Journal of Health, Population and Nutrition

RESEARCH

Open Access

On-the-ground realities of health program delivery in addressing community needs: a community-based participatory research approach in the moose Cree First Nation

Trisia Mae F. Balalio[1] and Michael A. Robidoux[2*]

Abstract

Background It has been well documented that Indigenous people in northern remote communities in Canada continue to experience a disproportionate burden of health disparities due to complex interactions of multiple determinants of health, including food insecurity, colonialism, barriers in accessing primary healthcare, and disrupted socioeconomic and political structures. Health promotion programs are essential in building preventive measures and empowering communities to take control over their health by helping them make informed health choices. This study described Indigenous-led nutrition-related health programs, the Healthy Babies, Healthy Children Program (HBHCP) and the Diabetes Prevention Program (DPP), which respond to food insecurity drivers and support community needs in Moose Cree First Nation (MCFN). It also documented the on-the-ground realities of program delivery and highlighted community-informed priorities for improved programming.

Methods Grounded in community-based participatory research (CBPR) principles, our approach emphasized the importance of community engagement in supporting the healing process within this cultural context. Data collection included first-hand participation in program delivery alongside program coordinators, participant feedback, and semi-structured interviews from community members ($n=6$) and Health Center staff ($n=3$). Thematic analysis was used to identify themes across interview data, field notes, and community feedback.

Results High food costs, limited access and availability, and poor food quality remain the primary food-related challenges experienced in the community. Health programs serve as frontline responders to community needs and address these challenges through culturally grounded and family-oriented nutrition education activities. Community members valued the programs' knowledge-sharing approaches, tangible support, and social connections. However, systemic barriers significantly constrain program delivery, including inadequate funding, limited resources, staffing shortages, and the impact of COVID-19. These barriers limited the programs' capacity to reach their full potential, despite strong community resilience.

*Correspondence:
Michael A. Robidoux
robidoux@uottawa.ca

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

Conclusion Indigenous-led nutrition programs are vital in addressing food insecurity and promoting health in northern communities. The findings underscore the need for sustainable funding and stronger policy support that reflects the true cost of service delivery in remote Indigenous communities. The findings emphasize the need for policy changes that move beyond top-down approaches toward community-informed policies and Indigenous-led health programming.

Keywords Community-based participatory research, Health promotion, Indigenous health

Introduction

Indigenous people in northern remote communities in Canada continue to experience a disproportionate burden of health disparities due to complex interactions of multiple determinants of health, including food insecurity, colonialism, barriers in accessing primary healthcare, and disrupted socioeconomic and political structures [1]. The onset of the COVID-19 pandemic has further exacerbated these systemic health challenges, severely restricting access to safe and nutritious food for these communities [2, 3]. Prior to colonialism, Indigenous people relied on traditional lands for nourishment and cultural sustenance; however, colonial disruption led to the loss of traditional food sources and local food systems [4–10] The transition to store-bought food presented additional challenges, including high costs, poor quality, and limited availability of healthful options, contributing to food insecurity in the north [11, 12]. The increased prevalence of food insecurity and gradual reliance on processed market-based food has resulted in inadequate intake of several nutrients, resulting in an increase in diet-related chronic health conditions such as obesity, type 2 diabetes, and chronic kidney disease [13, 14].

Recognizing challenges of food insecurity, northern Indigenous communities across Canada have developed community-led, local food initiatives that address the drivers of food security and support food sovereignty, such as community gardens and greenhouses [8, 10, 15–17], research collaborations with schools and Indigenous organizations food programs [18], and research-related health intervention programs like Healthy Foods North (HFN). HFN provided training to community members to implement community-based activities such as cooking classes and nutrition education, resulting in reduced consumption of unhealthy foods and improved food-related behaviors [19, 20]. Furthermore, Aboriginal Diabetes Initiative (ADI) also delivers prevention and health promotion programs to reduce type 2 diabetes and support food security initiatives in more than 600 First Nation and Inuit communities. These programs are often delivered through community health centers and health services, recognizing food security as a fundamental health determinant that requires integration into comprehensive healthcare alongside clinical care [21, 22]. However, many Indigenous communities navigate their way in the fragmented health governance structures where responsibility for Indigenous healthcare and the delivery of health services is divided among federal, provincial, and territorial levels, resulting in jurisdictional gaps and a lack of coordination [23–26]. For instance, the ADI is federally funded under the Health Transfer Policy (HTP) that aims to facilitate the transfer of control over the administration of programs to local communities through flexible funding agreements [27, 28]. However, programs funded by this policy operate separately from other federally funded services in the same community without data sharing or coordination [27]. With the onset of COVID-19, these issues were intensified as availability and access to a variety of health services were greatly reduced and replaced with virtual care [28].

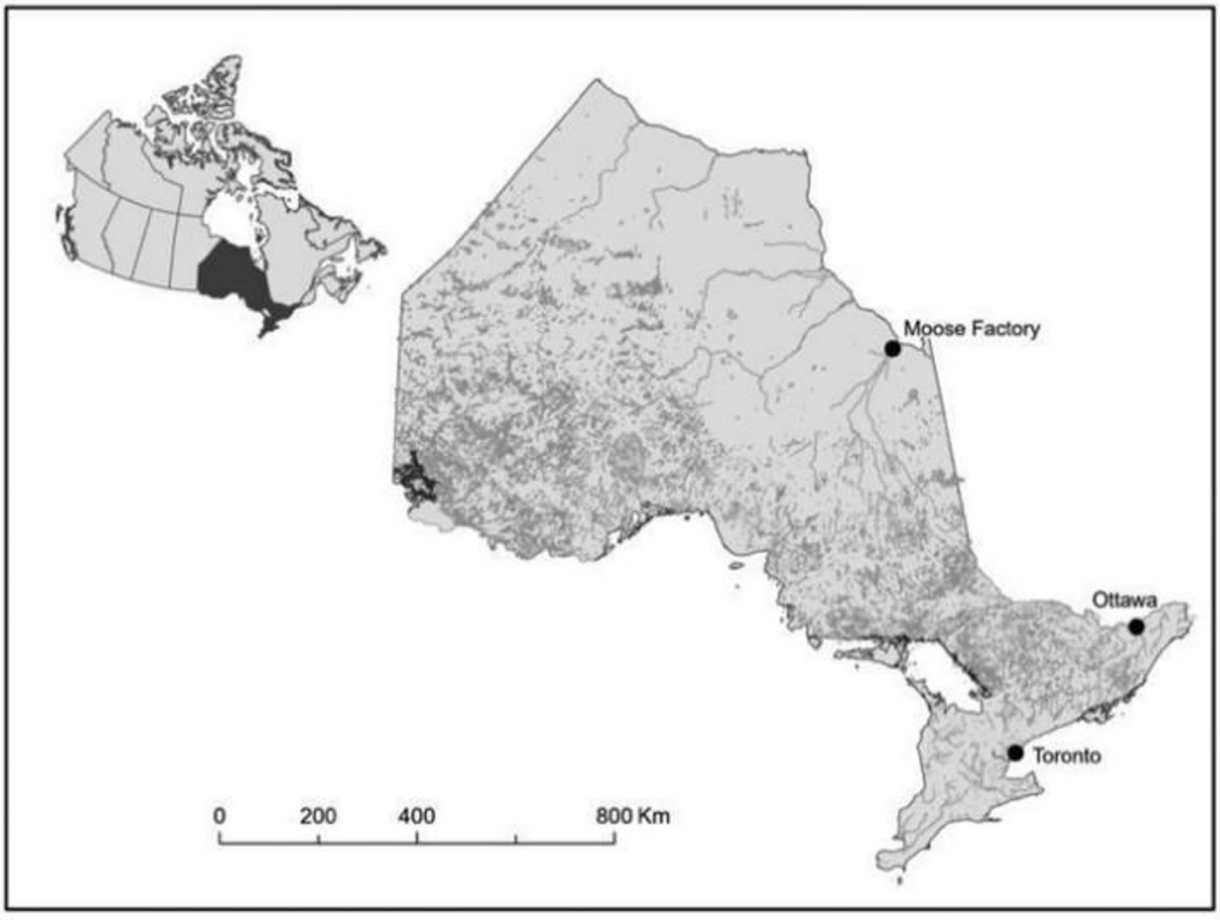
While many studies have documented community-led programs and health promotion initiatives in addressing causes of food insecurity and prevention of chronic diseases, there remains limited information on how communities independently respond to immediate needs related to food insecurity through their own health programs. Furthermore, previous studies identifying local needs and systemic challenges faced by remote health services in the north have largely relied on interviews, evaluation, sharing circles, literature reviews, and scoping reviews [8, 26, 29, 30]. This study builds on these gaps and methods, taking an additional approach through firsthand involvement and participation. It provides rich description of locally-driven activities and a lived understanding of how health programs experience and navigate systemic barriers in a remote, northern Indigenous community. Initially, the objectives of this paper centered on supporting and delivering program activities in Moose Factory; however, our objectives shifted after learning that, following the COVID-19 pandemic, these programs are in the process of restarting and rebuilding efforts, affected by multiple factors, including facility relocations and personnel changes. The objectives of this paper are to describe Indigenous-led efforts in responding to the identified drivers of food insecurity in the community through firsthand participation in health programs in Moose Factory in the context of post-COVID. Additionally, it also understands the broader role of programs within the community context, documents on-the-ground realities of program delivery, and highlights community-informed priorities for improved programming.

Community context

This project took place in the Moose Cree First Nation (MCFN) of Moose Factory, an island located in a remote northern part of Ontario and situated at the base of James Bay, at coordinates 51.264 latitudes and – 80.597 longitude [31] (see Fig. 1). The community has 5,160 registered band members, with 1,823 residing on the reserve [32]. It is only accessible by boat taxi during the warmer months and by winter road during the colder months. Additionally, helicopter services provide year-round access, which is crucial during the transitional freeze-up and breakup periods. Food is available and accessible for purchase at the Northern Store, private grocery stores, and the Farmers' Market that visits the community every two weeks [15]. However, the primary food source for most Indigenous peoples in the JHB region is the Northern Store, the successor of the Hudson's Bay Company, a monopoly that has been harshly criticized for its predatory practices across northern Canada [33].

Health services and Nutrition-related health programs in Moose Factory

In most northern remote communities, health services are primarily delivered through nursing clinics or health units, which serve as the first point of contact for individuals, families, and the community within the healthcare system [34]. Moose Cree First Nation (MCFN), as a larger community, has access to a provincial hospital for primary healthcare. The provincial hospital originated as the Moose Factory Indian and Inuit Hospital in 1950, initially constructed as a tuberculosis facility. It was later renamed the Moose Factory General Hospital (MFGH) in 1966 and became the regional healthcare facility for western James Bay communities. In 1996, governance transitioned from federal control under Health Canada



1. Map identifying the location of the northern First Nation community of Moose Factory in Ontario, Canada. Map created by University of Ottawa April 15, 2020.

Fig. 1 Map identifying the location of the Moose Cree First Nation, Moose Factory, Ontario, Canada. Map created by the University of Ottawa on April 15, 2020

Table 1 Health promotion programs in Ontario vs. in moose factory

	Mainstream Program		**Indigenous led-Programs [93]**	
	Ontario HBHC Program	**Ontario Diabetes Education Program**	**HBHC Program**	**Diabetes Prevention Program**
Funding	Ministry of Children, Community, and Social Services Delivered by Public Health Ontario	Ministry of Health Delivered by Public Health Ontario	Nishnawbe Aski Nation	Indigenous Services Canada + External grants
Service objectives	Health screening and risk assessments Developmental assessments Healthy mother-infant attachment Link to community resources and support Home visiting	Diabetes education and support for adults and families Diabetes counseling for patients and family members Life plans to minimize symptoms	Healthy mother-infant attachment Healthy infant growth and development Resources and supports Family Advocacy Indigenous teachings, ceremonies and resources **All activities are tailored to community needs*	Provides education and services for the prevention, management, and treatment of diabetes Provides case management and screening services Advises on developing and implementing an approach to the care and management of diabetes Provides referrals to other health care professionals **All activities are tailored to community needs*
Eligibility	Parents and their children under six years of age	All adults 18 years or older	Families with children younger than 6 years of age Indigenous children at-risk	Members of Moose Cree First Nation living with diabetes or at-risk Open to all community members
Application Process	a. Screening by a health provider after the birth of an infant b. Self-referral during prenatal or postnatal period	a. Referral from health provider b. Self-referral	a. Referral from health provider b. Self-referral	a. Referral from health provider b. Self-referral

to local management under the Weeneebayko Health Ahtuskaywin, while maintaining federal funding supplemented by provincial support for specific programs. Moreover, MCFN has its own Health Center focused on delivering health promotion programs that empower individuals and families to take control of their health through education, prevention, and addressing broader social determinants [35, 36].

The Moose Factory Health Center (MFHC) offers two nutrition-related health programs: the Healthy Babies, Healthy Children Program (HBHCP) and the Diabetes Prevention Program (DPP). The HBHCP supports families with children aged 0–6 by promoting healthy child development. It focuses on the five areas of child development - cognitive, language, physical, social, and emotional development. It provides neonatal care and prenatal support, while also offering programming for parental support and parenting skills development. This flexibility allows for adjustments to priorities and approaches to accommodate emerging community concerns. The funding structure also differs; the program receives funding through the Nishnawbe Aski Nation (NAN), a provincial territorial organization (PTO) representing approximately 49,000 people of 49 First Nations on and off reserves, rather than Ontario provincial funding.

Moreover, the DPP has been operating in the community for more than 22 years, providing services accessible to the entire community, from youth to elders. The program primarily focuses on prevention and awareness, not only of diabetes but also encompasses a broad spectrum of other health concerns, including heart disease, epilepsy, sexually transmitted infections, eye and foot care, and renal diseases. The program is partially funded by Indigenous Services Canada (ISC), which allocates resources sufficient only for the program coordinator's salary. Consequently, the coordinator secures additional external grants to maintain program operations and provide the necessary resources for effective delivery. Despite the extensive range of services and programming offered, both programs are managed by a single coordinator responsible for all aspects, from program design and planning to implementation and delivery. It is important to note that these Indigenous-led programs differ from mainstream programs (like the Ontario HBHC program) as greater flexibility is allowed within the community-based program, enabling adaptations when community needs are identified (Table 1).

Methodology

Community-based participatory research (CBPR)

This project revolves around the principles of community-based participatory research (CBPR), which is an approach for decolonizing research and

prioritize understanding and active collaboration between researchers and the community. It strives to develop innovative solutions to community challenges, with research being conducted for and with the community [39–42]. It emphasizes the importance of equitable partnerships and promotes the collaborative sharing of power, knowledge, and resources between academic researchers and community members at every stage of the research process and implementation [43, 44]. This approach generates evaluative knowledge, similar to conventional qualitative and quantitative methods, while integrating research with action. This yields knowledge that can inform healthcare practices, services, and organizations [45]. CBPR engages academic researchers and non-academic partners to effect sustainable change in an iterative framework of planning, action, implementation, and education thereby leading to reflective practice or a *"kind of action research that builds on and feeds back to modify what we already know-in-practice"* [46, 47] The principles of CPBR was applied throughout all study procedures, with four of them being relevant to the study. *"CBPR builds on strengths and resources within the community;" "CBPR facilitates collaborative, equitable partnership in all phases of the research;" CPPR promotes co-learning and capacity building among all partners;"* and *"CBPR integrates and achieves a balance between research and action for the mutual benefit of all partners"* [48]. This is to better understand the significance of local context and empower the voice of the local First Nations community [49].

Given that this is a CBPR project, it is important to highlight the steps that were undertaken to ensure community participation in all stages of the research, including project objectives, design, data collection, data analysis, and dissemination of results. The following outlines our partnership with the community and how CPBR is applied in the project.

1. *Building partnership and relationship*: This project builds on the ongoing partnership our research group has with the MCFN, focusing on supporting local food development, food sustainability, and strengthening long-standing community initiatives since 2018 [15, 37, 38]. The project initiated the partnership with MCFN after a Band Council Resolution was signed by community leadership supporting the project. The specific research presented in this article is also part of another initiative called Rivers of Plenty (RoP), which underwent a formal approval process following a joint proposal with all Health Directors in northern communities along the James and Hudson Bay Coasts.
2. *Co-defining and development of research questions*: Initial discussions took place during a sharing circle held in Moose Factory in May 2022, where community members identified nutrition and diet as key priorities to community health and well-being. These priorities were further refined in collaboration with program coordinators during fieldwork, as they were in the process of rebuilding their programs and re-engaging participants following the lasting impacts of COVID-19. Given that food insecurity remains a fundamental concern in the community, our early hands-on involvement in program delivery—from planning to implementation—provided valuable insight into how the health programs operate and respond to community needs in diverse ways. Furthermore, program coordinators and community health coordinator asked to strengthen existing nutrition-related programs that they currently have. These collaborative and experiential processes collectively shaped the direction of the study and guided the finalization of the research objectives.
3. *Data collection and analysis*: All project activities were co-planned and implemented in close collaboration with the program coordinators. These activities were rooted in existing program structures and priorities, ensuring that the research process aligned with ongoing community initiatives rather than introducing external interventions. The questions used to gather feedback from activity participants and community members were informed by the coordinators. During the data analysis, findings and preliminary interpretations were shared with the coordinators to validate and refine emerging themes. Through this iterative process of exchanging feedback, suggestions, and reflections, the analysis was strengthened by community insights and ensured to accurately represent local perspectives and experiences. This collaborative approach upheld the CBPR principle of shared ownership throughout the research process. The program coordinators were invited to be listed as co-authors of the article; however, they opted not to be included as they did not partake in the writing of the manuscript. Instead, they preferred to be mentioned for their significant contributions in the acknowledgements.

Indigenous methodologies

As non-Indigenous researchers, we acknowledge our social location and the potential biases we may carry. We recognize our relational obligation and responsibility to be critical of our privilege and the systemic inequalities we benefit from and to actively work to disrupt Western

hierarchies actively. This study is guided by Indigenous research methodologies that are grounded in Indigenous worldviews, perspectives, and ways of knowing [50–52]. Indigenous methodologies (IM) are informed by Indigenous knowledge-gathering methods that include ceremonies, stories, talking circles, traditional teachings, reflexivity, oral history, and place-based ways of doing and being [51, 53]. Kovach points out that these methods may differ from Western-based ones, such as focus groups, interviews, and surveys, and argues that *"Indigenous researchers count inward knowing ways as part of knowledge construction and referencing methods, subsequently legitimizing them in academic research"* [51]. IM calls for research that is done with relevance, reciprocity, respect, and responsibility [54]. While a CBPR approach involves researchers and participants in all aspects of the research process, IM goes further [51, 55–57]. By advocating for community-centered priorities and valuing Indigenous knowledge systems, this study seeks to foster research practices that are equitable and just [58, 59].

A Strength-Based approach

This study adopts a strengths-based approach rather than a deficit-oriented lens. Instead of focusing on gaps or shortcomings, this approach highlights the broader value of health programs in addressing immediate needs in the community and examines how existing resources can be improved and leveraged to improve program delivery [60]. The goal is to build on the knowledge and assets already embedded in the MFHC programs that best address the community's unique needs and challenges, taking into consideration geographical isolation, population size, and current approach to health program delivery.

Project design and development: fieldwork phase I

In this project, researchers worked in partnership with the MFHC to gain a comprehensive understanding of the on-the-ground realities of program delivery for the HBHCP and DPP, including operational challenges faced by these initiatives. Community engagement occurred at two distinct levels in a flexible manner based on the objectives of the study and the interests of program coordinators and community members. First, the program coordinators were fully integrated in all phases of the research - needs assessment, definition of research questions, implementation, data collection, and analysis - and played multiple roles as practitioners, researchers, and knowledge users. They are part of both the process and the outcomes. Second, academic researchers and program coordinators worked with community members by delivering the activities and seeking feedback on their experiences with the programs. This offers valuable insights and experience into how well the current activities were working while also allowing for deeper engagement with the community to identify additional needs and support. This study involved two phases of fieldwork comprising multiple stages of fieldwork conducted in Moose Factory at different times, as outlined in Fig. 2.

Stage 1 During the first in-person visit and interaction with the community for two weeks in the spring of 2024, stage one involved engaging with local residents while supporting the ongoing local food development initiatives and helping them set up their community gardens for their families. This facilitated informal conversations with community members, providing valuable insights into their food access challenges and how gardens help conserve financial resources otherwise spent at the Northern Store. We also focused on understanding MFHC operations, particularly program implementation and management. Discussions with program coordinators helped identify areas where we could best support these programs, assess their needs, and determine the future direction of the study. During these discussions, it was brought up that the COVID-19 pandemic halted many key activities of the programs, such as cooking workshops, food demonstrations, and nutrition education sessions, all of which are essential for promoting nutrition, health, and overall wellness. Additionally, they expressed the need for support in translating nutrition education into practical, culturally relevant materials. While there are existing resources such as "First Nations Recipes by Gregory Lepine", a recipe book featuring traditional Indigenous

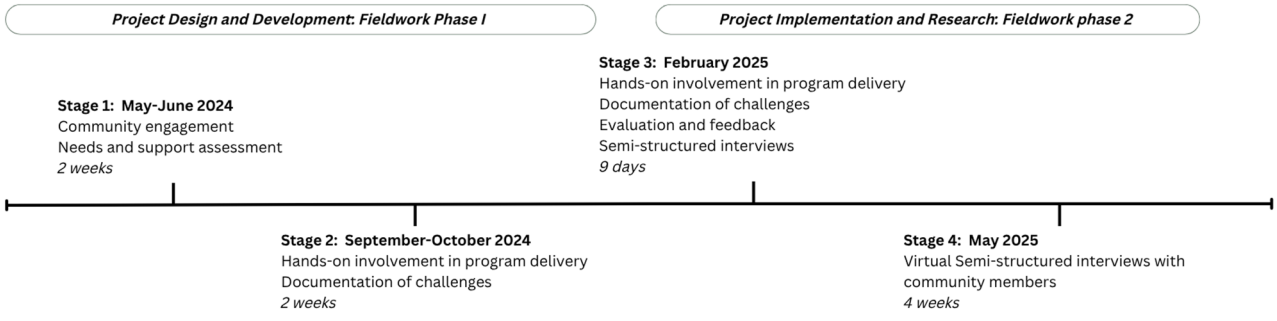


Fig. 2 Timeline of fieldwork throughout the research

ingredients like salmon, venison, bison, fiddleheads, wild rice, and berries, the program coordinator of DPP from Moose Factory explained that many of these ingredients are unavailable at the Northern Store, the primary food source in the community (Personal correspondence, June 26, 2024). These preliminary discussions on the need for additional nutrition educational materials led to the draft production of learning resources. These included flyers featuring quick, easy, and healthful recipes, as well as posters and placemats highlighting traditional foods such as moose, goose, and fish, with nutritional information about these foods. All of these materials were collaboratively developed to ensure they were community-centered, with consistent exchange of ideas and suggestions between the program coordinators and our team.

Stage 2 The second stage of the fieldwork was conducted from September to October 2024 over two weeks. During this phase, we engaged in further discussions and hands-on involvement with the program activities to gain a clearer understanding of how they work in the community setting. Throughout this period, we engaged directly in all aspects of program delivery—planning, preparation, and implementation of activities, alongside the program coordinators. This phase also allowed us to better understand the program's objectives and its flexibility in addressing the needs of community members, while identifying both program challenges and strengths. We gathered feedback from community members through informal conversations after each activity, which created a relaxed atmosphere and encouraged open discussions about their experiences and insights. The collaborative discussions with the program coordinators of the MFHC allowed us to co-define our research objectives, which are to describe how nutrition-related health programs - HBHCP, and the DPP respond to unique community needs and challenges surrounding food and nutrition, and to document the on-the-ground realities of program delivery, including operational challenges faced by these initiatives.

Project implementation and research: fieldwork phase 2

Stage 3 The third stage of fieldwork was conducted over a nine-day period in February 2025. This phase added another layer of understanding of the programs by continuing our involvement in program operations, gathering feedback from activity participants, and conducting in-depth interviews with the program coordinators and the community health coordinator. Working alongside coordinators revealed nuanced challenges in program implementation that might not be evident through observation alone. Following these activities, we facilitated informal conversations with community participants, which provided rich contextual insights that went beyond what formal evaluation tools could capture. These discussions described how community members perceive the value of the programs, the aspects that resonate most strongly with their lived experiences, and the barriers that affect their participation. A significant component of this stage involved conducting semi-structured interviews with both program coordinators and the community health coordinator. These interviews specifically explored the operational challenges faced within the programs, including funding constraints, resource limitations, and program delivery.

Stage 4 The fourth and final stage was conducted in May 2025. This phase integrated all our understanding of the programs and community member perspectives through comprehensive data collection. We conducted semi-structured interviews with community members to gather their perspectives and experiences with health programs offered in the community as well as identify what additional support they need to better improve program objectives and delivery. The participants had the option to participate online via phone calls and Zoom or in person during fieldwork in June. Five individuals opted for online interviews, while one participant chose to be interviewed in person. These interviews, combined with our direct participation in program delivery, observations, and community feedback, completed our methodological approach by triangulating perspectives from community members, Health Center staff, the Community Health Coordinator, and activity participants.

Methods

Recruitment of participants

Activity participant recruitment followed the research protocols previously established by our research team and the Moose Cree First Nation in 2018 [15]. The program coordinators of the HBHCP and DPP assisted in recruiting participants who are community members and are currently involved in or utilizing these programs. Recruitment was done informally through the MFHC Facebook page, where infographic posters were posted to inform the community about the upcoming activities at the Health Center. Interested individuals were invited to freely join and participate in these activities. Furthermore, the recruitment of the participants for the interviews was primarily through a call for participants publication on the MFHC Facebook page, and referrals from other participants.

Data collection

Learning by doing (also referred to as participant observation [15]), semi-structured interviews, and evaluation forms were useful data collection methods throughout the study to gain a comprehensive understanding of the

food-related challenges faced by community members and the current status of the health promotion programs. The details of these data collection tools are outlined below.

Learning by doing

Learning by doing is a primary and central method for knowledge-gathering in this study. This method is focused on gaining knowledge from one another through observation, listening, and sharing knowledge [55, 61]. It involved us working in collaboration with the program coordinators on planning, implementation, and program delivery. Our hands-on and firsthand involvement allowed us to truly understand the primary challenges and difficulties that the program coordinators face when conducting these activities. It also enabled us to immerse and engage directly with community members, fostering conversations on food and nutrition challenges and community needs. After learning by doing, we documented extensive and descriptive fieldnotes of what had occurred and discussed in the informal conversations, which supported a deeper interpretation of how community members understood and navigated specific experiences [62]. These observations and reflections also informed our interview questions and facilitated conversations with community members, which enhanced our understanding of local knowledge and practices.

Semi-structured interviews

The use of semi-structured interviews was to accompany participation and observation methods. Interview participants included two program coordinators and the community health coordinator (n = 3) (as service providers) to better understand and document their lived experiences on program delivery in the community. The interview guide included open-ended questions related to 1) the structural challenges affecting the programs and how these challenges are typically addressed, and 2) the strengths that contribute to their effectiveness in delivering nutrition knowledge. Separate interviews were conducted with community members (as service users) to 1) explore food-related challenges in the community, 2) their perspectives and experiences with existing support and programs offered by the Health Center, and 3) their identified needs and priorities for improving program delivery. The interview guide was developed through collaboration and consultation with community members to ensure that the questions were culturally relevant and respectful. Participants were recruited using a combination of convenience and snowball sampling. Community members were offered a $50 incentive. A total of six community members were interviewed, comprising both males (n = 1) and females (n = 5), aged 24–54. All interviews were conducted in conversational mode, acknowledging that a two-way conversation is a way of exchanging knowledge, and as many traditional teachings suggest, that meaningful learning occurs through shared conversations rather than a one-sided transmission of information from a single “expert, " which is contrary to Western research methods of conducting qualitative interviews [63]. The interviews were audio-recorded whenever possible; however, in cases where participants were not comfortable, we took extensive notes with the assistance of a co-researcher.

Participant feedback

An evaluation form was given to participants following each activity (e.g., baby-food preparation and gardening workshop) to collect immediate feedback. The evaluation forms were co-developed with the program coordinators, not only as part of the project, but also used and applied to the program activities. However, in some circumstances that community members expressed discomfort with evaluation forms and being mindful of not wanting to appear as we are “evaluating” them, we opted for informal verbal discussions about their experiences with the activity, emphasizing its value for them and their families, as well as exploring how the programs could further support their needs. This approach fostered a relaxed atmosphere that encouraged participants to share their insights. After each conversation, we promptly documented our reflections and key takeaways in fieldnotes. All project partners and community members were given the option to be identified or to remain anonymous in the paper. Those who wished to be identified provided written permission to have their name or photographic image used.

Data analysis

Learning by doing, semi-structured interviews, and participant feedback from the activity were useful methods throughout the fieldwork for collecting data. The field notes, meeting minutes, transcripts, and feedback forms were read and reviewed while abstracting meaningful data. A more nuanced thematic analysis (TA) was conducted and approached inductively, allowing themes to emerge from the interview dataset. This allows for identifying patterns and interpreting them both between interviews and between the interviews and field notes [64]. Notes from each interview were read extensively and coded into categories. Codes that pertain to the same general concept were grouped together to create organizing themes that enhance the meaning and significance of the narratives. Further rounds of coding was conducted to reexamine and reanalyze the previously created codes and categories to further develop into sub-themes. The initial coding was conducted by the researcher

Table 2 Interview participant characteristics

Characteristics	Community member (service users)	Health Center staff (Program coordinators and Community Health coordinator)
Sample size	6	3
Sex		
Female	5	3
Male	1	0
Age		
18–50	4	3
50 +	2	0
Self-identification		
Indigenous	6	3
Non-Indigenous	0	0
Marital status		
Married	4	3
Single (e.g. divorced, widowed)	2	0

Table 3 Overview of Nutrition-related health program activities

Diabetes Prevention Program	Healthy Babies Healthy Children Program
*Lunch and Learns	*Baby Food Preparation
*Food Demonstrations	Nutrition Bingo
*Gardening Workshop	Prenatal Classes
Meal Bags	Moss Bag and Receiving Blanket Making
Nutrition Bingo	Babysitting Course
*Community Kitchen: Cooking Workshop	Home Alone Safety for Kids
Harvester/Community Freezer	Potty Training
Health Awareness	Easter Activities (Snow Sculpture and Decorating)
Weight Loss Program	Walking Club
Preschool Clinic	Mosquito Hat Making
Summer Soccer Program	Halloween Home Decorating
Hobby Hub	Family Literacy Week
Children/Family Home Kits	
Making Flower Arrangements for Grieving Community Members	
Winter Activities	
Yahtzee Walks	
Gym Nights	

and subsequently discussed with program coordinators to ensure accuracy and resonance with community perspectives.

Results

Three Health Center staff, including two of the program coordinators and the community health coordinator, and six community members were interviewed throughout the project. The observations and informal conversations with participants during our firsthand participation in program delivery and implementation of activities were also included in the analysis, providing contextual insights into program operations and community dynamics. The interview participants were predominantly members of the Moose Cree First Nation, with the exception of three who lived in Moose Factory but were affiliated with different First Nations. The sample represented a diverse range of socioeconomic backgrounds, from economically advantaged to economically disadvantaged groups. Participants varied in their sex, age, and marital status as shown in Table 2.

The integrated analysis of the interview data, combined with observational data and informal conversations, revealed key findings across three domains, which are presented in the sections that follow: (1) description of nutrition-related health program activity implementation and delivery; (2) why these health programs matter; and (3) what support these programs need. The first domain describes how nutrition-related health programs respond to the immediate needs of the community through various activities. The second domain presents insights from interviews and participant feedback, highlighting the value of health programs within the community context. Finally, the third domain outlines the systemic challenges to program delivery, underscoring community-identified needs and priorities for strengthening health programming.

Nutrition-related health programs

MFHC operates two primary health programs that aim to address health, nutrition, and wellness needs across different age groups in the community. While the DPP and HBHCP offer numerous activities (as outlined in Table 3), this paper specifically focuses on food and nutrition-related activities where we had firsthand participation in program implementation and delivery. This section provides an overview of how their nutrition-focused activities are delivered in the community, and the following section explores their broader significance in supporting community health and wellbeing in Moose Factory.

Diabetes prevention program

I. *Lunch and Learns.*

Lunch and Learn sessions represent a significant community engagement strategy within the health programs at MFHC, typically conducted monthly as an interactive platform for community members to gather over a meal while exchanging knowledge on health, nutrition, and wellness. Due to pandemic constraints, this activity had not been implemented since COVID until the reintroduction of the activity during our fieldwork. This session aimed to address the community's strong interest in strengthening knowledge on reading food labels

and making informed decisions on grocery shopping, which are crucial given the challenges of food accessibility and affordability in Moose Factory. The planning process focused on selecting a recipe that was nutritious, cost-effective, and feasible for a family or group setting. During fieldwork in September in 2024, we shared in the organizing and delivery of one of the Lunch and Learns. Working with the Diabetes Prevention Coordinator, we prepared a chicken rice casserole as it met the above criteria and allowed for flexibility in sourcing ingredients. Prior to the session, we conducted a comprehensive scan at the Northern Store to assess ingredient availability and identified price disparities among similar items that could serve as substitutes for one another. These observations were shared with participants to inform them on the practical comparison of selecting ingredients based on price and nutritional value. Participants learned to identify cost-effective substitutions, such as selecting 4 pieces of sausages ($8.00) over 1 kg of ground pork ($8.50) for comparable recipes. Additionally, they learned to weigh convenience alongside cost considerations. For instance, choosing a small pre-shredded cabbage-and-carrot pack over a whole cabbage when both items were priced similarly, since the pre-shredded option reduced preparation time, provided additional vegetable variety, and maintained equivalent nutritional value. The activity was held at the MFHC office and was attended by 16 participants, primarily those with families, which the program coordinator noted was higher than typical attendance compared to other similar activities. We began with a discussion about the chicken rice casserole recipe, sharing insights gained during the ingredient selection. A key component focused on interpreting nutrition labels, with a demonstration of understanding serving sizes, nutritional content, and ingredient lists. During the session, most participants acknowledged rarely reading food labels, with shopping decisions typically influenced by price and availability of staples. Participants expressed surprise at cost discrepancies between similar products and appreciated practical tips for affordable meal preparation. Discussions expanded to broader community food challenges, including price inflation and poor produce quality at the Northern Store, providing valuable insights into barriers to healthy eating.

II. *Food Demonstration.*

Over the course of the fieldwork, we conducted two demonstrations at the Health Center entrance using a sample station booth where community members could freely participate. Objectives included showcasing affordable, diabetes-friendly recipes; highlighting practical home preparation techniques; explaining nutritional benefits; and demonstrating versatile uses of locally available vegetables. This activity also demonstrates creative recipes utilizing ingredients that are readily available from the grocery store and grown on the island. Our first demonstration engaged 25 participants and featured different preparations of canned legumes (chickpeas, red kidney beans, and black beans), transformed into Thai Coconut Chickpea, Tex-Mex Bean Salad, and Yellow Thai Chickpea Curry. Meanwhile, the second demonstration engaged 32 participants and showcased vegetable recipes that are readily available from the grocery store and grown on the island (butternut squash, spinach, mushroom, and rutabaga). These vegetables were cooked into Roasted Butternut Squash Parmesan, Cheesy Spinach & Mushroom Casserole, and Mashed Rutabaga with Sour Cream and Dill. Our firsthand participation in implementing the activity demonstrated that enhanced educational environments led to increased community engagement. For example, during the second food demonstration, visual displays of the community garden, nutrition education posters highlighting traditional foods with nutritional content, and take-home materials (placemats, refrigerator magnets, and coasters) reinforcing nutritional messaging generated notably higher participation compared to the first demonstration, where such materials were not utilized. Moreover, participants showed particular interest in maximizing the use of locally available vegetables, with several requesting recipe cards. Community responses revealed mixed perspectives toward healthy eating, with some expressing genuine interest in nutritionally balanced recipes and requesting materials to try at home, while others shared challenges, including time and energy constraints for food preparation, difficulty breaking established eating habits, and desire to reduce fast food consumption.

III. *Community Kitchen Cooking Workshop.*

The Community Kitchen Cooking Workshop was designed as a hands-on educational experience designed to demonstrate preparation of accessible, affordable, and nutritious meals for families. Recognizing the importance of accessibility, the recipes were carefully selected to use budget-friendly ingredients and simple cooking techniques, ensuring they could be replicated at home by participants. The workshop was structured to accommodate four families with the goal of fostering family engagement in meal preparation to strengthen family dynamics around food. Due to the program lacking dedicated facilities, a kitchen space was rented specifically for this activity to provide an interactive environment where families could learn and practice cooking skills together. However, due to an unexpected water shortage in the community, the cooking workshop had to be canceled. In response, the program coordinator adapted the

initiative to still achieve its objectives. The team prepared the planned meals ourselves, following the same recipes originally selected for participant families. The Diabetes Prevention Coordinator used Facebook to disseminate information to the community that prepared meals and printed recipe cards were available for pickup. This adaptation maintained the nutritional education component in modified form while responding to immediate community circumstances. Community members were able to receive the cooked meals and receive preparation instructions. This situation highlighted both the vulnerability of programming to infrastructure challenges in remote communities and the importance of flexibility in program implementation. The program coordinator's adaptation demonstrated how community health initiatives can maintain their core objectives even when faced with unexpected barriers, ensuring that resources allocated to community nutrition are utilized effectively regardless of circumstances.

IV. *Gardening Workshop.*

Our group has been supporting local food development and sustainability initiatives, including community gardening, since 2019 [15, 37, 38]. These initiatives have emerged as a community-centered response to the food security challenges previously identified. The objectives of the workshop were to develop self-sufficiency skills in food production, to teach sustainable growing techniques adapted to the local environment, to introduce composting practices, and to build capacity for constructing garden boxes. Participants represented diverse age demographics, predominantly including individuals with little to moderate gardening experience. The first workshop was attended by 16 participants, and due to community interest exceeding our initial capacity, we conducted an additional workshop session attended by 4 participants. The first session was led by a local community member who has a horticulture background and experience in growing food on the island, thereby leveraging contextually relevant expertise. The workshop incorporated multiple learning modalities, including tactile seedling planting demonstrations, distribution of comprehensive garden starter kits, and facilitated discussions about garden establishment and maintenance within the specific environmental constraints in the community. A beginner-friendly gardening booklet was developed featuring step-by-step visual and textual instructions for garden establishment, seed planting, and maintenance, which were distributed to the participants, who reported that these materials were particularly helpful because they were straightforward and less intimidating for beginners. Participants perceived gardening initiatives as crucial for improving fresh produce access while mitigating escalating food prices. Multiple dimensions of value were identified beyond food access, including connections to food sovereignty, intergenerational knowledge transfer, and enhanced self-efficacy. Furthermore, they described the importance of obtaining food from the land, whether through gardening and hunting, as these honor traditional practices.

> *"Having some control of where our family food comes from, from getting my children interested in the process of growing food and making healthier choices, and cost of food has increased so much" - Activity Participant 1.*
> *"To teach our grandkids that food comes from the land." -Activity Participant 2.*

The sustainability aspect of these gardens was particularly salient, with several participants noting that harvests provided food security extending through winter months. Some cite their interest in participating in the workshop as *"Work towards food security"* and *"I want to be self-sufficient."* Community members value having control over their food sources and knowledge of how their food is grown. However, it is important to note that according to studies done by Skinner et al. [17] and Thompson et al. [65] in other northern Indigenous community garden contexts, the garden yields are more steps towards food sovereignty rather than a comprehensive solution to household food insecurity. Ultimately, these workshops strengthened community self-efficacy and resilience, contributing to broader efforts toward food sovereignty and sustainability.

Healthy Babies, healthy children program

XXII. *Baby food-making preparation (complementary food).*

The HBHCP in Moose Factory is the only program in the community that offers prenatal classes to mothers and parents. This activity aims to address concerns about the affordability and quality of store-bought baby food while promoting healthier alternatives. The primary objective of the baby food-making activity is to demonstrate and teach parents how to prepare their baby's first complementary food, starting at six months of age. Additionally, the activity emphasizes the importance of mealtimes as an opportunity for bonding between parents and their children. During the activity, the program coordinator explained and demonstrated the use of a NutriBullet©, a compact and efficient blender designed for preparing small portions of food. Store-bought complementary food samples were also provided for comparison, allowing participants to distinguish the differences in

taste, texture, and nutritional value between homemade and commercially produced baby food. The activity was attended by two couples, both first-time and early-stage parents, who expressed keen interest in learning how to prepare homemade complementary foods for their future babies. Participants, especially first-time mothers, appreciated the program's support in building their confidence and understanding of what goes into their babies' food, while also noting that it was the only program in the community offering prenatal classes, making it significantly beneficial for them.

> *"The support from the Health Center is comforting for new moms. The classes are super helpful. Knowing my baby will be eating healthy gives me ease" -Activity Participant 1.*
> *"This is the only program that has prenatal classes, and it is really helpful, especially for first-time moms," – Activity Participant 2.*

Why these health programs matter?

Insights from our conversations and interviews with community members, program coordinators, and the community health coordinator demonstrated a strong understanding of what constitutes a healthful eating, describing it as a balanced and varied intake of all food groups like vegetables, whole grains, wild meats, and other foods sourced from the land. However, community responses also reflected mixed perspectives in applying this knowledge, as they are constrained by proximal and intermediate determinants of health. This includes the rural, remote location of the community, resulting in high food prices, limited availability of fresh and nutritious food options, and the poor quality of store-bought products due to transportation and resources needed to bring supplies in the community [12, 66–68]. It is within this context that health programs emerge as particularly valuable community resources, serving as frontline responders to these barriers and immediate community needs. Drawing from community voices and lived experiences, the following section shows three interconnected dimensions of program value in the community.

Health programs as family and community support systems

Activities encourage family participation, embedding nutrition education within family dynamics while strengthening knowledge and relationships around food and nutrition. This approach leverages family structures as powerful vehicles for information dissemination and sustainable behavior change [69]. Community members emphasized the importance of family-oriented programming that builds both family capacity and parental capacity through collaborative activities with their children. For example, the community kitchen cooking workshop, where families prepare meals together with children actively involved in the cooking process, integrates educational components into family interactions. Participants highlighted the importance of creative educational approaches, like food demonstrations and nutrition bingo, used to share knowledge and engage children while ensuring that each activity fosters participant learning. They emphasized the importance of involving their children in community activities as a way to cultivate a sense of belonging at a young age within the community. Beyond family strengthening, the programs provide spaces for communities to support one another. Participants were motivated by the opportunity to find mutual support with like-minded community members through the programs. Furthermore, food sharing represents a central component of program activities, serving as both a culturally important practice and an effective engagement strategy for health programming that encourages participation and conversations. Gathering around food, like *Lunch and Learns*, provides spaces for collective learning and strengthens social bonds between families and communities, facilitates meaningful discussions around food and nutrition challenges within the community, and ultimately inter-connects the people, the land, and the culture [70, 71]. Community members also recognized that the programs contribute to community wellbeing by providing immediate support on identified challenges, which helps reduce family stress and potential negative behaviors that might result from unmet basic needs.

> *"It's geared to build the family's capacity and the parents' capacity to do things for their family. Like, doing things together, having a family kitchen where, they cook meals together, getting the kids involved, and doing teachings in that way." -Interview Participant 3.*
> *"I think for some people, like if those programs didn't exist, it would be a net negative for our community. I think even apart from all of the programming they do and things like that, just bringing resources into the community Like if those resources weren't here, then the family that they go to just simply wouldn't have them… And so I think that benefits me as a community member because it allows for less hungry families, which allows for less upset families who might do things that they wouldn't normally do."- Interview Participant 2.*

Health programs as frontline responders to immediate community needs

On high food cost A key strength of the health programs lies in how their activities are directly informed by the community's lived challenges. High food cost is a common challenge consistently cited by community members and Health Center staff, with local members describing food prices in Moose Factory as much higher than in southern urban areas like Ottawa. The high prices of food led some community members to purchase groceries from southern locations like Cochrane, Sudbury, and Timmins, even with added shipping fees, as this ultimately provides more and varied food options at a lower total cost. Meanwhile, others utilized trips to southern cities for medical appointments or family activities as opportunities to purchase food items in bulk at reduced prices.

> *"I hardly buy meat here at the Northern because it's so expensive, like wings that size …. is like almost $30 and then when I go out of town, like Timmins for appointments, I'll buy groceries." - Interview Participant 4.*
> *"It's a lot easier to meal plan when ordering from Cochrane because you have many other options available as well. I would say that it saved us money for sure…The groceries would last, I would say, the week, and like we're paying probably like $300.00 for groceries from Cochrane. But if we went to the Northern grocery store every day, which is how we were doing it for a while, it would cost more." -Interview Participant 1.*

The Community Health Coordinator also echoed that food remains a fundamental need in the community, acknowledging the increased interest in healthy eating among community members. However, many remain constrained by high food costs that limit their ability to choose healthier options. For example, interview participants from economically disadvantaged backgrounds prioritized price over other factors, such as availability, nutritional value, preferences, and dietary needs, when purchasing food. In contrast, participants from more advantaged socioeconomic backgrounds considered factors like nutritional value and preferences before the cost of food. The HBHC program coordinator also expressed similar concerns about high food prices affecting families and highlighted worries about the unclear ingredients and manufacturing processes used in commercial baby food. Stemming from this problem, the HBHC program coordinator frequently conducts baby food preparation workshops that teach first-time and early mothers to prepare homemade alternatives, such as fruit purees, addressing concerns about the affordability and quality of store-bought baby food.

> *"The food, that need. I've seen changes in how people eat. A lot of people want to be healthy. So, I have seen that, and there's not enough focus on that. We're still kind of stuck in the negative." - Community Health Coordinator.*
> *"Food is pricey here, and we are not entirely sure of what goes into the processing of baby food, so I just thought of making baby food healthy meals" - Codie O' Connor, HBHC program coordinator.*

Recognizing these economic challenges among community members, the provision of tangible incentives and giveaways in health programs not only encourages participation and engagement but also alleviates immediate financial barriers for economically vulnerable families. For example, a significant aspect of the HBHC program is the provision of giveaways, such as NutriBullet© blenders. These giveaways not only support parents financially but also encourage involvement in the activity. Moreover, two interview participants from disadvantaged socioeconomic backgrounds specifically mentioned that complementary items such as gift cards, incentives, and grocery supplies are their primary motivation for attending activities, noting that these resources provide substantial benefits for their households. While the programs neither eliminate food insecurity nor fully resolve access issues, they play an important role in alleviating the burden these challenges place on individuals and families.

> *"I was more inclined to participate because of the support aspect of it; having the program offer the blenders themselves was extremely helpful and encouraged me to be more curious without worrying about the financial aspects involved on my end."- Activity Participant 3.*
> *"Well, we appreciate getting free stuff. They do have gift cards, groceries, or prizes… it helps with maybe even like two weeks' worth of groceries. It helps." -Interview Participant 4.*
> *"I think it's taking advantage of what's being offered and being able to share those things with my kids and family. And I really want my kids to be engaged in the community and be part of it and to feel that sense of belonging. If I'm doing that, I'm role modeling that for them and they'll be willing to do that as well." – Interview Participant.*

On limited food access and food availability The community relies heavily on three primary market food options: the Northern Store, a smaller locally owned

store, and a farmers' market that visits the community twice a month [15]. Fresh produce availability is severely limited, with food items frequently expiring or spoiling upon arrival. It was observed that shelves in the grocery store are mostly empty by mid-week, resulting in supply shortages of essential items throughout the week.

> *"I think its availability, like you can go to the store with a plan most of the times and that plan kinda falls through just based off of what's available at the store. Like, sometimes you'll be missing one or two ingredients, and then you kinda just have to think of a recipe on the spot or whatever it may be. So, I think availability is the biggest thing." – Interview Participant 1.*

Community members reported prioritizing the purchase of items like bread and milk immediately when new stock arrives, as these products typically sell out first and remain unavailable among other food items until the next scheduled delivery. The unpredictable availability of preferred food items disrupts meal planning, requiring community members to work with the ingredients available at the store. Most participants expressed the need for improved access to fresh meat, fruits, and vegetables. The subarctic climate and environmental conditions further compound food availability challenges by making local produce cultivation difficult and seasonal, thereby restricting fresh produce all year round. However, participants cited how the local food sustainability initiatives, such as community gardens [15], provided relief by offering food access to fresh vegetables and herbs while reducing their reliance on expensive store-bought produce. People especially valued the sustainability aspect, with some participants highlighting how harvests contributed to food access and availability that extended into the winter months. One participant shared avoiding store purchases except for basic staples, instead relying on foods they grow, hunt, and fish—including moose, caribou, geese, and fish—which sustain their family year-round. They explained that growing and hunting food "*is what makes them who they are"* and gives them a deep connection to the land. They emphasized that their family actively works toward food sovereignty by defining healthy eating as the consumption of traditional foods harvested from the land.

The DPP acknowledges these challenges in the community and respond to them through activities like food demonstrations, where participants learn to maximize available ingredients from the grocery store and locally grown produce into creative, diabetes-friendly, and healthy recipes and community cooking workshops, where families gain hands-on experience preparing affordable meals using budget-friendly ingredients from the store that they can replicate at home.

Health programs as tools for fostering self-sufficiency The programs utilize nutrition education in culturally grounded approaches, equipping community members with the knowledge and practical skills to support informed food choices and food resource management, fostering greater self-sufficiency, and promoting long-term health and well-being. Community members described the importance of educational support that programs provide through knowledge sharing and learning of skills like grocery shopping skills, growing their own food, and skills to prepare food with limited resources. Several participants noted the significance of having programs that promote healthy behaviors, including healthy eating, diabetes management, and physical activity, particularly in a community that has experienced trauma, dysfunction, and health challenges.

> *"I think the fact that there's a constant program that's always promoting, like, health, like being healthy. I think that's so important in a community where there's been so much trauma and dysfunction and sickness… the Health Center and the work they do in constantly promoting health whether it's eating healthy or taking care of your health or being active like I think that's so key and I think it needs to be stronger." – Interview Participant 3.*

What supports are needed by the health programs?

This section explores community-identified needs and priorities that highlight broader systemic barriers affecting the delivery, reach, and sustainability of health programs in Moose Factory. These challenges have been compounded by the lasting impacts of COVID-19, which disrupted operations and exposed vulnerabilities in the existing system. The pandemic not only halted services, activities, and support during heightened need but also held back the momentum and community engagement that had been built over the years. Moving forward, rebuilding these programs has required significant effort as coordinators work to re-establish trust, re-engage participants, and adapt to the evolving needs of the community. The current rebuilding efforts, including the recent appointment of the HBHC program coordinator in May 2023 to rebuild a program that had been inactive during the pandemic, create additional challenges alongside existing systemic barriers. Through direct involvement in the implementation and observation of nutrition-related activities, we gained further understanding of the operational realities of program delivery influenced by systemic challenges. These observations were corroborated through interviews with the program coordinators and

the community health coordinator. Community members also shared insights for improving health programming, particularly in supporting vulnerable populations, enhancing accessibility, and expanding the scope of the activities.

Funding.

Program coordinators consistently cited that existing funding frameworks are unsustainable, insufficient, and often delayed. This creates situations where health programs struggle to maintain consistent service delivery, engage in long-term planning, or develop comprehensive responses to community health needs. For example, the MFHC Food Bank program experiences frequent service interruptions as operations of the food bank are suspended whenever funding is unavailable or delayed. With this, the DPP coordinator has resorted to applying for external grants to address funding limitations. This grant-writing process adds a significant administrative burden and becomes counterproductive, diverting time and energy away from service delivery and toward funding procurement. While external funding sources, such as Jordan's Principle, have been leveraged to address urgent community needs, particularly in food security initiatives, program coordinators express concerns about the sustainability of these funding streams, as they are not guaranteed. Moreover, the census-based funding allocation is identified as particularly problematic as the system allocates funding based solely on Indigenous people living on reserve who have completed the census, rather than accounting for status or the actual population requiring services. The disconnection between this funding system and the actual service population creates resource gaps. This results in an unsustainable pattern of "on and off-funding" for the health programs. The Community Health Coordinator noted that these budgetary constraints impede organizational capacity for growth and program expansion. Addressing these challenges requires reevaluating funding allocation to ensure it aligns with the actual needs and realities of the communities being served.

> *"Diabetes prevention program is ISC [Indigenous Services Canada] funding, and it's minimal. So, like, the money we get is only covering salary. We don't get much. We have to find our own money to do any programming. So far, our Diabetes Prevention Coordinator's job is probably, like, just simply getting funding to keep trying to make things work. So there's no expansion." - Community Health Coordinator.*

Staff and Resources.

The issue of funding in health services creates a complex web of challenges that extends far beyond mere financial constraints. This underfunding results in limited staff and inadequate resources, with both programs managed by a single coordinator, which places a significant burden on individual coordinators. The resulting workload may become overwhelming, leading to psychological distress, fatigue, and negatively affecting the overall quality of service and their well-being [72]. Furthermore, the absence of basic infrastructure, such as a functional kitchen space or adequate cooking equipment, restricts the capacity to conduct hands-on nutrition activities. The need to rent external spaces for activities like cooking workshops also adds an additional financial burden to programs. Program coordinators shared that a dedicated, well-equipped kitchen space would enable more food and nutrition activities and skills-building activities, facilitate hands-on community kitchens, and create more opportunities for community engagement. As Trickett [73] emphasizes, communities need adequate resources to adapt, innovate, and engage individuals in processes of change that improve community health.

> *"I would say that I want to do more hands-on activities, but it's hard for us. See how hard it is just to have a food demo? Looking for the proper things to use, looking for a stove, [it's just] I wish we had a stove. I wish we had many stoves." -Cynthia Kapashesit, DPP program coordinator.*

Needs and Priorities of Community Members.

Participants highlighted the need for additional support targeting vulnerable populations, particularly individuals with disabilities who rely on social assistance. One participant noted that while programs exist for families with young children (under six and seniors over 60), there is insufficient support specifically for individuals who have physical and mental disabilities, which prevent them from working, maintaining self-care, and performing daily activities independently. These limitations make it difficult to access basic necessities like food after covering essential expenses, as their monthly government assistance is insufficient to meet their needs throughout the month. Participants recommended expanding workshop topics beyond current offerings to avoid repetition and increase engagement. They suggested more information on traditional foods with programming targeted toward younger generations to preserve cultural food knowledge while making it accessible to diverse audiences. Moreover, participants gave ideas on workshop topics based on their practical needs: leftover recipe transformation techniques, child-friendly healthy recipe development, meal preparation and planning strategies, and traditional food preparation methods, including food safety protocols and fish filleting techniques. One participant also suggested that programs should provide more support for land-based activities, particularly

supporting community gardening initiatives. They emphasized that this would serve a crucial function for the community, not only improving food access but also promoting holistic health benefits - mental, physical, and emotional well-being. Additionally, participants emphasized the importance of utilizing social media platforms more extensively for program promotion and information dissemination, recognizing these channels as primary sources of information access for many community members.

> *"I'm on ODSP [Ontario Disability Support Program], my husband and I, but we don't get that much. We only get like $1,700 a month, but still we pay our bills and then we still run out of groceries... And then there's no program for people like me in my age category, like 50 to 60. But you'll have programs for mothers who have children six and under. And then they'll have programs for people that are 60 and over. But still, there's no programs for somebody like me that still struggles." - Interview Participant 4.*

Discussion

This study offers a participatory perspective on how health programs in remote northern Indigenous communities are delivered and experienced, particularly in the context of ongoing colonial legacies, food insecurity, fragmented health governance, and impacts of COVID-19. While previous studies have identified challenges in health systems and health services in remote, northern Indigenous communities, these studies have largely relied on interviews, sharing stories, and literature reviews [26, 29, 30]. In contrast, this research engages directly in program delivery and is implemented alongside the MFHC program coordinators, providing a detailed account of how activities are carried out to address drivers of food insecurity in the community and offering lived understanding into the extent of systemic challenges faced by health programs. This collaborative work with MFHC better understands the significance of health programs and identifies further needs that reflect the community's priorities, capabilities, and capacity.

High food costs, which limit access to healthful foods, a limited availability of desired food items in local stores, and the generally low quality of fruits and vegetables are consistently identified as drivers of food insecurity in the community. From our observations, these challenges are not unique to MCFN, as they are well documented in the literature on food insecurity in remote, northern Indigenous communities [8, 12, 13, 74]. While most of the initiatives documented to address food insecurity were focused on local food development, food banks, and food programs, which are also present in the community, these initiatives primarily aim to increase food access and reduce cost barriers [10, 15, 17, 38, 75]. This study demonstrates the crucial role of culturally relevant nutrition education and hands-on workshops in supporting families in food selection and preparation, building nutrition knowledge, and enhancing resource management skills, thereby enabling them to make informed decisions and improve health outcomes. Similar to programs conducted in other Indigenous communities, cooking workshops, in-store food demonstration, and nutrition education activities demonstrated increased consumption of healthful foods, improved food-related behavior, and increased self-efficacy [19, 76]. Although the present study does not investigate food consumption and food-related behavior, this may suggest that similar culturally appropriate nutrition education activities may be effective in promoting healthy eating behaviors. Studies support that nutrition education is a valuable component in building nutrition knowledge and skills, which is a crucial factor in addressing food insecurity among remote, Indigenous communities [77]. However, it is important to understand that nutrition education alone cannot improve food insecurity [78] but it should be integrated among other initiatives targeting food availability, food cost, food safety, and food quality [77, 79]. This study contributes to the limited literature in remote, northern indigenous First Nation communities by offering community-based insights on how nutrition education serves as an additional support in addressing food insecurity in these contexts.

Furthermore, conversations with community members also highlight the importance of providing flexible nutrition education that meets people at different stages of readiness for change, offering regular activities and accessible information while respecting individual pace and understanding. In communities where there has been intergenerational trauma, the adoption of unhealthy coping behaviors has become entrenched due to the lasting impacts of colonialism [80]; tailored approaches to an individual's stage of readiness and constant support are especially important in overcoming the complex barriers to behavior change [81]. However, these outcomes require sustained community engagement, empowerment, and consistent efforts to deliver programs, which necessitate adequate and long-term funding, along with dedicated resources to ensure program continuity and effectiveness [82, 83]. Like many northern remote communities, MCFN faces challenges with inadequate infrastructure, insufficient funding, and limited human resources, which were also identified as barriers that limit program sustainability [26, 84, 85]. Our firsthand participation in program delivery informed the extent of these challenges in the community, where inadequate infrastructure necessitates the rental of kitchen spaces and the constant search for appropriate spaces to conduct

programs. Insufficient funding compels program coordinators to apply for external grants to maintain operations, and the limited staff not only means a shortage of health professionals in the community but also leaves a single coordinator to manage responsibilities typically handled by a larger team. In many cases, Jordan's Principle funding fills gaps to keep programs operational, mirroring experiences in other First Nation communities [86].

Importantly, health programs in MCFN serve as the first point of contact for families seeking support and frontline responders to immediate, non-clinical needs. While health services in northern communities are primarily delivered through nursing stations or health clinics [34], limited resources and a predominant focus on acute care have resulted in inconsistent access to health promotion and preventive programs. Some communities lack these programs entirely, while others only offer them occasionally [29, 87]. These findings underscore the importance of strengthening and prioritizing sustained support in community-based health programs, not only as vehicles for preventive care but also as essential, culturally grounded support systems that respond to the everyday realities and needs of Indigenous families in remote settings. Like other Indigenous health research, Indigenous-led health services and programs often extend beyond formal objectives and adapt to family needs to offer holistic care that meets not only physical needs but also emotional support, social connection, and family advocacy, positioning them as crucial anchors of community well-being [40, 83, 86].

Ultimately, this study points out the broader role of governance systems in shaping program delivery and outcomes. Federal and provincial jurisdictions must improve collaboration, communication, and coordination with each other regarding First Nations health for better alignment of policies and services that would support more equitable resource distribution, reduce service duplication, and allow efficient funding allocation [27, 88]. The HTP funding agreement is insufficient to meet actual community needs and is bound by funding mandates that restrict data sharing and collaboration with other health services due to confidentiality requirements. This creates isolated service silos that prevent the continuity of care and holistic care delivery to people. Again, the conceptualization of health and wellness for First Nations communities is not solely the absence of disease, but a holistic concept deeply rooted in relationships with the land, family, culture, and community [89, 90]. As such, health policies must reflect the cultural concepts, social conditions, traditional practices, needs, and priorities of the communities they aim to serve, and health strategies must adopt frameworks that are flexible, culturally grounded, and informed by the definitions of 'health' held by each community [91, 92]. Indigenous communities must be positioned at the center of health system governance and decision-making processes. This includes developing partnerships that respect and include Indigenous communities over program design, delivery, implementation, and evaluation as well as providing sustainable funding for a wholistic Indigenous-led programs. By shifting decision-making power to Indigenous communities and resourcing them adequately, health systems are better equipped to respond to distinct determinants of health, promote culturally meaningful wellness, and address long-standing inequities in a manner that is effective, respectful, and aligned with the principles of reconciliation and self-determination.

Conclusion

This study emphasizes the importance of adopting a strength-based approach that builds on the capabilities, resilience, and strengths of the community to create an inclusive and empowering framework that resonates with the community it serves. Indigenous-led health programs are vital in equipping individuals and families with knowledge, skills, and culturally grounded opportunities for healthier living; however, they alone cannot resolve the systemic challenges driving food insecurity. Addressing issues such as high food costs, limited access, and poor food quality—both in Moose Factory and in other northern, remote Indigenous communities—requires structural change from governing bodies. This includes shifting from top-down models to community-informed policies, where governments act as supporters rather than drivers. Sustainable solutions must center Indigenous-led governance and uphold the autonomy of communities to manage their own resources and lead their own health and food systems.

To this end, ISC should re-evaluate its funding models and requirements to better align with community needs and priorities that are informed by community realities. Future funding agreements should support integrated service delivery by encouraging collaboration on the ground and case coordination for a holistic approach to health care delivery in communities. Furthermore, this study highlights the importance for researchers to meaningfully engage with communities through community-based participatory research (CBPR) approaches, which allow for in-depth understanding of one's situation, support co-learning, and ensure that knowledge generated is relevant, respectful, and rooted in their priorities. This is essential for developing responsive, sustainable, and equitable policies and strategies.

Acknowledgements

We would like to acknowledge Moose Cree First Nation for their support and contributions throughout the project. In particular, we would like to thank Codie O'Connor, Program Coordinator of the Healthy Babies, Healthy

Children Program; Cynthia Kapashesit, Program Coordinator of the Diabetes Prevention Program; and Christina Linklater, Community Health Coordinator at the Moose Factory Health Centre. Their guidance, knowledge, and insights were invaluable in shaping this research. The contributions and perspectives they provided are reflected throughout this article and were essential to its development.

Author contributions
All authors contributed in the development of article. TB drafted the initial manuscript, and MR provided feedback and comments. All authors finalized the final version.

Funding
Funding for the study is provided by the Social Sciences and Humanities Research Council of Canada.

Data availability
The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
The implementation of the study was in accordance with the University of Ottawa Research Ethics Board.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

Author details
[1]Faculty of Health Sciences, School of Nutrition Sciences, University of Ottawa, Ottawa, ON, Canada
[2]Faculty of Health Sciences, School of Human Kinetics, University of Ottawa, Ottawa, ON, Canada

Received: 26 August 2025 / Accepted: 9 December 2025
Published online: 27 December 2025

References

1. Halseth R. The prevalence of type 2 diabetes among first nations and considerations for prevention. Prince George, BC: National Collaborating Centre for Aboriginal Health; 2019.
2. Alabi BO, Robin T. Food insecurities and dependencies: Indigenous food responses to COVID-19. AlterNative. 2022;19(1):204. https://doi.org/10.1177/11771801221137639.
3. Levkoe CZ, McLaughlin J, Strutt C. Mobilizing networks and relationships through Indigenous food sovereignty: the Indigenous food circle's response to the COVID-19 pandemic in Northwestern Ontario. Front Commun. 2021;6:672458. https://doi.org/10.3389/fcomm.2021.672458.
4. Krieger N. Theories for social epidemiology in the 21st century: an ecosocial perspective. Int J Epidemiol. 2001;30(4):668–77. https://doi.org/10.1093/ije/30.4.668.
5. Berkest F, Farkas CS. Eastern James Bay Cree indians: changing patterns of wild food use and nutrition. Ecol Food Nutr. 1978;7(3):155–72. https://doi.org/10.1080/03670244.1978.9990526.
6. Krech IIIS. The Subarctic Fur Trade: Native social and economic adaptations. 1984.
7. Liebow E, Trudeau J. A preliminary study of acculturation among the Cree Indians of Winisk. Ont Arct. 1962;15(3):190–204. https://doi.org/10.14430/arctic3573.
8. Skinner K, Hanning RM, Desjardins E, Tsuji LJS. Giving voice to food insecurity in a remote Indigenous community in subarctic Ontario, Canada: Traditional ways, ways to cope, ways forward. BMC Public Health. 2013;13:427. https://doi.org/10.1186/1471-2458-13-427.
9. Taylor JG. Northern Ojibwa communities of the contact-traditional period. Anthropol. 1972;14(1):19–52. https://doi.org/10.2307/25604861.
10. Robidoux M, Mason CW. A land not forgotten: Indigenous food security and land-based practices in Northern Ontario. Can J Native Stud. 2017;38(2):221.
11. Kenny TA, Little M, Lemieux T, Griffin PJ, Wesche SD, Ota Y, et al. The retail food sector and Indigenous Peoples in high-income countries: a systematic scoping review. Int J Environ Res Public Health. 2020;17(23):8818. https://doi.org/10.3390/ijerph17238818.
12. Leblanc-Laurendeau O. Food insecurity in Northern Canada: An overview. 2020.
13. Huet C, Rosol R, Egeland GM. The prevalence of food insecurity is high and the diet quality poor in Inuit communities. J Nutr. 2012;142(3):541–7. https://doi.org/10.3945/jn.111.149278.
14. Willows ND, Veugelers P, Raine K, Kuhle S. Prevalence and sociodemographic risk factors related to household food security in aboriginal peoples in Canada. Public Health Nutr. 2009;12(8):1150–6. https://doi.org/10.1017/S1368980008004345.
15. Ferreira C, Gaudet JC, Chum A, Robidoux MA. Local food development in the moose Cree first nation: taking steps to build local food sustainability. Food Cult Soc. 2022;25(3):561–80. https://doi.org/10.1080/15528014.2021.1913557.
16. Herrmann TM, Loring PA, Fleming T, Thompson S, Lamalice A, Macé M et al. Community-led initiatives as innovative responses: Shaping the future of food security and food sovereignty in Canada. In: Food Security in the High North. 2020. pp. 249–80. https://doi.org/10.4324/9781003057758-14
17. Skinner K, Hanning RM, Metatawabin J, Tsuji LJS. Implementation of a community greenhouse in a remote, sub-Arctic First Nations community in Ontario, Canada: a descriptive case study. Rural Remote Health. 2014;14(2):2545. https://doi.org/10.22605/RRH2545.
18. Kenny TA, MacLean J, Gale P, Keats S, Chan HM, Wesche SD. Linking health and the environment through education—a traditional food program in Inuvik, Western Canadian Arctic. J Hunger Environ Nutr. 2018;13(3):429–32. https://doi.org/10.1080/19320248.2017.1420330.
19. Kolahdooz F, Pakseresht M, Mead E, Beck L, Corriveau A, Sharma S. Impact of the healthy foods North nutrition intervention program on Inuit and Inuvialuit food consumption and preparation methods in Canadian Arctic communities. Nutr J. 2014;13:68. https://doi.org/10.1186/1475-2891-13-68.
20. Pakseresht M, Kolahdooz F, Gittelsohn J, Roache C, Corriveau A, Sharma S. Improving vitamin A and D intake among Inuit and Inuvialuit in Arctic Canada: evidence from the healthy foods North study. J Epidemiol Community Health. 2015;69(5):453–9. https://doi.org/10.1136/jech-2014-204623.
21. Downer S, Berkowitz SA, Harlan TS, Olstad DL, Mozaffarian D. Food is medicine: actions to integrate food and nutrition into healthcare. BMJ. 2020;369:m2482. https://doi.org/10.1136/bmj.m2482.
22. Tohit NFM, Ya RM, Haque M. Bridging the gap: integrating food security into healthcare for healthier futures—a scoping review. Adv Hum Biol. 2025;15(2):177–99. https://doi.org/10.4103/AIHB.AIHB_22_25.
23. Lavoie JG. Medicare and the care of first Nations, Métis and Inuit. Health Econ Policy Law. 2018;13(3–4):280–98. https://doi.org/10.1017/S1744133117000391.
24. Lavoie JG, Forget EL, Browne AJ. Caught at the crossroad: first Nations, health care, and the legacy of the Indian act. Pimatisiwin. 2010;8(1):83–100.
25. Mashford-Pringle AR. Self-determination in health care: A multiple case study of four First Nations communities in Canada. 2013.
26. Stefanon BM, Tsetso K, Tanche K, Morton Ninomiya ME. Effective health and wellness systems for rural and remote Indigenous communities: a rapid review. Int J Circumpolar Health. 2023;82(1):2215553. https://doi.org/10.1080/22423982.2023.2215553.
27. Kyoon-Achan G, Kinew KA, Phillips-Beck W, Lavoie J, Katz A. Collaborative and systems approach to transforming primary health care in Manitoba first nations communities. Int J Indig Health. 2021;16(1). https://doi.org/10.32799/ijih.v16i1.33207.
28. Mashford-Pringle A, Skura C, Stutz S, Yohathasan T. What we heard: Indigenous Peoples and COVID-19. 2021.
29. Oosterveer TM, Young TK. <article-title update="added">Primary health care accessibility challenges in remote indigenous communities in Canada's North. Int J Circumpolar Health. 2015;74:29576. https://doi.org/10.3402/ijch.v74.29576.
30. Wali S, Seidel J, Spence G, Innes L, Innes E, Simard A, et al. Heart health begins with community: Community-based research exploring innovative strategies to support first nations heart health. CJC Open. 2023;5(9):661–70. https://doi.org/10.1016/j.cjco.2023.06.006.
31. Louttit S. Data collection in Moose Factory. Ont Pimatisiwin. 2006;4(1):135–45.
32. Government of Canada. First Nation profiles: Moose Cree First Nation [Internet]. Ottawa (ON): Government of Canada; 2024 [cited 2025 Aug 19].

Available from: https://fnp-ppn.aadnc-aandc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=144 =eng
33. Burnette K, Hay T. Plundering the North: A history of settler colonialism, corporate welfare, and food insecurity. 2023.
34. Yangzom K, Masoud H, Hahmann T. Primary health care access among first nations people living off reserve, Métis and Inuit, 2017 to 2020. p. 3-18. Stat Can, 2023. https://www150.statcan.gc.ca/n1/pub/41-20-0002/412000022023005-eng.htm
35. Government of Canada. Ottawa Charter for Health Promotion: An international conference on health promotion. 1986. Available from: https://www.canada.ca/en/public-health/services/health-promotion/population-health/ottawa-charter-health-promotion-international-conference-on-health-promotion.html
36. Kickbusch I. The contribution of the world health organization to a new public health and health promotion. Am J Public Health. 2003;93(3):383–8. https://doi.org/10.2105/ajph.93.3.383.
37. Loukes KA, Ferreira C, Gaudet JC, Robidoux MA. Can selling traditional food increase food sovereignty for First Nations in northwestern Ontario (Canada)? Food Foodways. 2021;29(2):157–83. https://doi.org/10.1080/07409710.2021.1901385.
38. Robidoux M, Loukes KA, Vandermale EA, Keil TJ, Gaudet JC. Generations of gardeners regenerating the soil of sovereignty in Moose Cree First Nation: an account of community and research collaboration. Can Food Stud. 2023;10(3):109–32. https://doi.org/10.15353/cfs-rcea.v10i3.637.
39. Chataway CJ. An examination of the constraints on mutual inquiry in a participatory action research project. J Soc Issues. 1997;53(4):747–65. https://doi.org/10.1111/j.1540-4560.1997.tb02459.x.
40. Greenwood ML, de Leeuw SN. Social determinants of health and the future wellbeing of Aboriginal children in Canada. Paediatr Child Health. 2012;17(7):381–4.
41. Rains JW, Ray DW. Participatory action research for community health promotion. Public Health Nurs. 1995;12(4):256–61. https://doi.org/10.1111/j.1525-1446.1995.tb00145.x.
42. Whyte WF, Greenwood DJ, Lazes P, Pace LA, Argona DR, Costanza AJ, et al. Participatory action research: through practice to science in social research. Am Behav Sci. 1989;32(5):513–52.
43. Hall B. From margins to center? The development and purpose of participatory research. Am Sociol. 1992;23:15–28.
44. Minkler M, Wallerstein N, editors. Community-based participatory research for health: from process to outcomes. 2nd ed. San Francisco: Jossey-Bass; 2008.
45. Waterman H, Tillen D, Dickson R, de Koning K. Action research: a systematic review and guidance for assessment. Health Technol Assess. 2001;5(23):iii–157.
46. Lewin K. Action research and minority problems. J Soc Issues. 1946;2:34–46. https://doi.org/10.1111/j.1540-4560.1946.tb02295.x.
47. Brydon-Miller M, Greenwood D, Maguire P. Why action research? Action Res. 2003;1(1):9–28. https://doi.org/10.1177/14767503030011002.
48. Israel BA, Schulz AJ, Parker EA, Becker AB, Allen AJ, Guzman R. Critical issues in developing and following community-based participatory research principles. In: Minkler M, Wallerstein N, editors. Community-based participatory research for health. San Francisco: Jossey-Bass; 2003. pp. 53–76.
49. Wallerstein N, Duran B. Community-based participatory research contributions to intervention research: the intersection of science and practice to improve health equity. Am J Public Health. 2010;100(Suppl 1):S40–6. https://doi.org/10.2105/AJPH.2009.184036.
50. Geniusz W. Our knowledge is not primitive: Decolonizing botanical Anishinaabe teaching. Syracuse (NY): Syracuse University Press; 2009.
51. Kovach M. Indigenous methodologies: Characteristics, conversations and contexts. Toronto (ON): University of Toronto Press; 2009.
52. Lambert L. Research for Indigenous survival: Indigenous research methodologies in the behavioral sciences. Pablo (MT): Salish Kootenai College; 2014.
53. Kovach M. Emerging from the margins: Indigenous methodologies. In: Brown LA, Strega S, editors. Research as resistance: Critical, Indigenous and anti-oppressive approaches. Toronto (ON): Canadian Scholars'; 2005. pp. 19–36.
54. Restoule J-P, Lecture. Wise Practices II: Canadian Aboriginal AIDS Network; 2008.
55. Absolon KE. Kaandossiwin: How we come to know: Indigenous research methodologies. 2nd ed. Halifax (NS): Fernwood Publishing; 2011.
56. Gaudet JC. Pimatsiwin: Women, wellness and land-based practices of Omushkego youth. In: Robidoux MA, Mason CW, editors. A land not forgotten. Winnipeg (MB): University of Manitoba; 2017. pp. 124–45.
57. Smith LT. Decolonizing methodologies: Research and Indigenous peoples. New York (NY): Zed Books; 1999.
58. Willows ND. Ethical principles of health research involving Indigenous peoples. Appl Physiol Nutr Metab. 2013;38(11):iii–v. https://doi.org/10.1139/apnm-2013-0381.
59. Willows ND. Ethics and research with Indigenous peoples. In: Liamputtong P, editor. Handbook of research methods in health social sciences. Singapore: Springer; 2019. pp. 1847–70. https://doi.org/10.1007/978-981-10-5251-4_49.
60. Foley W, Schubert L. Applying strengths-based approaches to nutrition research and interventions in Australian Indigenous communities. Crit Diet. 2013. pp. 16-18. https://doi.org/10.32920/cd.v1i3.600
61. Flaminio AC. Kinship-Visiting: Urban Indigenous Deliberative Space. In Renewing Relationships: Indigenous Peoples and Canada, edited by K. Drake and B. Gunn, 2019. 143–167,Wiyawisewin Mikiwahp Native Law Center. Saskatoon: University of Saskatchewan.
62. Iacono J, Brown A, Holtham C. Research methods—a case example of participant observation. Electron J Bus Res Methods. 2009;7:39–46.
63. McGregor D, Restoule J, editors. Indigenous research: Theories, practices, and relationships. Toronto (ON): Canadian Scholars; 2018.
64. Braun V, Clarke V, Weate P. Using thematic analysis in sport and exercise research. In: Smith B, Sparkes AC, editors. Routledge handbook of qualitative research in sport and exercise. London: Routledge; 2016. pp. 191–205.
65. Thompson H, Mason CW, Robidoux MA. Hoop-style greenhouse gardening in the Wapekeka First Nation as an extension of land-based food practices. Arctic. 2018;71(4):387–401.
66. Richmond C, Steckley M, Neufeld H, Kerr RB, Wilson K, Dokis B. First Nations food environments: exploring the role of place, income, and social connection. Curr Dev Nutr. 2020;4(8):nzaa108. https://doi.org/10.1093/cdn/nzaa108.
67. Reading CL, Wien F. Health inequalities and social determinants of aboriginal people's health. Prince George (BC): NCCAH; 2009.
68. Syme SL. Social determinants of health: the community as an empowered partner. Prev Chronic Dis. 2003;1(1):A02.
69. Mosavel M, Simon C, van Stade D. The mother-daughter relationship: its potential as a locus for health promotion? Health Care Women Int. 2006;27:646–64.
70. Ray L. Exploring well-being in a First Nation community: A qualitative study. Master's thesis. Lakehead University; 2008.
71. Gurney R, Caniglia B, Mix T, Baum K. Native American food security and traditional foods: a review of the literature. Sociol Compass. 2015;9(8):681–93. https://doi.org/10.1111/soc4.12284.
72. Søvold LE, Naslund JA, Kousoulis AA, Saxena S, Qoronfleh MW, Grobler C, et al. Prioritizing the mental health and well-being of healthcare workers: an urgent global public health priority. Front Public Health. 2021;9:679397. https://doi.org/10.3389/fpubh.2021.679397.
73. Trickett EJ. Community psychology: individuals and interventions in community context. Annu Rev Psychol. 2009;60(1):395–419. https://doi.org/10.1146/annurev.psych.60.110707.163517.
74. Parker B, Burnett K, Hay T, Skinner K. The community food environment and food insecurity in Sioux Lookout, Ontario. J Hunger Environ Nutr. 2019;14(6):762–79. https://doi.org/10.1080/19320248.2018.1537867.
75. Leibovitch Randazzo M, Robidoux MA. The costs of local food procurement in a Northern Canadian first Nation community: an affordable strategy to food security? J Hunger Environ Nutr. 2019;14(5):662–83. https://doi.org/10.1080/19320248.2018.1464998.
76. Abbott PA, Davison JE, Moore LF, Rubinstein R. Effective nutrition education for aboriginal Australians: lessons from a diabetes cooking course. J Nutr Educ Behav. 2012;44(1):55–9. https://doi.org/10.1016/j.jneb.2010.10.006.
77. Shafiee M, Keshavarz P, Lane G, Pahwa P, Szafron M, Jennings D, et al. Food security status of Indigenous peoples in Canada according to the four pillars of food security: A scoping review. Adv Nutr. 2022;13(6):2537–59. https://doi.org/10.1093/advances/nmac081.
78. Lee A, Ride K. Review of nutrition among aboriginal and Torres Strait Islander people. Aust Indig Health Bull. 2018;18(1): 18-19.
79. Browne J, Lock M, Walker T, Egan M, Backholer K. Effects of food policy actions on Indigenous peoples' nutrition-related outcomes: a systematic review. BMJ Glob Health. 2020;5(8):e002442. https://doi.org/10.1136/bmjgh-2020-002442.
80. Aguiar W, Halseth R. Aboriginal peoples and historic trauma: the processes of intergenerational transmission. Prince George (BC): National Collaborating Centre for Aboriginal Health; 2015.
81. Prochaska JO, Velicer WF. The transtheoretical model of health behavior change. Am J Health Promot. 1997;12(1):38–48. https://doi.org/10.4278/0890-1171-12.1.38.

82. Sacca L, Shegog R, Hernandez B, Peskin M, Rushing SC, Jessen C, et al. Barriers, frameworks, and mitigating strategies influencing the dissemination and implementation of health promotion interventions in Indigenous communities: a scoping review. Implement Sci. 2022;17(1):18. https://doi.org/10.1186/s13012-022-01190-y.
83. Wright AL, Jack SM, Ballantyne M, Gabel C, Bomberry R, Wahoush O. How Indigenous mothers experience selecting and using early childhood development services to care for their infants. Int J Qual Stud Health Well-being. 2019;14(1):1601486. https://doi.org/10.1080/17482631.2019.1601486.
84. Huot S, Ho H, Ko A, Lam S, Tactay P, MacLachlan J, et al. Identifying barriers to healthcare delivery and access in the Circumpolar North. Int J Circumpolar Health. 2019;78(1):1571385.
85. Davies A, Gwynn J, Allman-Farinelli M, Flood V, Dickson M, Turner N, et al. Programs addressing food security for first nations peoples: a scoping review. Nutrients. 2023;15(14):3127. https://doi.org/10.3390/nu15143127.
86. Sinha V, Gerlach AJ, Bennett M, Balfour M. The implementation of jordan's principle in manitoba: final report. Assembly of Manitoba Chiefs; 2022.
87. Keenan A, Sadri P, Marzanek F, Pirrie M, Angeles R, Agarwal G. Adapting the CP@clinic program to a remote northern First Nation community: a qualitative study. Int J Circumpolar Health. 2023;82(1):2258025. https://doi.org/10.1080/22423982.2023.2258025.
88. Woodhead M. Early childhood development: delivering inter-sectoral policies, programmes and services in low-resource settings. HEART; 2014.
89. Lavallee LF, Poole JM. Beyond recovery: colonization, health, and healing for Indigenous people in Canada. Int J Ment Health Addict. 2010;8:271–81.
90. Sullivan E, McHardy M. In: White JP, Beavon D, Spence N, editors. Aboriginal well-being: canada's continuing challenge. Toronto (ON): Thompson Educational Publishing; 2007. p. 246.
91. Cohen D, Huynh T, Sebold A, Harvey J, Neudorf C, Brown A. The population health approach: conceptual and operational definitions for leaders in Canadian health care. SAGE Open Med. 2014;2:2050312114522618. https://doi.org/10.1177/2050312114522618.
92. Krahn GL, Robinson A, Murray AJ, Havercamp SM, Andridge R, Arnold LE, et al. It's time to reconsider how we define health: perspective from disability and chronic condition. Disabil Health J. 2021;14(4):101129. https://doi.org/10.1016/j.dhjo.2021.101129.
93. Moose Cree First Nation. (n.d.). Health Services. Retrieved October 24. 2025, from https://www.moosecree.com/departments/healthservices/

Publisher's note