-communities-with-culturally-relevant-covid-19-vaccine-information/. Accessed 18 Feb 2024.
100. Indigenous Watchdog. Call to Action #23. 2024. https://www.indigenouswatchdog.org/cta/call-to-action-23/. Accessed 28 Feb 2024.
101. Iseke-Barnes J, Danard D. Reclaiming Indigenous representations and knowledges. Diaspora Indigenous Minor Educ. 2007;1(1):5–19.

Publisher's note