Can J Diabetes xxx (2021) 1–7

Contents lists available at ScienceDirect

Canadian Journal of Diabetes

journal homepage: www.canadianjournalofdiabetes.com

DIABETES CANADA

Original Research

# Traditional Medicine and Type 2 Diabetes in First Nations Patients

Ralph Johnson [a,1]; Teri Fiddler [b,2]; Jazmin Pirozek MSc [c,3]; Janet Gordon COO [d]; Sumeet Sodhi MD, MPH, CCFP [e]; Jenna Poirier BSc [f,4]; Ribal Kattini [f,4]; Len Kelly MD, MSc, FCFP, FRRM [g,*]

[a] *Sioux Lookout, Ontario, Canada*
[b] *Thunder Bay, Ontario, Canada*
[c] *Shibogama Tribal Council, Kenora, Ontario, Canada*
[d] *Sioux Lookout First Nations Health Authority, Sioux Lookout, Ontario, Canada*
[e] *Toronto Western Hospital, University Health Network, Department of Family and Community Medicine, University of Toronto, Toronto, Ontario, Canada*
[f] *Sioux Lookout Local Education Group, Sioux Lookout, Ontario, Canada*
[g] *Sioux Lookout Meno Ya Win Health Centre, Sioux Lookout, Ontario, Canada*

**Key Messages**

- Type 2 diabetes is experienced by many First Nations patients in the context of their cultural beliefs and a destructive historicopolitical reality.
- An associated sense of inevitability and fatalism may develop.
- Traditional medicine may improve self-management by promoting individual self-determination.

A R T I C L E I N F O

*Article history:*
Received 11 January 2021
Received in revised form
9 April 2021
Accepted 17 May 2021

*Keywords:*
First Nations
traditional medicine
type 2 diabetes

A B S T R A C T

*Background:* Diabetes may be a cultural experience for many First Nations patients. In this study, we explore the potential role for traditional medicine in the treatment of diabetes.
*Methods:* A responsive interviewing qualitative methodology was used for 10 First Nations key informant interviews. The first objective was to accurately “re-tell” participants’ stories. The second was to develop an overview of traditional medicine and its role in health and diabetes management by synthesizing academic literature, pre-existing local knowledge and perspectives, and stories shared by elders and traditional healers. The traditional medicine healers gave specific permission for this study and its publication.
*Results:* There is a strong cultural and historic context for the experience of diabetes in First Nations. Political and cultural suppression, lifestyle change and ongoing social determinants of health place diabetes in a unique context and generate a sense of fatalism. Traditional medicine can facilitate individual empowerment by connecting a patient with the lessons of previous generations and traditional beliefs and practices.
*Conclusions:* Traditional medicine can be a valuable resource for First Nations patients living with diabetes and should be considered as a therapeutic modality.

© 2021 Canadian Diabetes Association.

*Mots clés:*
Premières Nations
médecine traditionnelle
diabète de type 2

R É S U M É

*Introduction :* De nombreux patients des Premières Nations se représentent le diabète comme une expérience culturelle. Dans la présente étude, nous examinons le rôle potentiel de la médecine traditionnelle dans le traitement du diabète.

* Address for correspondence: Len Kelly MD, MSc, FCFP, FRRM, Sioux Lookout Meno Ya Win Health Centre, Box 489, Sioux Lookout, Ontario P8T 1A8, Canada.
*E-mail address:* lkelly@mcmaster.ca

[1] Traditional medicine teacher.
[2] Traditional elder consultant.
[3] Traditional medicine herbalist and consultant in traditional medicine.
[4] Research intern.

1499-2671/© 2021 Canadian Diabetes Association.
The Canadian Diabetes Association is the registered owner of the name Diabetes Canada.
https://doi.org/10.1016/j.jcjd.2021.05.007

*Méthodes :* Nous avons utilisé une méthodologie qualitative fondée sur l'entretien ouvert lors d'entrevues menées auprès des principaux informateurs des Premières Nations. Le premier objectif était de raconter de nouveau avec précision les récits des participants. Le second objectif était d'obtenir une vue d'ensemble de la médecine traditionnelle et de son rôle dans la prise en charge de la santé et du diabète par la synthèse de la documentation universitaire, des connaissances et des points de vue locaux préexistants, et des récits partagés par les aînés et les guérisseurs traditionnels. Les guérisseurs traditionnels nous ont donné une autorisation spéciale pour réaliser cette étude et la publier.
*Résultats :* L'expérience du diabète au sein des Premières Nations s'inscrit dans un contexte culturel et historique fort. La répression politique et culturelle, les changements dans le mode de vie et les déterminants sociaux actuels de la santé placent le diabète dans un contexte particulier et suscitent un sentiment de fatalisme. La médecine traditionnelle peut favoriser l'autonomisation individuelle en mettant en connexion le patient avec les leçons des générations précédentes et les croyances et les pratiques traditionnelles.
*Conclusions :* La médecine traditionnelle qui est une ressource précieuse pour les patients diabétiques des Premières Nations devrait être considérée comme une modalité thérapeutique.
© 2021 Canadian Diabetes Association.

## Introduction

Indigenous cultural beliefs and collective experiences affect the experience of diabetes for many First Nations individuals (1). There is a profound social and historical context that may affect an individual's thinking, sense of self and experience of illness. Despite its best intentions and effort, modern medicine seems to have little impact—and becomes a bystander to the increasing prevalence and sustained march of diabetes. Addressing diabetes prevalence, management and outcomes is recognized as a critical health issue by First Nations communities (2). Type 2 diabetes occurs at an earlier age in First Nations people and is accompanied by higher rates of morbidity and mortality than in non-Indigenous Canadians (3). Decades of assimilation and colonial practices have delivered adverse determinants of health, such as poverty, poor health, overcrowded housing and loss of the relationship with both tradition and the land (4,5). A relatively unexplored approach to diabetes management for First Nations patients is the use of traditional medicine. The context of diabetes in First Nations is complex. Proximal environmental effects of systemic discrimination, food insecurity and limited educational and employment opportunities compound lifestyle effects of decreased physical activity and consumption of high-calorie processed foods (6). High rates of gestational diabetes in Indigenous Australian mothers has introduced a "heritage effect," with diabetic sequelae for both mother and child (7). These processes are compounded by cultural loss and learned helplessness (3,8). In 2008, Crowshoe et al noted "the prevalence of diabetes within families and communities contributes to a fatalism and to a feeling of its inevitability" (3). In 2015, the Truth and Reconciliation Commission called upon those "who can effect change within the Canadian health-care system to recognize the value of Aboriginal healing practices and use them in the treatment of Aboriginal patients in collaboration with Aboriginal healers and elders where requested by Aboriginal patients" (4). A 2019 report by the Chiefs of Ontario identified the need for "wholistic diabetes preventive care" (9). The lessons of the ancestors may provide this alternate perspective. In this study, we examine the role traditional medicine can play in management of diabetes.

## Methods

This qualitative research was conducted in a respectful manner that valued oral traditional and personal experience as valid sources of knowledge. Ten key informant interviews were conducted in Sioux Lookout with First Nations participants by a non-Indigenous health-care researcher and retired physician with longstanding involvement in regional health care and who was known to all the First Nations interviewees.

Participants were chosen for their acknowledged role in regional health care and included 6 men and 4 women between 35 and 70 years of age. Three were actively involved in traditional medicine practices, 5 were elders and 2 were First Nations health-care administrators. The 3 traditional medicine practitioners, "healers," were known within the community and self-identified as participating in regional Anishinaabe healing practices. Respect of the regional Indigenous protocol included a gift of tobacco to the traditional healers to give thanks for information-sharing, and a commitment for the study to be purposeful.

Oral tradition and storytelling are important First Nations ways of communicating information and meaning and adapting; our qualitative research methodology facilitated this storytelling approach (10). We chose Rubin and Rubin's method of responsive interviewing, which allows the interviewer to understand the experiences of participants through their own words and stories to create meaning (11). With this approach, the "conversational partner" has an active role in determining the shape of the discussion. The objective was to understand diabetes from a First Nations perspective, which could include personal and family experiences, as well as historical and current social context. Written notes were taken, followed by a postinterview written summary of key interview components. Reliability was confirmed by member checking of written interview summaries and approval of the final draft.

Data analysis involved identifying key points and significant stories from the perspective of both participants in the conversation. The interviewer's role beyond participating in the conversation was to accurately "re-tell" the stories. The second objective was to develop an overview of traditional medicine and its role in health and diabetes management by synthesizing academic literature, pre-existing local knowledge and the perspectives and stories shared by the elders and traditional healers.

The Anishinaabe elders and traditional healers gave explicit permission for publication, approved the final draft and participated in authorship. The study topic was requested by the Sioux Lookout First Nations Health Authority, which supports primary health-care services for a population of 25,000 in 26 remote First Nations communities in northwestern Ontario. The Authority requested an examination of the role of traditional medicine in community-based diabetes management and supervised the project and its publication, and ensured respect for traditional knowledge and practices. The Sioux Lookout

Meno Ya Win Health Centre Research Review and Ethics Committee granted ethics approval.

## Results

### *Cultural and historical context*

*Diet and lifestyle changes:* Participants identified diet and physical inactivity as the major elements in development of diabetes. Elders recalled eating traditional foods and having an active outdoor family lifestyle. In this rural area, where hunting and fishing are still commonplace, one traditional healer noted an increasing difficulty in "accessing places to fish and harvest wild rice … we are not eating foods off the land that we are used to, (now) we eat junk and don't exercise enough ... food used to be high in protein, now it's processed," As children, their meals often consisted of "one ingredient, such as game meat or fish. There was no dessert but, in the summer, we could eat as many berries as we liked."

An elder recalled walking for miles, "we lived an active outdoor lifestyle, my family moved along the trap lines, we were always on the move … trucks and skidoos are used (now)."

One health-care administrator commented: There are active people now, but there are many conveniences … but there is no rosy picture of the past; there were times of starvation and the First Nations may have adapted to energy storage, as they could still function while going days without food.

They recalled the 2004 discovery of the 5,000-year-old remains of a regional First Nations community (identified as a 20-year-old male of Amerindian status): "there were no dental cavities, the shoulder showed evidence of an active life of paddling." The sedentary lifestyle is historicopolitical; it "began in the late 1800s, with the beginning of the Indian Act and reservations."

### *Self-determination and health*

Diet and physical activity reflected deeper concerns. Participants portrayed the diet and active lifestyle of previous generations as evidence of a self-determined life. One traditional healer commented: "We still live in the same environment as our ancestors, what has changed is the way we think and live … Anishinaabe (people) are guided by what they have been told, which has been negative and destructive: that they have "no control" over what is drilled into them; they need to change this mindset. This is the first step toward healing, including diabetes."

Although traditional medicine involves specific regional beliefs and practices, the shared cultural background is the wisdom and knowledge of "the ancestors," the beliefs, stories or practices passed down from previous generations. The Seven Teachings of the Grandfathers represent core Anishinaabe values, which guide contact with others: truth, honesty, humility, respect, bravery, love and wisdom" (12).

An elder shared: "The biggest lesson from traditional medicine is the sharing of the worldview of the ancestors and their spirituality." The ancestral values and lifestyle portray a sense of "control and belief in oneself." First Nations communities before contact with Western influences experienced freedom and self-determination—choices of where to live and travel. Dietary choices were "gifts from nature," determined by location, season and community practices. The historic move from a somewhat nomadic lifestyle to the establishment of the reservation system "affected both health and how we viewed the world."

A traditional healer identified the ancestral worldview of health as a balance of mind, body and spirit that integrates spirituality and ecology: "… a part of the spirituality and ecology is respect for plants and animals, you cannot gorge yourself; the elders tell us how animals live with each other, one group does not annihilate another group as their survival is interdependent." The multifactorial context for diabetes is outlined in Figure 1.

Participants expressed concern about the modern focus on "disease management" rather than personal change." Western institutions "undermine traditional knowledge … when you are diagnosed with diabetes it is time to make changes." They noted "the powerful legacy of the grandmothers who treated illness without pills or hospitals." One of the traditional healers characterized patients with diabetes as "having a lot of faith in what they are being told (by doctors) instead of an alternate way." What is absent is the recognition that "the patient has the ability to heal themselves … to trigger the natural ability to heal." One healer remarked:

> Healing includes understanding and achieving a sense of balance in one's life and a connectedness to themselves, their family, their clan and nature. All components of balance are involved: mental, emotional, physical and spirituality issues. The examples of the ancestors speak to a diet with no processed foods, and awareness that one can choose and control one's diabetic status, glucose control and a physically active lifestyle.

### *Traditional medicine*

From one traditional healer's perspective, among the most important lessons from the spirituality of the ancestors that can be accessed through traditional medicine is: "we have the ability inside of you and you have that capacity (to heal) and healing requires an understanding of life from a place of love, the love the Creator has."

One healer described a sense of helplessness in a young man from a family affected by diabetes: "Who will be the next amputee in the family?" The inevitability of poor outcomes is accepted: "We need to tell them they can change, stop the pop and chips!" and "We are guided by what we have been told, oppression; that we have 'no control' is drilled into their thinking— they need to change that mindset."

The role of traditional medicine is to "show them there is another way that has to be taken into account." However, it is

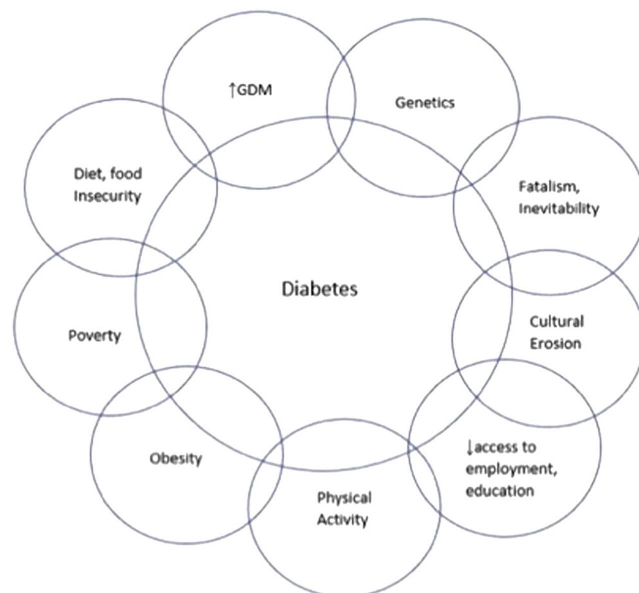


**Figure 1.** Context for diabetes in First Nations. *GDM*, gestational diabetes mellitus.

"…undervalued, Western medicine does not recognize the sacred knowledge of Aboriginal people … and traditional medicine is not valued." Traditional medicine can "give people permission to look after themselves and be more aware that they are letting their health go."

Against a background of the knowledge, wisdom and spirituality of the ancestors, the traditional healers described common avenues of traditional medicine, including sharing circles and traditional counselling, ceremonies and herbalism. Some of the pathways for traditional medicine are outlined in Figure 2. Knowledge of these traditions was interrupted by the history of residential schools, "where children did not grow up with their parents and lost this link to traditional knowledge" (Figure 2).

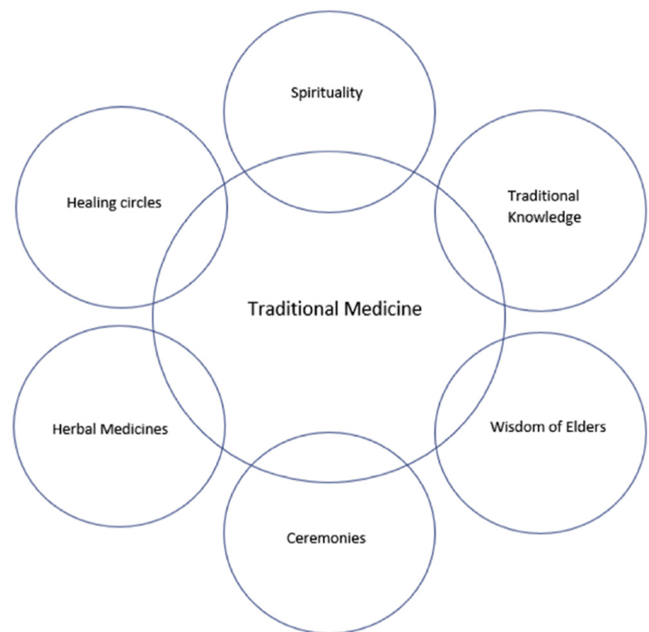


**Figure 2.** Pathways of traditional medicine.

*Healing circles*

One elder noted that achieving support in a culturally safe manner can begin to restore a sense of balance and control and, at least temporarily, return to a "way of thinking about health and life that belonged to the Anishnaabe people in past generations to look after oneself." Individual counselling and sharing or healing circles incorporate smudging and other ceremonies. A traditional counsellor remarked, "people lack the energy to look after themselves." Healing circles have clear protocols, beginnings and endings. Smudging, the application of smoke from the burning of herbs, may initiate individual or group sessions to remove negative influences (sage) and, upon completion, promote kindness and positive energy (sweetgrass). Confidentiality is explicit, as is allowing individuals to remain silent or express concerns.

*Herbalism*

In addition to teachings and ceremonies, traditional nutritional and herbal pathways contribute to the emotional and spiritual balance required for healing. The "Ooweechiwaywin" are the keepers of dietary and herbal interventions (13).

The First Nations traditional herbalist participant described the spiritual and pharmacologic properties of plant medicine: "Each plant has specific teachings that are inherent to the spirit of the plant. I was taught that you can ask any plant for help with what you need, but you must ask."

The medicinal and spiritual properties can be distinguished: "It is not necessary to believe in the spiritual animation of the plant world to benefit from the plants, however reciprocity and gratefulness is important."

The knowledge is handed down between generations and is often known by some community members: "I grew up in the bush using common bush medicines with mother."

Careful collection and preparation of plant medicine is particular to each plant, its locale and the season: "Each portion of the plant has its own benefits and way of collection, preservation and preparation: flowers, fruits, leaves, bark/cambium-stalk/trunk and roots. Each have different preparatory methods."

Loss of language and cultural practices are interconnected. The traditional herbalist commented: "Another especially important note is that the loss of language in the north allows the loss of traditional practices and knowledge of the plants." They continued: "food security…debris." Food security on remote First Nations communities is a major factor: Genetics is not as important as food; people do not control the type of food that gets shipped in (to their remote community), it's about food access, they get addicted to unhealthy foods. Communities with easier access to traditional wild food have better options. We need to be able to choose what is in the store and get rid of the debris.

Traditional medicine knowledge needs to be protected from bio-piracy. One elder noted: "They have taken everything else from us, my teacher told me to never share knowledge of traditional plant medicine."

In 2003, the James Bay Cree people of Eeyou Istchee began an inventory of land medicine and its uses in the treatment of illnesses, including diabetes. Community-driven field work, in conjunction with scientists from the Canadian Institutes of Health Research (CIHR), established the Team in Aboriginal Anti-Diabetic Medicines Project (14). They performed numerous bioassays and documented (in vitro) chemical pathways for controlling diabetes in plant derivatives in northern Québec (14). These boreal forest bioassays have yet to be used in a clinical trial. This has left unresolved the role plant medicines can play in the treatment of diabetes, thus presenting considerable challenges for Western health-care providers. As with any pharmaceutical initiative, traditional healers practicing herbalism recognize the importance of informed consent, patient safety and monitoring of side effects. They identified the need for continuity of care and follow up with the traditional medicine practitioner.

*The Seventh Generation Principle*

Traditional knowledge can enlighten present and future health behaviours, decisions and practices. The effect of current decisions and behaviours on future generations is an important consideration in health decision-making from a First Nations worldview. This philosophy is often referenced as the Seventh Generation Principle, which holds that present-day decisions be mindful of the effects of the outcome on the next 7 generations. Believed to have begun with the Great Law of the Iroquois Confederacy around 1500 AD, it acknowledges that current decisions and relationships must be sustainable into the future (15).

One healer described the constitution of the 21 strands of sweet grass used in smudging (the "kindness medicine") as an integration of past and future generations: "7 strands for ancestors; 7 strands for teachings of the grandfather; and 7 strands for the children and the future generations."

If traditional knowledge reflects the wisdom of previous generations, the Seventh Generations Principle ensures the welfare of those to come. The interconnectedness of traditional medicine

ARTICLE IN PRESS



pathways, ancestral knowledge and grandfather teachings to the next 7 generations is portrayed in Figure 3.

## Discussion

Study informants characterized the overall experience of patients with diabetes as steeped in an evolving historicopolitical context, which may result in learned helplessness and fatalism. Provision of a culturally appropriate clinical environment and participation in traditional medicine may enable personal empowerment and improved disease self-management.

It is important to recognize that the practice of "medicine as a distinct practice" is a Western concept. In an Indigenous worldview, disease management is a dynamic cultural intervention. Traditional medicine has several pathways to support personal self-determination, including traditional counselling and teachings, ceremonies, healing circles and the use of plant medicine. The use of traditional medicine is not homogeneous; a patient need not participate in the associated spirituality to benefit. It can be the use of traditional diet, plant medicines or a way of life, and a holistic dynamic connected to culture, family and community (16–18). All approaches are steeped in knowledge and practices from earlier generations in a First Nations community, whose members are their custodians.

Traditional medicine is a possible starting point to counteract the cultural loss and learned helplessness associated with diabetes (1,3,9). Traditional healers describe how the first lesson from the ancestors is a "sense of self-determination and belief in oneself." Ancestors chose where to live and travel; dietary choices were gifts from nature, determined by location, season and community practices (16). These teachings have the power of connectedness to one's heritage and the ongoing influence of the traditional grandfather lessons; respect, love, courage, humility, wisdom, truth and honesty are signposts of living well in the present (12). The lessons of the ancestors may provide an alternative to one's current perspective.

Health-care providers should not assume that all First Nations individuals living with diabetes will have an interest or a belief in traditional medicine. Some First Nations communities have a strong Christian tradition for which the spirituality associated with traditional medicine is antithetical. Caregivers should be mindful of this and proceed with a discussion of the use of traditional medicine with explicit patient acknowledgment and consent.

The first step in providing culturally appropriate care is cultural humility—the acknowledgment that culture may play an important role in the patient's belief system and their experience of diabetes (19). The importance of culture and its effect on health are well established (20). In 1998, Chandler and Lalonde described the association between cultural continuity and mental health in First Nations communities in British Columbia (21). Social and cultural cohesion, measured as self-government, control of community health and education programming, and traditional intergenerational connectedness, were associated with lower rates of suicide (21). The 2005 First Nations Regional Health Survey documented that 75% of on-reserve community members considered traditional spirituality and religion "important in their lives" (22).

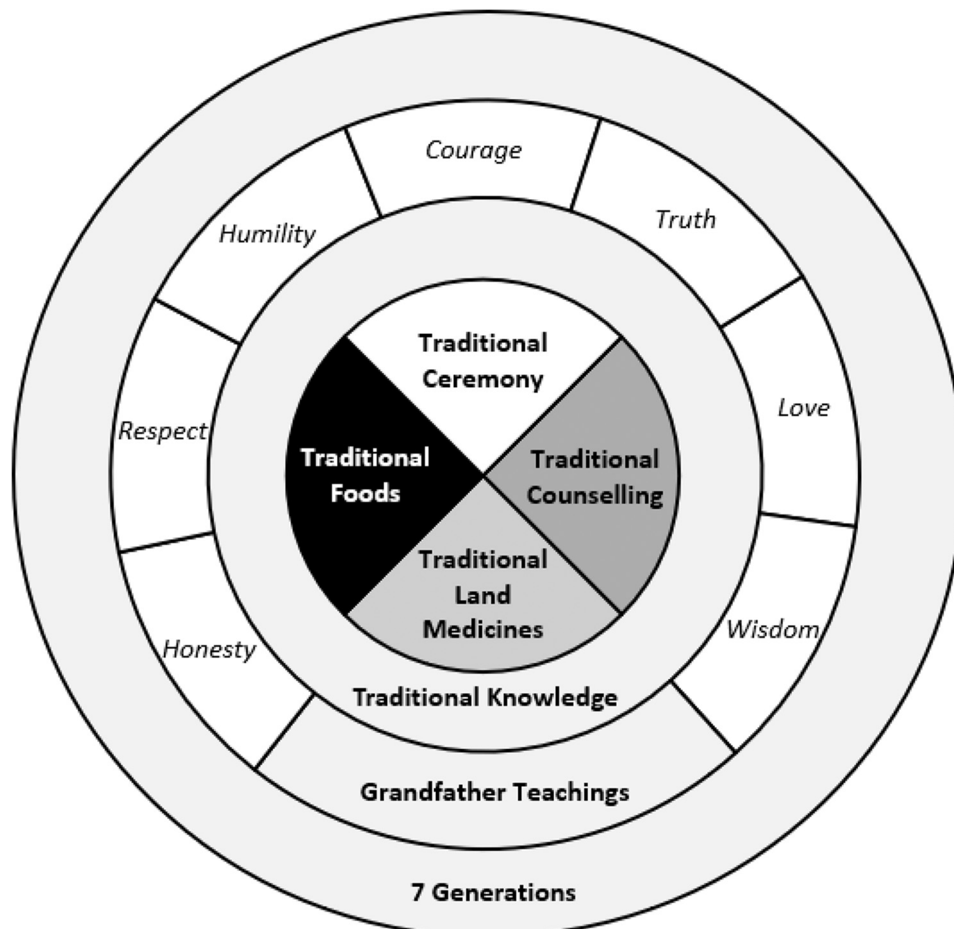


**Figure 3.** Traditional medicine in past, present and future generations.

ARTICLE IN PRESS



Research on diabetes in First Nations over the past 30 years has documented the importance of cultural safety, an awareness of the power dynamics experienced by an individual of a different culture. Self-reflection by the health-care professional is required to provide safe care as defined by patients and their communities (23). Knowledge translation has been limited. Numerous insightful qualitative studies have documented the need for cultural safety and culturally appropriate care (23,24). Recent research has identified ongoing cultural discrimination in health care (25,26). In their 2017 qualitative study, Jacklin et al showed that patients' engagement with diabetes care was influenced by "personal and collective historical experiences with health-care providers and contemporary exposures to culturally unsafe health care" (1).

Medical caregivers may not understand the social and cultural contexts for First Nations patients living with diabetes, the power imbalance between patient and caregiver, the diverse health-care needs and the systemic and bureaucratic barriers to accessing care (25). In 2020, Allen et al suggested cross-cultural health-care practitioners begin to bridge that gap by learning greetings in the local language, becoming familiar with local traditional practitioners and being "open to other ways of knowing and forms of evidence" (27). They specified the use of language, knowledge and access to elders and traditional healers as important components of successful Indigenous-led health collaborations that include the introduction of traditional beliefs. These initiatives improve respect for culture and improve medical outcomes (28).

The challenge is in the development of a new service paradigm that integrates traditional and Western medicine. Traditional medicine practices, ceremonies and land medicines vary among the 50 Indigenous nations in Canada, each with their own distinct language (29). Traditional medicine has not received regional or national protection and promotion. Having historically gone "underground" to avoid cultural assimilation, the resurfacing of cultural identity and traditional regional healing practices occur uniquely in each nation and community.

Traditional medicine care can be implemented as stand-alone healing pathways or as health-care programs developed in collaboration with First Nations communities (27,30). "Two-eyed seeing" describes the partnering of Western and traditional Indigenous health perspectives (31). Combining these requires collaboration between 2 parties who are largely unknown to one another. These initiatives require trusting relationships that take time, as each party moves beyond established professional, cultural and historic realities. Several initiatives have already successfully incorporated traditional knowledge. Manitoulin First Nations counselling services have included access to elders, as well as clinical psychologists, in a decades-old mental health practice (32). The Giigewigamig Traditional Healing Centre in Pine Falls, Manitoba, promotes referrals from doctors to traditional healers, and members perform sweat lodge ceremonies onsite at the local hospital (33). The Turtle Lodge of the Manitoba Sagkeeng First Nation partners health-care providers with elders, healers and knowledge keepers (34).

Community-based diabetes prevention programming has been ongoing for decades in schools in Kahnawake, Québec, with the Zhiiwapenewin Akino'maagewin: Teaching to Prevent Diabetes program (35). The diabetes clinic in Haida Gwaii, British Columbia, which includes traditional diet and plant medicine, and the Sandy Lake School Diabetes Program, are longstanding community-led initiatives (36,37). There are many similarities between the community (macro) and individual (micro) levels. Nation-to-nation discussion of self-determination and individual cultural connectedness both address the distal determinants of cultural suppression and discrimination. However, improving outcomes in the management of chronic diseases, such as diabetes, will require changes in their proximal determinants, which include poverty and limited access to education, health care and employment. This requires changes at many levels, but delivering culturally safe and relevant models of care is essential.

Strengthening cultural ways of life, including through traditional medicine, can empower self-determination, which will benefit the patient and provide the basis for Indigenous health-care partnerships (38). It can be a first step in addressing the health-care gap identified by the Truth and Reconciliation Commission, and diabetes care represents a timely opportunity (4). One traditional healer summarized: "Traditional medicine and knowledge focuses on wellness … to clarify what role you take in life; we are all responsible for that."

In conclusion, First Nations patients experience diabetes from a context of cultural beliefs and a unique historicopolitical reality. Understanding the contribution traditional medicine can make to diabetes prevention and management requires patients and health-care providers to listen to the lessons of the past. Patients may prefer an integration of modern and traditional medicine and these opportunities should be available.

## Acknowledgments

This study was supported by a grant from the Sioux Lookout First Nations Health Authority.

## Author Disclosures

Conflicts of interest: None.

## Author Contributions

R.J. contributed content and approved final draft; T.F. contributed content and approved final draft; J.Pirozek contributed content and approved final draft; J.G. conceptualized study and approved all content and final draft; S.S. conceptualized study and contributed to final draft; J.Poirier did literature reviews, data collection and approved final draft; R.K. did literature review and approved final draft; L.K. served as principal author, performed interviews and data collection and authored final draft.

## References

1. Jacklin K, Henderson R, Green M, Walker L, Calam B, Crowshoe L. CMAJ 2017; 189:E106–12.
2. Sioux Lookout First Nations Health Authority Annual Report 2019–2020. Community Health Worker Diabetes Program. https://www.slfnha.com/governance/annual-reports. Accessed April 8, 2021.
3. Crowshoe L, Dannenbaum D, Green M, Henderson R, Hayward MN, Toth E. Type 2 diabetes and Indigenous peoples. Can J Diabetes 2018;42(Suppl):s296–306.
4. Truth and Reconciliation Commission of Canada. Honouring the truth, reconciling for the future. http://publications.gc.ca/site/eng/9.800288/publication.html. Accessed May 30, 2019.
5. Wesley-Esquimaux C, Smolewski M. Historic trauma and aboriginal healing. Ottawa, Ontario: Aboriginal Healing Foundationhttp://www.ahf.ca/downloads/historic-trauma.pdf. Accessed December 4, 2020.
6. Kunes J, Vanecjova I, Mikuluskova B, Behuliak M, Maletinska L, Zicha J. Epigenetics and a new look on metabolic syndrome. Physiol Res 2015;64:611–20.
7. Chamberlain CR, Oldenburg B, Wilson AN, et al. Type 2 diabetes after gestational diabetes: Greater than fourfold risk among Indigenous compared with non-Indigenous Australian women. Diabetes Metab Res Rev 2016;32:217–27.
8. Aguiar W, Halseth R. Aboriginal peoples and historical trauma: The process of intergenerational transmission. Prince George, BC: National Collaborating Centre for Health, 2015.
9. Green ME, Jones CR, Walker JD, et al., editors. First Nations and Diabetes in Ontario. Toronto: ICES, 2019.
10. Datta R. Traditional storytelling: An effective Indigenous research methodology and its implications for environmental research. AlterNative 2018;14:35–44.
11. Rubin HJ, Rubin IS. Qualitative Interviewing: The Art of Hearing Data. 2nd ed. Thousand Oaks, CA: Sage, 2005.
12. Eshkakogan D. Nishinaabe Bimiiadziwin Kinoomaadwinan: Teachings of the Medicine Wheel; Teachings of the Seven Grandfathers. https://www.sofn.band/index.php/teachings/the-seven-grandfathers. Accessed May 8, 2020.

13. Sioux Lookout First Nations Health Authority. Anishinabe Health Plan. Sioux Lookout, ON. https://docplayer.net/65501637-sioux-lookout-first-nations-health-authority-slfnha-the-anishinabe-health-plan.html 2006. Accessed April 8, 2021.
14. Canadian Institute for Health Research Team for Anti-diabetic Medicines. http://www.taam-emaad.umontreal.ca. Accessed December 17, 2019.
15. Indigenous Corporate Training, Inc. What is the Seventh Principle? 2012. https://www.ictinc.ca/blog/seventh-generation-principle. Accessed December 17, 2019.
16. Hnatiuk G. First Nations Medicine Diet. First Nations Health Authority. Vancouver, BC: Coast Salish Territory West, 2013.
17. Crowshoe C. Sacred way of life: Traditional knowledge. First Nations Centre (FNC). Ottawa, ON: National Aboriginal Health Organization. https://ktpathways.ca/system/files/resources/2019-02/traditional_knowledge_toolkit_2005.pdf. Accessed December 17, 2019.
18. Martin Hill D. Traditional medicine in contemporary contexts; protecting and respecting Indigenous knowledge and medicine. National Aboriginal Health Organization. https://epub.sub.uni-hamburg.de//epub/volltexte/2013/15417/pdf/research_tradition.pdf. Accessed December 4, 2020.
19. Kelly L. Culture in medicine. In: Community-based Medicine: A Teacher's Handbook. London: Radcliffe, 2012. p. 86–92.
20. Reading C, Wien F. Health inequities and social determinants of health of Aboriginal peoples' health. National Collaborating Centre for Aboriginal Health. https://www.ccnsa-nccah.ca/docs/determinants/rpt-healthinequalities-reading-wien-en.pdf. Accessed December 4, 2020.
21. Chandler M, Lalonde C. Cultural continuity as a hedge against suicide in Canada's First Nations. Transcultural Psychiatry 1998;35:191–219.
22. First Nations Regional Longitudinal Health Survey 2002–2003: Results for adults, youth and children living on First Nations reserves. Ottawa, ON: National Aboriginal Health Organization, 2005.
23. Barton SS. Using narrative inquiry to elicit diabetes self-care experience in an Aboriginal population. CJNR 2008;40:16–36.
24. Daniel M, Green L, Marion SA, et al. Effectiveness of community-directed diabetes prevention and control in a rural Aboriginal population in British Columbia, Canada. Social Sci Med 1999;48:815–32.
25. Firestone M, Syrette J, Jourdain T, Recollet V, Smylie J. "I feel safe just coming here because there are other Native brothers and sisters": Findings from a community-based evaluation of the Niiwin Wendaanimak Four Winds wellness program. Can J Public Health 2019;110:404–13.
26. Allan B, Smylie J. First Peoples, Second Class Treatment: The Role of Racism in the Health and Well-being of Indigenous Peoples in Canada. Toronto, ON: Wellesley Institute, 2015.
27. Allen L, Hatala A, Ijaz S, et al. Indigenous-led health care partnerships in Canada. CMAJ 2020;192:E208–16.
28. Tremblay MC, Graham J, Porgo TV, et al. Improving cultural safety of diabetes care in Indigenous populations of Canada, Australia, New Zealand, and the United States: A systematic rapid review. Can J Diabetes 2020;44:670–8.
29. Indigenous Peoples and Communities. Crown-Indigenous relations and northern affairs Canada. https://www.rcaanc-cirnac.gc.ca/eng/1100100013791/1535470872302 2020. Accessed December 4, 2020.
30. Obomsawin R. Traditional medicine for Canada's first peoples. https://soilandhealth.org/wp-content/uploads/02/0203CAT/020337.traditional.medicine.pdf 2007.
31. Aboriginal Children's Hurt & Healing Initiative. Two-eyed seeing. https://achh.ca/about-us/our-approach-two-eyed-seeing 2020. Accessed December 4, 2020.
32. Maar MA, Shawande M. Traditional Anishinabe healing in a clinical setting: The development of an Aboriginal interdisciplinary approach to community-based Aboriginal mental health care. J Aboriginal Health 2010;6:18–27.
33. Giigewigamig First Nation Health Authority. Giigewigamig Healing Centre. http://www.ierha.ca/default.aspx?cid=15386&lang=1. Accessed December 14, 2020.
34. Turtle Lodge, International Centre for Indigenous Education and Wellness, Onjisay Aki, Sagkeeng First Nation. http://onjisay-aki.org. Accessed December 4, 2020.
35. Paradis G, Levesque L, Macaulay A, et al. Impact of a diabetes prevention programming Kanien'keha:Ka children 6 to 11 years old. Pediatrics 2002;115:333–9.
36. Heffernan C, Herbert C, Grams GD, et al. The Haida Gwaii Diabetes Project: Planned response activity outcomes. Health Soc Care Commun 1999;7:379–86.
37. Saksvig B, Gittelsohn J, Harris S, Hanley A, Valente T, Zinman B. A pilot school-based healthy eating and physical activity intervention improves diet, food knowledge, and self-efficacy for Native Canadian children. J Nutr 2005;135:2392–8.
38. Metisse Rivers J. The land is a healer: Perspectives on land-based healing from Indigenous practitioners in northern Canada. Int J Indigenous Health 2020;15:90–107.