

Nicole Burns <https://orcid.org/0000-0002-6944-5097>

Melody Morton Ninomiya <https://orcid.org/0000-0002-0196-3410>

Anita Benoit <https://orcid.org/0000-0001-9863-0278>

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ABSTRACT

Background In Euro-Western forms of research, Indigenous Knowledges (IK) and Knowledge Systems have been misused, devalued, and stolen. Elders and Knowledge Guardians have expressed the need for IK to be protected for future generations and be included in research in a good way.

Objectives We aim to disrupt the ongoing dominance of Eurocentric research methodologies focused on Indigenous Peoples by promoting and nurturing rights-based and distinctions-based approaches that center Indigenous ways of knowing, being and doing within the entirety of this research project.

Methods This protocol paper describes how we developed an Indigenous-informed realist review process and what the process entails. When conducting our realist review, we will examine papers indicating that IK were centered in research. Our iterative process is shaped and guided by IK within our team. To be included in the analysis, papers must 1) identify how Indigenous Peoples were leading, guiding, and/or governing the research; 2) describe how IK were a critical component of research; and 3) report on how the research benefitted Indigenous Peoples. All papers that meet our inclusion criteria will be scored using a relevance assessment tool we developed to assess how much information was provided on the local context for the Indigenous research, the outcomes from the IK in research, and the processes that facilitated the research outcomes.

Conclusion Our intention is to synthesize and amplify how IK have been centered in research, across multiple disciplines and geographies, to benefit Indigenous Peoples. We will focus on nurturing and fostering ways of doing Indigenous research and including IK in a way that supports the wellbeing of Indigenous Peoples.

Background

Indigenous Peoples have lived, survived, and thrived on the lands since time immemorial and have developed intrinsic connections between the *tmicw* (land), *séwllkwe* (water) and all *kwséltktenews* (relations) that exist within Mother Earth. Through this interconnected web lies Indigenous Knowledges (IK), including knowledge systems and structures. Each family, community, and nation have their own distinct and diverse languages, cultural practices, traditions, history and worldviews that contribute to the understanding of what the term IK means. IK continues to be passed down from generation to generation through intergenerational communication systems, with tangible and intangible elements such as languages, songs, dance, oral teachings, ceremonies, storytelling, traditional regalia, artwork, and more. Indigenous Knowledge systems are dynamic and transformational as they live, remember, and (re)connect to the genetic memories and interconnections with the land, living beings, and spirit.^{1,2}

The world of academia tends to recognize, train, and support colonial and colonized forms of research that “creates” knowledge or evidence.^{3,4} Academics and academic institutions have longstanding histories of ignoring and discrediting IK,^{5,6} excluding IK and people who do not conform to academic rules and credentials,⁷ gatekeeping and possessing IK, as well as commercializing and profiting from IK and Indigenous Peoples.^{8,9} In short, the notion of knowledge as something to find, keep, and control in exchange for gaining clout, money, credit, and career advancement is colonial and very much aligned with how academic institutions continue to function today.

Many Indigenous Peoples have asserted that Indigenous research is ultimately about accessing and sharing existing wisdom and Knowledges. Moreover, wisdom and Knowledges are inherent within the land and all beings, as well as in People's memories, including blood memory.^{1,2} Indigenous Peoples, as Nations and groups have distinctly different IK and more often than not, agree that IK is relational – in physical and spiritual realms of all living beings, across time and space.¹⁰ How IK is shared, practiced, and understood can also greatly vary by the sacredness of the Knowledges, ceremony and cultural protocols, People's roles and responsibilities to/with the land, within families and communities, and beyond.¹⁰⁻¹²

In Euro-Western forms of research, Indigenous Knowledges, systems and structures have been, and continue to be, marginalized, misrepresented, misappropriated, devalued, and stolen. Indigenous Elders and Knowledge Guardians¹ have expressed frustration with experiences of having their Knowledges exploited, not treated with care or respect, and not used in a way that it was intended. Elders and Knowledge Guardians have emphasized the importance of preserving Indigenous Knowledge (IK) for future generations, ensuring its respectful inclusion in research, and safeguarding it from exploitation by individuals outside the community. We aim to disrupt the historical and on-going dominance of Eurocentric research methodologies focused on Indigenous Peoples by promoting and nurturing rights-based and distinctions-based approaches that center Indigenous ways of knowing, being and doing within the entirety of this research project.^{4,5,13,14} To begin this work, we as a team acknowledge the Indigenous principles of relationality and protocols of self-location in reference to the traditional and occupied territories

¹ We use these terms to acknowledge and honor the diverse Traditional Knowledges and Knowledge systems expressed through community members, who may be referred to as Elders, Grandmothers, Grandfathers, Knowledge Holders, Knowledge Keepers, Old Peoples, Old Ones, and other local terms related to *kwséltktenews* (all our relations) within Indigenous communities.

and lands of Indigenous Peoples.^{4,14,15} Each author and contributor to this research project has provided a brief self-location statement to identify themselves. Recognizing our relationality connects us to our past, present, and encompasses the numerous responsibilities we carry in connection to our social location, including our lands, families, and communities. We believe who we are informs the epistemology and ontology of our research.

Self-Location Statements

Josie Auger is a nehiyaw iskwew of Bigstone Cree Nation in Treaty 8. Currently, she is an Associate Professor at Athabasca University in the center of Interdisciplinary Studies. **Anita C.**

Benoit is Mi'kmaw and French Acadian with family in Esgenoopeitj First Nation and Brantville, New Brunswick. She is an Assistant Professor in the Department of Health and Society at the University of Toronto Scarborough. **Simon Brascoupé**, (they/them)

Anishinaabe/Haudenosaunee – Bear Clan is a member of Kitigan Zibi Anishinabeg, Maniwaki, Quebec living in Algonquin territory in Ottawa. They are an Adjunct Research Professor, Department of Sociology and Anthropology, Carleton University and Associate Graduate Faculty, Indigenous Studies, Trent University. **Mona Lisa Bourque Bearskin** is a member of

Beaver Lake Cree Nation, Associate Professor and BC Chair Indigenous Health Nursing working as an uninvited guest on the traditional unceded territories of T'kumlups te Sewepemc where Thompson River University, School of Nursing is located. **Nicole Burns** (she/her) is a white settler born on the lands of the Pequot, Mohegan, and Eastern Nehântick Nations. She now resides on the traditional territories of the Attawandaron, Anishnaabe, and Haudenosaunee peoples. **Marcia Friesen** (she/her) is a white, cisgender woman and Canadian settler of European ancestry who lives on Treaty 1 Territory and the homeland of the Métis Nation, in

what is now called Winnipeg, Manitoba. Currently, she is Professor in the Center for Engineering Professional Practice & Engineering Education, University of Manitoba.

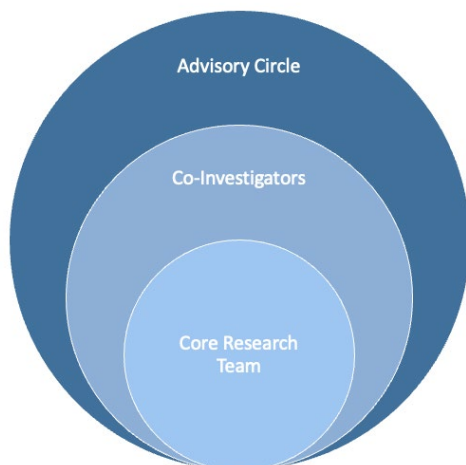
Ningwakwe (Priscilla) George is an Anishinaabe Kwe from Saugeen First Nation (SFN) where she holds several positions including the Visiting Elder at the local high school, researcher on mental wellness initiatives, hospice coordinator, and an active SFN community member. **Jaiden Herkimer** (she/her) is of mixed Anishinaabe and European-settler ancestry, and is a member of the Mississaugas of the Credit First Nation. She currently resides within the bounds of the Between the Lakes Treaty (No. 3), in what is now called Simcoe, Ontario. **Nikki Rose Hunter-Porter** (she/her) is Secwépemc First Nations and is a community member of St'uxwstews within the interior of BC. She currently lives within Secwépemulwc in her home Nation within the unceded, occupied, and traditional territory of Tk'emlúps te Secwépemc, Kamloops BC. **Janet Jull**, a settler of Euro-Canadian descent, is a Researcher and Assistant Professor in the School of Rehabilitation Therapy, at Queen's University. Janet is grateful to live on the traditional unceded territories of the Algonquin Nation. **Tina Lanceleve** (she/her) is a Cree Métis woman with birth roots in Treaty 8 area but was raised in Treaty 6 territory, the traditional territories of the Nehiyaw (Cree), Denesuliné (Dene), Nakota Sioux (Stoney), Anishinaabe (Saulteaux), Niitsitapi (Blackfoot) and Métis people. She currently resides in Amiskwaciy Waskahikan (Beaver Hills House) now called Edmonton, Alberta. **Janice Linton** (she/her) is descended from Scottish and English settlers; born and raised in Nogojiwanong (Peterborough, Ont), on the traditional lands of the Michi Saagiig (Mississauga) Anishnaabeg. She is responsible for maintaining the University of Manitoba Libraries' Indigenous Health Collection and Services. **Melody Morton Ninomiya** (she/her) is a settler of Japanese and Swiss-German Mennonite heritage and upbringing. She currently works at Wilfrid Laurier University and lives with her family on the

Dish with One Spoon Treaty territory. **Joanna Nemeth** is a guest on Turtle Island. Her family immigrated from Western Europe and were refugees from Eastern Europe, who fled during the Hungarian revolution. She is currently enjoying the grasslands on Treaty 7 territory but spent most of her life on Treaty 6 and 8 territories. **Noé Préfontaine** (they/them) is a queer, disabled, Two-Spirited Métis person from the Red River Valley, known colonially as Winnipeg, where their ancestors have lived for many generations. They are a master of social work student at McGill University. **Diane Simon** (she/her) is Mi'kmaw, and whose paternal bloodlines are Gitksan. She is a registered member of Fort Folly First Nation, a trained midwife and holds a master's in public health. Diane currently resides in Tkaronto/Toronto.

Team Structure and Purpose

Our research team consists of an Advisory Circle, Co-Investigators, and a Core Research Team. The Advisory Circle provides guidance, wisdom, and mentorship to the rest of the team.

Figure 1 Team and Project Governance



They have helped to identify common principles and inform research methodologies and knowledge sharing priorities. The Co-Investigators are responsible for developing, testing, and using research protocols and tools, based on guidance from the Advisory Circle. The Core Research Team is a combination of Co-Investigators and trainees (primarily Indigenous students or recent graduates). The Core Research

Team is responsible for conducting most of the research, after the protocols have been developed. There is an extensive element of formal and informal mentorship on this project that

flows in all directions between the Advisory Circle, Co-Investigators, and the trainees, which is highlighted in a previous manuscript (Simon et al., 2023).

As authors, we are a diverse group of Indigenous and non-Indigenous scholars working across disciplines, institutions, geographies, nations, and communities. Our unique positionalities and intersectionalities are interconnected and situated within *tmicw*, the land, where our ancestral footprints were born and our People's legacies continue. We are passionate about exercising (and protecting) the inherent rights of Indigenous Peoples, which includes the preservation of IK. The intention of our research project is to conduct an Indigenous-informed realist review (the methodology is described in this paper) and explore the findings in connection with several case studies that we are conducting in tandem. In our realist review and Indigenous case studies, we will examine research that demonstrates Indigenous Peoples' sovereignty, self-determination, agency (Article 3 of UNDRIP) and the right to control, protect, develop, and maintain IK (Article 31 of UNDRIP).¹⁶ Our intention is to amplify how existing IK are included in research, across multiple professions, areas of expertise, and geographies, to benefit Indigenous Peoples, communities, and Nations. We will amplify such Knowledges with a focus on the beneficence of nurturing and fostering ways of doing Indigenous research and including IK in a way that advances the overall wellbeing of Indigenous Peoples.

We are leveraging both historical and current Knowledges and relationships, thinking ahead to future generations. Our aim is to create secure spaces for those working alongside us, and coming behind us, enabling them to navigate systems of power such as academia and government funding. We want to learn from the past and better understand assumptions and biases about Indigenous Peoples, to generate safe spaces for Indigenous peoples and IK. In particular, we want to generate safer spaces for distinct bodies of IK, Indigenous research,

Indigenous Peoples, and respect Indigenous Peoples' sovereignty, self-determination, and agency. Our Indigenous (home) communities motivate us to support our Elders and Knowledge Keepers, as well as protect communities from exploitation, extraction, and ongoing harms, especially by corporations and institutions. Our team recognizes that protecting Indigenous Peoples right to self-determination, intellectual sovereignty and Knowledge sovereignty is the only way to support the rights of Indigenous Peoples, and they are committed to take action with the guidance of Indigenous partners.

Purpose of this Protocol Paper

In keeping with Indigenous Research Methodologies, our team recognizes the importance of the *how* and *why* behind our study. This protocol paper details the processes we have gone through in order to design an appropriate and rigorous realist review methodology. This paper details the search strategy, inclusion/exclusion criteria, and proposed analysis that we will complete for our realist review. The findings from the realist review will be published in a future paper.

A realist review is a theory-driven approach for synthesizing evidence in literature.¹⁷ Typically, a realist review aims to explain or understand why interventions may or may not work within specific contexts. In our case, our review has one main objective: to explain and understand how IK in research has been used in “a good way” to the benefit of Indigenous Peoples. We will do this using Indigenous worldviews to examine the context(s) in which research took place (e.g., what/who initiated the project), the mechanisms as to how the research was conducted, and the outcomes of the research (e.g, intended and unintended impacts, the interactions between contexts and mechanisms).¹⁸ The results of the realist review will weave

together both theoretical understandings and empirical evidence, with a focus on the relationality between the context in which the intervention is applied, the mechanisms that move it forward, and the produced outcomes.

Defining Indigenous Knowledges

Our team agreed that the idea of defining IK is problematic, with a range of complications. However, we think it is necessary to define our working IK definition if we are going to write about IK. The idea of drafting and contextualizing a definition for Indigenous Knowledges has been at the heart of numerous conversations with our team. We discussed the implications of presenting a single statement that honours the breadth, depth, and interconnection of relationships within our own Indigenous ways of knowing, and if we could do this in a good way. Emerging from these conversations and gathering, reviewing, and discussing numerous definitions and descriptions for IK, it is with great humility that our team proposes the following working definition for the purposes of this project:

Indigenous Knowledges are living, contextualized, and rooted in languages, cultures, traditions, and lands which are dynamic, diverse, and interconnected systems that contain ancestral, communal, holistic, and spiritual Knowledges that encompass every aspect of living existence, past, present, and future.

This definition was developed by reviewing and reflecting on the works of several Indigenous Elders and scholars, including those involved in this project.^{11,12,19-27} The reason for including a working definition is two-fold: 1) we need to discuss how we distinguish IK so that we can have a shared understanding of what we will include in the realist review and 2) we need to articulate

to others how we use the term IK in the context of our project, as we share findings from the realist review.

Research Questions

Our realist review aims to answer the following research questions:

1. **What are the contexts in which IK are included in research?** For example, who is leading/guiding research? Who funds the research? Are there disciplinary differences?
2. **How are IK included in research?** For example, what types of IK? Who is sharing the IK? Which parts of the research are IK being included? What research methodologies and methods are being used? How are IK gathered, preserved, used, and shared?
3. **What are the benefits and other outcomes to Indigenous Peoples from including IK in research?**
4. **What helps or hinders how IK benefits Indigenous Peoples?**

The desired outcomes from our review are to: 1) explicate how local Indigenous languages, concepts, and worldviews within Indigenous research contexts have been included, and to what end (in a culturally appropriate way) and 2) use the findings to occupy space and assert Indigenous Peoples' Knowledge systems in Eurocentric academic spaces and systems (e.g. research funding, published literature, research training).

Methodology

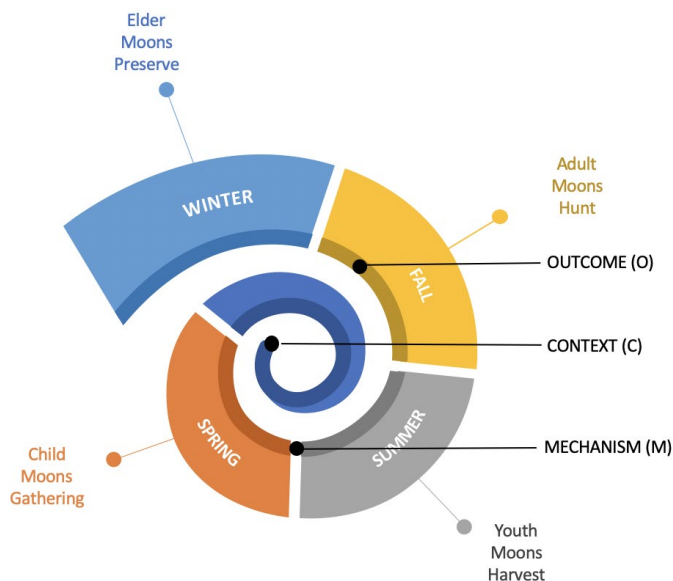
Our realist review involves an iterative process shaped and guided by Indigenous ways of knowing, being, and doing. Rather than starting with the realist review process, as is established

in non-Indigenous bodies of literature, the team committed to developing and using Indigenous Research Methodologies (IRM) as an overarching framework to gather and analyze existing literature.^{4,5} This review will be completed in tandem with a series of Indigenous case studies (which will be described in a future manuscript). The case studies will complement the realist review by offering in-depth and nuanced first-person perspectives and include undocumented accounts to answer similar research questions as this realist review.

Through shared reflections, teachings, and discussions, our team drafted and refined an image to conceptualize our review, using different yet reconcilable ways of knowing (Figure 2). This image reflects a spiraling and iterative way of doing. Clarifying the intent behind the realist review, the purpose, and the desired outcomes laid the foundation for this process. We came together to discuss the theory behind an Indigenous-informed realist review and decided if and how we could attempt to bridge Indigenous and western bodies of knowledges and knowledge systems to ensure this realist review is conducted in a good way. In other words, we have adapted a western-oriented method of examining literature to be more congruent with Indigenous Knowledge paradigms, processes, and practices of Indigenous team members. In some IK, the circle and medicine wheel teachings are divided into the four sacred directions; four seasons of the year (spring, summer, fall, and winter); four stages of life (child, youth, adult, and elder); four interwoven elements of wellness (spiritual, mental, emotional, and physical). As the sacred circle grows year after year, it creates a spiral pattern which represents wisdom in many cultures around the world. We understand research as inseparable from past and present events, and it will continue to impact the future; it builds on existing Knowledges and will contribute to future Knowledges and events. In this vein, our research begins inside the spiral (context), the

processes and journey we experience (mechanisms) during this research will take place in the middle, and outcomes will inevitably emerge and continue - likely spawning new research contexts/beginnings as the spiral continues in a circular pathway. It was essential that our team came together to agree on this conceptual understanding of *why* and *how* we could undertake such an important project.

Figure 2 Framework for the Indigenous-informed realist review Conceptualized by Simon Brascoupe with input from Lisa Bourque Bearskin



Developing a Preliminary Draft Context-Mechanism-Outcome Theory

We drafted an initial context-mechanism-outcome (CMO) pathway theory based on the extensive Knowledges and experiences of our team in IRM and Indigenous community-based research; developing theory about contexts, mechanisms and outcomes is in keeping with realist review methodologies.¹⁷ The project coordinator and co-principal investigators developed an

initial CMO theory based on past community-based research and the shared experiences and commonalities of this type of research with Indigenous Peoples as well as reviewing larger team meeting transcripts. Following numerous discussions, this preliminary image was presented to the trainees and early career researchers for collective discussion and theorization. Some changes were made based on further discussion. This preliminary draft image was useful in grounding the trainees in the concepts of community-based research and drawing attention to what CMO pathways might look like in the literature. The CMO theory will be revised after the final analysis and shared with the results of this review.

After this preliminary draft theory was developed, we asked all team members to share studies that they were familiar with that incorporated IK and provided examples of working with Indigenous communities in a good way. Team members also conducted some preliminary literature searches to look for good examples. Our team of trainees were tasked with reading the studies and developing CMO pathway figures for each article. They were given artistic freedom to draft images/figures to depict the distinct relationships of context, mechanisms, and outcomes. For each study,²⁸⁻⁴⁵ 2-5 trainees drafted detailed CMO figures; at least one Indigenous trainee was required to draft a figure for each study. A sample of these figures can be seen in a reflexive manuscript co-written by several trainees and mentors on this project⁴⁶ as well as in Supplementary File 1. Each week, the trainees met virtually with the co-principal investigators, and occasionally other team members, to share and discuss draft CMO figures with each other, with a critical lens. The weekly trainee meetings and discussions also helped to refine the screening criteria, develop a relevance assessment tool, and draft extraction questions for the realist review (see Table 1 for extraction questions).

After the trainees completed CMO figures and discussed all 18 articles, they each looked across all completed CMO figures to observe overarching themes and concepts. Each trainee created a CMO figure that represented the majority of papers analyzed to date. They then met to share and discuss commonalities and differences between their figures to eventually create a summary table of the overarching CMO pathway themes. Based on the summary table that was discussed and refined by trainees and other team members, a figure was shared with the full team, for feedback and input. This CMO pathway figure will be tested with the forthcoming literature that will be screened and analyzed, based on a comprehensive search strategy developed by librarians with expertise in Indigenous literature searches.

Search Strategy Methodology

The following three searchable database portals were selected for identifying peer-reviewed journal articles: Scopus, ProQuest, and EBSCOhost. Each searchable online index includes several databases covering the sciences, humanities, and social sciences in order to gather the widest range of published research that has used Traditional Knowledges or techniques between the years of January 2000 to December 2021. Results from the database search (n=12,317) were imported into Covidence™, a systematic review organizational software, where duplicates were removed. After all duplicates were removed in Covidence™, the total number of articles remaining to be screened at the title and abstract phase was 10,587 (a sample search string can be found in Supplementary File 2).

Eight Indigenous research journals were selected for team members to manually screen articles published between 2000 and August 2022. These scholarly journals were selected because they are Indigenous-led, often feature Indigenous authors and collaborative practices, or

are not well-indexed in the commercial interdisciplinary databases. The Indigenous journals we manually searched and screened include: 1) Journal of Indigenous Social Development; 2) International Journal of Indigenous Health; 3) First Peoples' Child & Family Review; 4) International Indigenous Policy Journal; 5) Indigenous Policy Journal; and 6) Journal of Indigenous Wellbeing: Ti Mauri – Pimatisiwin; 7) Journal of Indigenous Research; and 8) Indigenous Knowledge: Other Ways of Knowing. All of the Indigenous journals are currently open access, and many have been publishing for several years. Team members scanned the tables of contents of issues going back to 2000 or since the first issue was published, if founded since 2000 as they screened titles and abstracts to identify papers that might meet the inclusion criteria described in the next section. Results from the manual search through Indigenous journals were imported into Covidence™ (n=165) where duplicates from the database search were removed (n=22).

Screening Criteria

For the title and abstract screening, all documents must meet the following criteria: 1) be primary research published or released in English between January 2000 - December 2021; 2) be research focused on Indigenous Peoples; 3) take place in Turtle Island (North America), Australia, Aotearoa New Zealand, and/or Central and South America.

All titles and abstracts from the database results will be included for full-text screening if they show promise of meeting the following inclusion criteria: 1) there is evidence that Indigenous Peoples were leading, advising, and/or governing the research; 2) there is a description of how IK were a critical component of the research process and/or findings; and 3) authors identify how the research benefitted Indigenous Peoples. Manually searched results from

Indigenous journals were essentially screened before being added to Covidence™ so they will be screened at the full-text screening stage.

Information to Gather for Analysis (Data Extraction)

All documents that meet the inclusion criteria will have relevant information gathered from the paper. Two team members will independently gather relevant information (commonly referred to as “data extraction” in reviews) for each article within Covidence™. A third team member will compare gathered information within Covidence™ and ensure that consensus was reached with information gathered. The final information will be exported into Excel and reviewed by the full team.

Our team developed a list of categories and questions to guide the information gathering of relevant information about the context, mechanisms, and outcomes of each document to test out with the same documents that were reviewed to develop our draft CMO pathways. We found that some of the original information gathering categories and questions required edits to help ensure consistent meaning for all researchers. The revised extraction categories and questions were reviewed and discussed between the co-principal investigators and the four Elders on the team individually, and then shared with the full team for review. The final data extraction categories include categories such as funding sources, who initiated the research and why, who was involved in the research and why, and what were the outcomes of the research spanning beyond the scope of the project. Table 1 lists all of the information gathering questions being used for the included literature found from the comprehensive search strategy.

Table 1. Information Gathering Questions

CONTEXT	Indigenous Peoples: Which Indigenous group(s), nation(s) or organization(s) were involved in the research?
	Location: Where does the research take place?
	Research aim(s): What are the community(ies) priorities tied to this research? What local factors prompted this research?
	Does the paper define and specify community? If so, how is community defined and by who?
	Field of study/discipline(s) (give examples)
	Research question(s): What do the author(s) identify as the research question(s)?
	Authors: Who are the (co-)authors on the document? (e.g. Indigeneity, affiliation)
MECHANISMS	Funding - What is the funding source and who held the funding?
	Methodology - What terms do the authors use to explain their methodology(ies)? (e.g., Indigenous Research Methodologies (IRM), decolonizing, community-based research principles, participatory action research, strengths-based approach)
	Methods - What are the research methods? (consider how research design is reflective of overarching project)
	Was the research initiated by community? If so, who initiated it?

	<p>If the research was initiated by outside researchers, how did they engage with the community?</p>
	<p>Is there evidence of self-reflexivity and/or self-location and positionality of the researchers? Include an example/excerpt.</p>
	<p>How was ethical approval sought/granted? (e.g., an institution, community, Chief & Council, Elders, and/or other?)</p>
	<p>Did the article talk about data sovereignty (Ownership Control, Access, and Possession (OCAP), Inuit Qaujimajatuqangit, or similar principles like Tri-Council Policy Statement – Panel on Research Ethics (TCPS2) or United Nations Declaration on the Rights of Indigenous Peoples)? If so, how?</p>
	<p>Is there evidence of any research agreements or formal partnership agreements? If yes, please specify. (consider pre-existing relationships)</p>
	<p>Is there any mention of ethical space or culturally safe space being made? If so, how was this done in the research?</p>
	<p>Relational accountability - Are relationships between researchers and community discussed? This includes relationships between the research team itself. If so, how? (e.g., relational reciprocity, ongoing relationships, existing relationships prior to research, relationships beyond timeline of the project)</p>

	<p>Which community members were part of the research process? We are interested in who was included/excluded (e.g., youth, Elders, two-spirited folks, women). How did everyone come to be involved in the project?</p>
	<p>How were Indigenous Peoples involved in the research? (e.g., advisory council, directing/leading the research, data collection, analysis, knowledge sharing)</p>
	<p>Is Indigenous Knowledge(s), or a comparable term, defined in the article? If so, how? Who is defining it?</p>
	<p>Is there anything in the article that aligns with the way the project has defined Indigenous Knowledge (or comparable term) that aligns with Indigenous Knowledge, the way we define it in the project?</p>
	<p>Are there efforts to share knowledge before, during and/or after the research project? If so, specify at which stage(s) and what ways (e.g., workshops, community feasts, community information sessions).</p>
	<p>What types of IK are mentioned in the article? (e.g., IRM, language, traditional skills, games, ceremony, traditional activities)</p>
<p>OUTCOMES</p>	<p>What are the reported outcomes of the research? (how has the research team provided feedback/communication of outcomes with community? Is sustainability of the work discussed?)</p>
	<p>Is there a clear connection or reported connection between IK and the outcomes? If so, specify.</p>

What other outcomes or benefits were there for participants and/or community(ies)? (e.g., results of the research itself and/or hiring, monetary compensation, authorship, further research opportunities, programming, services, training, long term relationships) (prompt: consider whether benefits are short-term, long-term, and/or whether there is evidence of follow-through)

Relevance Assessment Tool

When we gather relevant information from each included study, we will also score studies using a relevance assessment tool below (Table 2). This tool was developed based on the overall knowledge and expertise of the research team and their previous experience working on realist reviews. The tool was drafted and then discussed in several meetings; changes were made at various stages until consensus was reached.

Anticipating a wide range in which authors of included papers describe the context(s), mechanism(s), and outcome(s), we have developed this scoring scale to have an understanding of how well the CMOs are described in each document. At the analysis stage of looking across the included studies, we plan to spend time analyzing approximately the top 50 studies with the highest relevance assessment tool ratings because they will offer the most insight into the CMO pathways. We will have two members of our team draft a CMO figure for each of these articles, which will be used in the analysis.

Table 2. Relevance Assessment Tool

Criteria	Does not have a clear description	Has a partial description	Has a good description	Has an excellent description
	0	1	2	3
Context				
Mechanism				
Outcome				
Total Rating (combined score across all columns)	On a scale of 0-9			

Analysis

All study information will be gathered within Covidence™ (using Table 1 as a guide) and exported into an Excel document to be shared with the full team. All team members will have a chance to review the data individually before meeting as a large group to discuss initial observations. During our large team meeting, a smaller team will be identified to advance the in-depth analysis with trainees and project co-principal investigators. This smaller team will meet weekly while working through the analysis using an iterative process to discuss and refine the

themes and CMO figure(s). Once preliminary results are drafted, the large team will meet to share, review, and discuss preliminary findings. After final decisions are made with the full team, a CMO figure will be finalized.

Strengths and Limitations

A primary strength of this realist review methodology is the fact that we have a large and diverse team consisting of Elders, senior Indigenous scholars, early career researchers and trainees bringing lived experience and various levels of knowledge to the research, including team members that have conducted realist, scoping, and systematic reviews in the past. Another strength of this realist review is that our team has been working in partnership with each other and each team member is part of a larger network of interdisciplinary teams across institutions and geographies. Furthermore, this realist review has been designed with a mentorship focus. There is knowledge exchange happening across all levels from the Elders, Knowledge Guardians, senior scholars, early career researchers, and trainees. The Knowledges of all team members have been considered in every phase of the project and will continue to be moving forward. The protocol has been conducted through an iterative process, beginning with project conceptualization and design. This realist review, in connection with our larger IndWisdom project, is founded on relationships and ceremony. This means that developing and maintaining respectful relationships within the team, as well as with all research partners, is integral to this project. Moreover, all meetings and research processes are conducted with agreed upon protocols, which vary based on the context and purpose (e.g., offering gifts to Elders who facilitate sharing circles). Finally, our Indigenous-informed realist review challenges the notions of how knowledge synthesis can be done in that it is extending the research approach

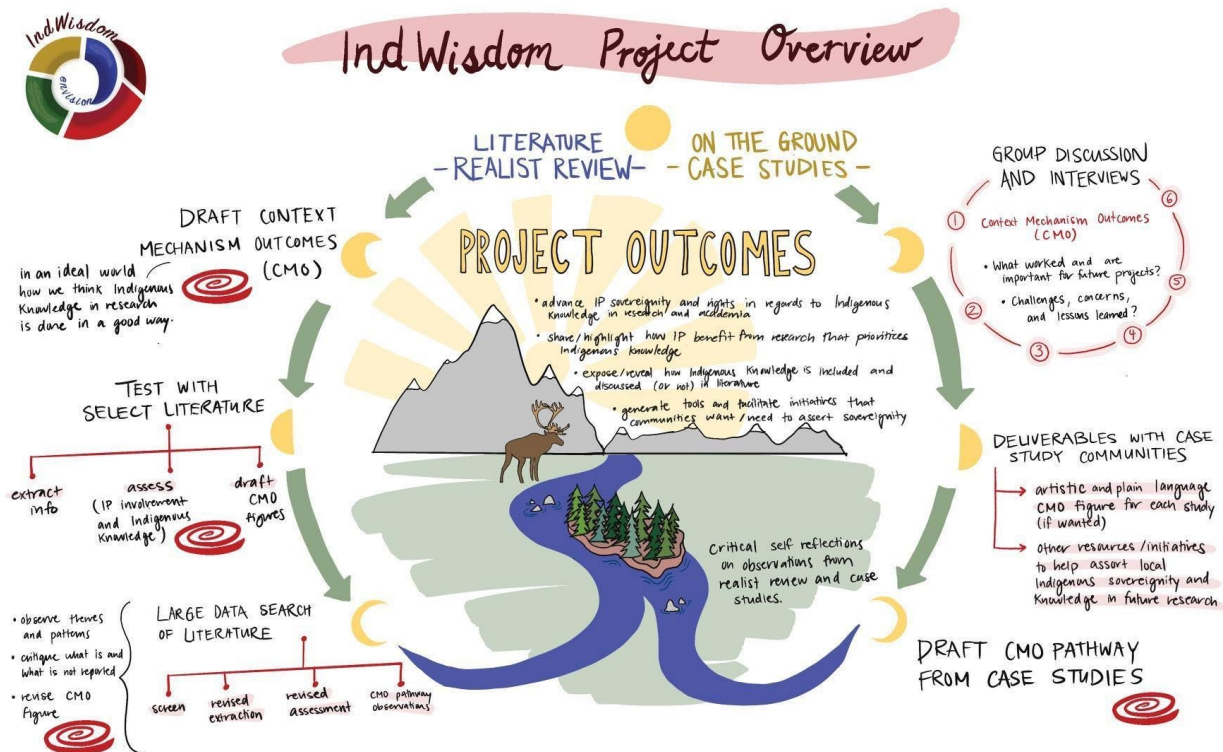
(knowledge synthesis) to be inclusive of more than just Eurocentric forms of knowledge, which is needed when working in Indigenous contexts.

Limitations of this realist review include: 1) examining literature printed in English from specific geographies while there may be rich and relevant literature from other places in the world and/or in other languages; and 2) our team does not currently include much Inuit representation.

This realist review is being conducted in tandem with a series of case studies. The case studies involve holding discussions with people most involved in a (nearly) completed research project to share, discuss, and unpack the contexts in which a study came to be, the outcomes from the study, and the mechanisms that facilitated the outcomes. The case studies will feature the perspectives, knowledge, and experiences of mostly Indigenous Nations and community members, as well as outside researchers, to hear about aspects of a research project that are not often included or fully described in literature. As part of a larger IndWisdom Project, the findings from this realist review and the case studies will - together - be used to advance Indigenous Peoples' sovereignty and rights with regards to IK in research and academic contexts, co-develop tools for Indigenous Nations and communities to assert IK and sovereignty in future research, reveal how IK is included and discussed (or not) in literature, and highlight how Indigenous Peoples benefit from research that prioritizes IK (see Figure 3). Our team will highlight wise practices for conducting research with Indigenous Nations and communities, based on included studies from the realist review as well as case studies. Knowledge sharing from the IndWisdom project will be iterative and ongoing in diverse ways, including: 1) hosting a gathering for our research and case study teams to network and brainstorm additional ways to share our findings effectively and strategically; 2) co-producing manuscripts with our research

and case study teams; 3) co-presenting at academic conferences; and 4) creating community reports and infographics.

Figure 3. IndWisdom Project Overview



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M'sit No'kmaq/kahkiyaw niwâhkômâkanitik/Niw_hk_m_kanak/ k'wséltktenews (All My Relations).

Ethics Approval

The realist review does not involve human participants and is exempted from a review by a research ethics board.

Author Contributions

NHP and NB drafted this manuscript with significant review and input from LBB, MMN, AB, RM, and JJ. The manuscript was reviewed and approved by all co-authors on the team.

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Competing Interests

The authors declare no competing interests.

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