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Appreciative Inquiry in Evaluating the Integrated Primary Oral Health Services in Quebec Cree Communities

Par

Richa Richa (Shrivastava)

Sciences Biomédicales, Option Sciences Buccodentaires

Université de Montréal

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Présentée par

Richa Richa (Shrivastava)

A été évaluée par un jury composé des personnes suivantes:

Pierre Haddad
Représentante du doyen

Gilles Lavigne
Président rapporteur

Elham Emami
Directrice de recherche

Yves Couturier
Codirecteur de recherche

Shalini Lal
Membre du jury

Christian Caron
Examinatrice externe

Résumé

Introduction: L'intégration de la santé buccodentaire aux soins de santé primaires a été présentée comme une stratégie visant à réduire les inégalités en santé buccodentaire parmi les populations prioritaires telles que les communautés autochtones. Cependant, il existe encore peu de programmes de soins de santé buccodentaire intégrés aux soins primaires mis en œuvre dans le monde. Par conséquent, les objectifs de ce projet de recherche doctorale étaient: 1) de cartographier systématiquement les programmes disponibles et de faire le portrait de leurs résultats sur les soins intégrés de santé buccodentaire primaires dans les communautés autochtones, et 2) d'explorer comment et dans quelle mesure l'intégration de la santé buccodentaire dans les soins primaires répond aux besoins en santé buccodentaire des communautés cries du Québec.

Méthodes: Objectif 1) Une étude de portée a été réalisée selon le cadre méthodologique proposé par Arksey & O'Malley et son extension par Levac et ses collègues. Nous avons effectué des recherches systématiques dans des bases de données électroniques, dans la littérature grise, ainsi que dans des sites Web d'organisations de santé autochtones, et les résultats ont été compilés à l'aide d'un résumé numérique et d'une analyse qualitative de contenu. Objectif 2) Une étude de cas multiples avec une approche qualitative et une méthodologie d'évaluation développementale a été utilisée pour explorer les soins de santé buccodentaire primaires au Conseil cri de la santé et des services sociaux de la Baie James (CCSSSBJ). En utilisant le modèle 4D d'enquête appréciative comme cadre conceptuel, un total de six discussions de groupe et 36 entretiens individuels ont été menés avec des patients autochtones, des prestataires de soins de santé et des gestionnaires. La collecte de données comprenait un examen de la documentation, des discussions de groupe et des entretiens individuels approfondis. L'analyse thématique a été utilisée pour l'analyse des données et a été réalisée autant à l'aide du logiciel Atlas-ti, que manuellement.

Résultats: L'étude de portée a identifié 30 programmes de soins de santé buccodentaire primaires intégrés pour les communautés autochtones en Australie et en Amérique du Nord. Ces programmes ont été classés en quatre groupes: programmes de promotion et de prévention de la santé buccodentaire; services dentaires globaux; modèle de services *fly-in, fly-out*; et des ser-

vices à distance utilisant une plateforme de télédentisterie. Ces programmes se sont avérés efficaces en améliorant leur l'accès aux soins de santé buccodentaire, les connaissances et les comportements perçus en matière de santé buccodentaire et l'état de santé buccodentaire.

Les résultats de l'étude de cas ont révélé que la planification stratégique du CCSSSBJ a réussi à intégrer la santé buccodentaire aux soins de santé primaires. Les stratégies intégrées de soins buccodentaires au CCSSSBJ étaient déployés tant aux niveaux micro, méso que macro. Un leadership fort, une gestion organisée et structurée, des soins centrés sur le patient, la continuité des soins et des réseaux coordonnés, la co-localisation et des soins adaptés culturellement ont été les clés de succès. Les participants à l'étude souhaitaient une meilleure adéquation en ressources humaines et des rôles professionnels sans ambiguïté au niveau méso; augmenter la gestion de l'information au niveau méso dans le domaine grâce à une meilleure planification des rendez-vous, des dossiers de santé électroniques et des protocoles et directives d'orientation normalisés; ainsi que la sensibilisation aux médecines traditionnelles et l'incorporation des pratiques autochtones au niveau macro et dans le domaine normatif. De plus, les soins centrés sur le patient étaient rendus possibles par un environnement favorable et une prise de décision partagée, tandis que les soins de continuité relationnelle étaient facilités par la permanence professionnelle et une communication efficace.

Conclusion: Les résultats de l'étude de la portée suggèrent que les programmes de soins de santé buccodentaire primaires intégrés, axés sur la communauté et culturellement appropriés, semblent efficaces et pertinents pour améliorer l'état de santé buccodentaire et l'accès aux soins des communautés autochtones. Notre étude de cas suggère que l'organisation du CCSSSBJ a intégré efficacement la santé buccodentaire. L'organisation pourrait étendre le niveau d'intégration à une intégration complète en élargissant les programmes publics de santé buccodentaire, en optimisant les ressources humaines, en améliorant la gestion organisationnelle, en favorisant une communication efficace et en intégrant les pratiques traditionnelles. Des évaluations basées sur les particularités de divers groupes de population sont nécessaires pour mieux comprendre les facteurs associés à l'intégration durable de la santé buccodentaire dans les services de santé.

Mots clés : Populations autochtones, Systèmes de soins de santé intégrés, Soins de santé primaires, Soins dentaires, Évaluations des services de santé, Enquête appréciative

Abstract

Introduction: The integration of oral health into primary health care has been introduced as a strategy to decrease oral health disparities among priority populations such as Indigenous communities. However, still there are few integrated primary oral health care programs implemented around the world. Therefore, the objectives of this doctoral research project were: 1) to systematically map the available programs and their outcomes on the integrated primary oral health care in Indigenous communities, and 2) to explore how and to what extent the integration of oral health into primary care addresses the oral health needs of the Quebec Cree communities.

Methods: *Objective 1)* The scoping review was performed following the methodological framework proposed by Arksey & O'Malley and its extension by Levac and colleagues. We performed systematic searches through electronic databases, Indigenous health organizational websites as well as grey literature, and the findings were summarized using numeral summary and qualitative content analysis. *Objective 2)* A multiple-case-study design within a qualitative approach and developmental evaluation methodology was used to explore the primary oral health care at the Cree Board of Health and Social Services of James Bay (CBHSSJB). Using the 4D model of appreciative inquiry as a study framework, a total of six focus group discussions and 36 individual interviews were conducted with patients, health care providers, and administrators. Data collection included documentation review, focus group discussions, and individual in-depth interviews. Thematic analysis was used for data analysis and was performed with the help of Atlas-ti software as well as manually.

Results: The scoping review identified 30 programs on integrated primary oral health care for Indigenous communities in Australia and North America. These programs were classified into four groups: oral health promotion and prevention programs; comprehensive dental services; fly in, fly out dental services; and remote services using a teledentistry platform. These programs were found to be effective in improving oral health care access, oral health services, perceived oral health knowledge and behaviors, and oral health status of Indigenous people.

The case study results found that CBHSSJB's strategic planning has successfully integrated oral health within primary health care. The integrated oral health care strategies at CBHSSJB were distributed across micro, meso, and macro levels. Strong leadership, organized and structured

administration, patient-centered care, continuity of care and coordinated networks, co-location, and culturally competent care were the keys for its success. Study participants, on the other hand, wished for better human resourcing and unambiguous professional roles at the meso level; augmenting information management at the meso level in the functional domain through better appointment scheduling, electronic health records, and standardized referral protocols and guidelines; as well as raising awareness of traditional medicines and incorporation of Indigenous oral health practice at the macro level and in the normative domain. In addition, patient-centered care was enabled by the supportive environment and shared decision-making, while relational continuity care was facilitated by professional permanence and effective communication.

Conclusion: The scoping review results suggest that community-based and culturally appropriate integrated primary oral health care programs seem to be efficient and pertinent in improving the oral health status and access to care of Indigenous communities. Our case study suggests that the CBHSSJB organization has efficiently integrated oral health. The organization could extend the level of integration into full integration by expanding public oral health programs, optimizing human resources, improving organizational management, promoting effective communication, and integrating traditional oral health practices. Population-based evaluations are needed to better understand the factors associated with sustainable oral health integration in various populations.

Keywords:

Indigenous populations, Integrated health care systems, Primary health care, Dental care, Health services evaluations, Appreciative inquiry

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List of abbreviations

WHO	World Health Organization
CBHSSJB	Cree Board of Health and Social Services of James Bay
dmft/DMFT	Decayed, Missing, and Filled Teeth index (primary/permanent teeth)
Dmfs/DMFS	Decayed, Missed, and Filled Surface index (primary/permanent teeth)
NIHB	Non-Insured Health Benefits Program
COHI	Children's Oral Health Initiative
CLSCs	Centre local de services communautaires
SIPA	Services intégrés pour les personnes âgées
AI	Appreciative inquiry
PCC	Population-Concept-Context
PRISMA-ScR	Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews
CMCs	Community Miyupimaatisiiun Centres
CIHR	Canadian Institutes of Health Research
SRQR	Standards for Reporting Qualitative Research
IHWs	Indigenous Health Workers
FGD	Focus group discussion
CHR	Community Health Representative
AMA	Â Mâshkûpimâsît Awash
OCAP	Ownership, control, access, and possession
COREQ	Consolidated criteria for reporting qualitative research

Dedication

This work is dedicated to my husband Dr. Amit Shrivastava and my daughters Archita and Advika for their constant support, sacrifices, and encouragement throughout this journey.

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Foreword

Linking the research with ancient sacred literature of India 'Vedas'

Sanskrit

ॐ भद्रं कर्णेभिः शृणुयाम देवाः । भद्रं पश्येमाक्षभिर्यजत्राः ।।

स्थिरैरङ्गैःस्तुष्टुवाꣳसस्तनूभिः । व्यशेम देवहितं यदायूः ।।

Transliteration

Om Bhadram Karnnebhih Shrnnuyaama Devaah |

Bhadram Pashyema-Akssabhir-Yajatraah |

Sthirair-Anggais-Tussttuvaamsas-Tanuubhih |

Vyashema Devahitam Yad-Aayuh |

Meaning

Om, O devas, may we hear with our ears what is auspicious,

May we see with our eyes what is auspicious and adorable,

May we be prayerful (in life) with steadiness in our bodies (and minds),

May we offer our lifespan allotted by the devas (for the service of God).

This is a mantra from ancient Indian sacred text 'Atharva Veda'. This thesis is inspired by our prayers in which we ask God to give us strength to hear good things, see good things and do good things and that way we enjoy our life bestowed upon us. This research work has evaluated the health services by appreciating the 'good' in the health organization to create an imagined future.

https://en.wikipedia.org/wiki/Shanti_Mantras

Ref: Sharma, R. C. Atharva Veda Samhita. Sayan Bhasya, Kand VI, Mathura; 1928.

CHAPTER 1. INTRODUCTION

Around the world, governments, policymakers, health care providers, and health organizations are working together to offer essential health care to their populations [1]. According to the Declaration of Alma-Ata in 1978, primary health care is "*essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination*" [2]. Primary health care is grounded on the fundamental right to the highest standard of health [1, 3], and it is also a key concept of the World Health Organization's goal for *Universal Health Coverage* and *Sustainable Development* [1]. It serves as a foundation for health systems and enables them to adapt and respond to a complex and rapidly changing world [1].

Primary health care incorporates a multisectoral approach that integrates health-promoting and disease-preventing policies, community-oriented approaches, and people-centered health approaches [1]. Such an integrated approach is essential to sustain as well as continue to make gains in health-related efforts. It has been reported that primary health care services can improve health care outcomes, access to care, and patient satisfaction, and can reduce hospital admissions and lower total health care cost [1, 4-6].

Recent research on primary care has emphasized its role in improving oral health across the population specially for those with poor access to care or with special health care needs, such as elders, those with physical or mental disabilities, racialized groups, as well as Indigenous populations [7-9]. The integration of oral health care within primary health care bridges the gap between dental care and medical care [10, 11], and aims to achieve sustainable improvements in oral health and minimize oral health inequalities across the population [11, 12]. It considers the multifactorial nature of dental diseases and common risk factors for dental problems and other chronic health problems [10, 12].

Several integrated primary oral health care models have been developed worldwide during the last decade [5, 13-17] and countries such as Australia, Canada, New Zealand, and the USA have developed primary health care services specific to Indigenous communities [4, 18]. However, only

a few programs have reported on the outcomes of integrated primary oral health care models and more specifically those that address the oral health care of Indigenous populations [8]. Successful implementation and delivery of Indigenous primary health care programs rely on well-designed, evidence-based, well-resourced primary health care that harmonizes with, and responds to, the Indigenous way of life and the community it serves [4]. Therefore, there is a need for the evaluation of integrated primary health care models in this population which faces significant oral health problems [8, 19]. Monitoring and evaluating primary health care intervention efforts are essential for the health care systems to guide their implementation, to identify challenges and barriers, and to inform health policy decision-makers [1].

Innovative aspect of the research

This project contributes to the pragmatic and empirical insights in improving oral health care service provision for Indigenous people based on a perceived need of an Indigenous health care organization. To the best of our knowledge, this thesis provides a first evidence-based synthesis of integrated primary oral health care programs for Indigenous populations using the Indigenous concept of “two-eyed seeing” that helps to understand the primary oral health care from both Indigenous and Western worldviews.

The evaluation of integrated health services at this Indigenous healthcare organization was done using an innovative collaborative approach, known as “appreciative inquiry.” This approach focuses on core strengths, successes, and aspirations of the organization and uses them to design and build a promising future [20, 21]. This project is the first to use appreciative inquiry in Indigenous oral health and helps to adapt the appreciative inquiry methodology to the Indigenous context by incorporating Indigenous culture and values. Altogether, this thesis provides a platform for optimal development and implementation of integrated primary oral health care models in other similar communities and organizations.

Organization of the thesis

This thesis is structured into five chapters:

Chapter 1 provides an introduction to this doctoral research project including rationale and objectives of the research.

Chapter 2 reviews the literature on Indigenous oral health and oral health care services around the world and in Canada, integration of oral health into primary care, and recent evidence on the oral health care integrated models in various populations.

Chapter 3 introduces and describes the research project methodology including multiple case study, appreciative evaluation methodology, theoretical frameworks, and data collection and analysis.

Chapter 4 includes manuscript-based study results. Manuscript 1 is a scoping review that maps the global literature on the integration of oral health into primary care in Indigenous communities. Manuscript 2 explores the nature and extent of the integration of oral health into primary care in addressing the oral health needs of the Cree communities served by an Indigenous primary health care organization. Manuscript 3 explores patients' perspectives and experiences in regard to integrated oral health care, and manuscript 4 investigates the perspectives of patients, primary health care providers, and administrators within this organization regarding relational continuity.

Chapter 5 summarizes and discusses the PhD thesis findings, strengths, and limitations. This chapter also presents the concluding remarks and future directions for research, practice, and policy.

Rationale and research objectives

1.1 Research rationale

The integration of oral health into primary health care has been identified as a promising approach in addressing oral health and oral health care disparities in Indigenous communities [11, 13, 22]. Despite the evidence of successful integrated primary oral health care models as well as strong recommendations for the implementation of such care, there are few primary oral health care programs implemented around the world [7, 23, 24]. A very few countries such as Canada, Australia, the USA, the UK, and Brazil have policies and programs on integrated care for general and vulnerable populations [8].

Accordingly, the Cree Board of Health and Social Services of James Bay (CBHSSJB) in the province of Quebec in Canada has implemented this approach in its strategic planning to improve health and social wellness for the Cree population [25]. In the year 2004, the CBHSSJB developed its first Strategic Regional Plan 2004–2014 [25]. This strategic plan considered implementing a model for the integrated delivery of health and social services in the Cree communities. The integration of oral health with primary care was one of the specific objectives of this Strategic Planning [25, 26].

The CBHSSJB organization is responsible for the administration of appropriate health and social services for all persons in the Eeyou Istchee Region [25, 27]. Eeyou Istchee / Iiyiyuuschii (the land of the people) is the homeland of the Crees of Northern Quebec. There are in total nine communities with a population over 18,000, namely Waskaganish, Eastmain, Wemindji, Chisasibi, Whapmagoostui, Waswanipi, Nemaska, Oujé-Bougoumou, and Mistissini [28]. In each of the nine communities, the Community Miyupimatiisiuun Centre has a separate dental clinic section where free services are provided by dentists and dental hygienists [29, 30]. Since 2004, no evaluation has been carried out for the CBHSSJB's integrated primary oral health care program.

1.2 Objectives

The general objective of this doctoral research project is to map the evidence on the available integrated primary oral health care programs in Indigenous communities and to evaluate the integrated primary oral health care program at CBHSSJB using appreciative inquiry evaluation methodology.

The specific objectives of the thesis are:

- To systematically map the available programs and their outcomes on the integrated primary oral health care programs in Indigenous communities underpinned by the *two-eyed seeing* concept **(Manuscript I).**
- To explore how and to what extent the integration of oral health into primary care addresses the oral health needs of the Cree communities.

Based on an appreciative inquiry approach [31], the objectives are to:

(1) Discover the strengths of the CBHSSJB's oral health care policies in the integration of services,

(2) Explore the Cree community members' oral-health experiences and their dreams for oral care services, and

(3) Develop recommendations to support planned actions within the communities **(Manuscript II).**

- To explore patients' perspectives and experiences in regard to patient-centered integrated oral health care in a primary health care organization serving a northern Quebec Cree population **(Manuscript III).**
- To explore the perspectives of patients, primary health care providers, and administrators at the CBHSSJB organization regarding barriers and enablers of relational continuity of oral health care integrated within this Indigenous primary health care organization **(Manuscript IV).**

The knowledge derived from this research has the potential to contribute to Indigenous and other vulnerable populations by strengthening primary oral health services and practices and developing relevant policies to foster their oral health equity in a more responsive way. A theoretical and evidence-informed understanding of integrated primary oral health care may also inform the future development of more relevant and meaningful outcome measures for these programs.

CHAPTER 2. LITERATURE REVIEW

In this chapter, we reviewed the literature regarding Indigenous oral health and oral health care services with a focus on Quebec Cree populations. We then briefly describe the concept of integration of oral health into primary health care and review the research studies conducted on primary oral health care and more specifically on the health care organizations serving Indigenous populations.

2.1 Indigenous populations

At the international level, it is difficult to have a single description of Indigenous people. The most cited description for Indigenous communities, peoples, and nations comes from the Martinez Cobo study on the problem of discrimination against Indigenous populations [32, 33]. According to this study, "*Indigenous communities, peoples and nations are those which, having a historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing on those territories, or parts of them. They form at present non-dominant sectors of society and are determined to preserve, develop and transmit to future generations their ancestral territories, and their ethnic identity, as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions and legal system*" [32, 33].

As per the United Nations 2009 fact sheet, more than 70 countries around the world have approximately 370 million Indigenous people [34, 35]. The Indigenous people in Canada include three groups: First Nations, Métis, and Inuit [36, 37]. As of the Canadian Census in 2016, there were 1,673,785 Indigenous people in Canada, representing 4.9% of the total population [36]. According to Statistics Canada in 2016, the Indigenous population had increased by 42.5% in the previous decade, with a growth rate four times greater than that of the non-Indigenous population [36].

"First Nations people" is the largest Indigenous group and includes two-thirds of the Canadian Indigenous population [38]. There are approximately 619 First Nations communities in Canada representing more than 50 Nations and languages [38]. They have historically been living in North America from the Atlantic to the Pacific [38, 39]. They comprise both Status (those are registered

as Indian under the Indian Act of 1876) and non-Status Indians (who identify themselves as Indians but are not entitled to register on the Indian Register) [38, 40]. Most of the First Nations population are living in the western provinces of Canada, with more than 50% (56.7%) residing in British Columbia, Alberta, Manitoba, and Saskatchewan [36, 38]. Twenty four percent of First Nations people are concentrated in Ontario and 9.5% in Quebec, with the remaining 9.6% in the Atlantic provinces and territories. Among those who are registered under the Indian Act, 44.2% live on reserves and 55.8% off reserves [36]. Reserves are a census subdivision legally designated for First Nations, whereas the off-reserve category includes all Canadian census subdivisions except reserves [41].

The Métis evolved from the historical cross-cultural mix of First Nations members and Europeans [39, 40]. They comprise around one-third of the Canadian Indigenous population. According to the 2016 census, they represent 35.1% of the total Indigenous population with a total population of 587,545 [36, 38, 39]. Most of these people are living in Ontario and the western provinces of Canada [36], and they are mostly established in urban and semi-urban regions (62.6%) [36].

The Inuit ("the people" in the Inuit language) are the people of the North American Arctic [36, 37]. In 2016 census, 65,025 people were identified as Inuit [36]. They represent 3.9% of the total Indigenous population of Canada. About 73% of the Inuit people are living in Inuit Nunangat [36], which includes four regions: Inuvialuit (Northwest Territories and Yukon), Nunavik (Northern Quebec), Nunatsiavut (Labrador), and Nunavut [37].

According to the 2016 Canadian census, the total Quebec Indigenous population was 182,890, which represents 2.3% of the total Quebec population [42]. Of this population, there were 50.7% First Nations people, 37.9% Métis, and 7.6% Inuit [42]. The remaining 3.8% include people with multiple Indigenous identities and Indigenous identities not included elsewhere [42]. There are total of 11 Indigenous groups in Quebec that are distributed into three main families: the Algonquian, Iroquoian, and Eskimo-Aleut families [43]. The most populous nation in the Algonquian-language family is the Cree [43]. Their population growth rate is approximately three times higher than that of Quebec, leading to around 50% of the population younger than age 25.

2.1.1 Northern Quebec: Cree First Nation communities of Eeyou Istchee

2.1.1.1 Eeyou Istchee: Geography and regional coverage

Eeyou Istchee (also termed “Iiyiyuuschii”) is the homeland of the Crees of Northern Quebec. The term “Eeyou Istchee” means “the land of the Iiyiyuu/Iinuu [people]” [44]. This land lies on the east coast of James Bay and South-east Hudson Bay [44], and comprises nine communities with a population of nearly 18,000, namely Whapmagoostui, Chisasibi, Wemindji, Eastmain, Waskaganish, Nemaska, Waswanipi, Oujé-Bougoumou, and Mistissini [28, 44]. These communities are administered locally through their local governments, as well as regionally by the Grand Council of the Eeyou Istchee and the Council of the Cree Nation Government [44]. While the distance between these communities is great, they are accessible via roads except the northernmost community of Whapmagoostui that is accessible only by air and water [45].

2.1.1.2 Eeyou Istchee: Culture and language

Cree culture is very rich, unique, and lively. The Crees traditionally led a nomadic life by practicing hunting, fishing, and trapping activities for thousands of years. They have diverse rituals and ceremonies such as sweat lodges, pipe ceremonies, sun dance, and the Walking Out ceremony. Similarly, they have a special interest in art and music. Crees have developed a Land-Based Healing Program to recognize the importance of the land and nature, their culture and language, as well as to encourage the transfer of knowledge across generations [46].

The East Cree language (iiyiyuu ayimuun), a part of the Algonquian language family, is the principal language of the regional government of this territory [47]. This is the prominent language in most of the homes and daily communication within the communities [44, 47, 48]. The East Cree language has two dialects, Northern and Southern [44, 47, 49]. The Northern dialect is spoken in the three northernmost communities, Whapmagoostui, Chisasibi, and Wemindji [47, 49]. The Southern dialect can be further divided into two sub-dialects, Coastal and Inland [47]. The Southern Coastal dialect is spoken in Eastmain and Waskaganish [49]. Finally, the Southern Inland dialect is spoken in Southern James Bay communities: Nemaska, Mistissini, Ouje-Bougoumou, and Waswanipi [47, 49]. Most of them speak English also and some speak French as a second language [47].

2.2 Indigenous health and health care services

The World Health Organization's definition of health is coherent with the Indigenous concept of holistic health [50]. Similarly, the Indigenous concept of health is also consistent with the Ottawa Charter in terms of focusing on the holistic view of health, social justice, equity, empowerment, and participation [51].

The Cree concept "*Miyupimaatisiiun*" (to be alive and well and in good health) also represents the holistic worldview of health within the context of land and cultural traditions [52] and represents an *expression of basic social values in Cree life that encompasses notions of: caring for and nourishing one's family; enjoying life and participating actively in the extended family and community; being responsible for keeping oneself safe and in good health; and remaining strong physically, emotionally, and mentally in order to make a good living for the family* [53].

Although in recent years Indigenous health has been improving in Canada, significant disparities still exist [54]. Presently, Canadian Indigenous people are facing health issues such as lower life expectancy, higher infant mortality rate, epidemic level of diabetes type 2, four times higher diabetes-related health complications, 26.4 times higher rate of tuberculosis, higher rates of people living with HIV, higher rates of youth suicides, and higher rates of diseases related to environmental contamination when compared to non-Indigenous populations [54-56]. Even the disease prognosis is poorer among Indigenous Canadians [57]. Withrow et al. [58] reported in 2017 that the 5-year survival rate for cancer was considerably lower than for their non-Indigenous counterparts in a Census Mortality Cohort followed up from 1992 to 2009. Using the data from Aboriginal Peoples Surveys 2006 and 2012, Wilk et al. [59] identified significantly higher prevalence of unmet health care needs among Indigenous Canadians.

Similarly in Quebec, the health status of the Cree Eeyou population is poorer compared to the rest of Quebec [60]. The Cree population have a lower life expectancy, higher mortality rates for endocrine diseases, a higher injury rate among men, and higher respiratory diseases and oral health problems when compared to the general Quebec population. Hospitalization rates have also been found to be 1.8 times higher than for the Quebec population primarily due to respiratory, digestive, and circulatory problems, injuries, and genitourinary diseases [60].

Health care services for First Nations are covered by Health Canada funds and Non-Insured Health Benefits. For the Inuit, regional or territorial governments provide primary, acute, and specialist care and Inuit health authorities or governments help in providing mental health services, public health, and community health programs. The health services for Métis are covered by provincial health insurance plans similar to other non-Indigenous people, except for Métis Health Benefits Program for the Northwest Territories [61].

In Eeyou Istchee, the *James Bay and Northern Quebec Agreement* was signed in 1975 by the Cree and Inuit peoples of Quebec, the governments of Canada and Quebec, the James Bay Development Corporation, the James Bay Energy Corporation, and Hydro-Québec. As part of this agreement, together with the federal health programs and services, the provincial government of Quebec is also responsible for funding health services and social services [62, 63]. As stated in section 14 of this agreement, the Cree Board of Health and Social Services of James Bay (CBHSSJB) should be responsible for the administration of appropriate health and social services for all the persons in the region [25, 27]. Initially, for the first five years of the agreement, there were health-related challenges including poor health and infectious disease burden, operational and administrative challenges in establishing the CBHSSJB such as lack of experienced staff, challenges in operating new clinics, higher social service demands, and financial difficulties. The services did improve eventually [53]; among the changes were the development of new Cree Social Services Centres in all the communities, construction of the Chisasibi regional hospital, and more health-related programs [53]. As the organization evolved, nine health clinics, nine multi-services centers for elders and people with disabilities, a regional dental department, and regional youth rehabilitation center were established in the entire Eeyou Istchee region [53]. However, as per the Canadian Community Health Survey, *Iiyiyiu Aschii*, published in 2008, 14% of the participants reported unmet health care needs in the year preceding the survey and only 50% of respondents cited good health care availability and quality in their communities [64].

2.3 Indigenous oral health and oral health care services

2.3.1 Oral health status

Presently, Indigenous people around the world have poorer oral health and profound oral health disparities in comparison to their non-Indigenous counterparts [65, 66]. They suffer from remarkably higher rates of untreated dental caries, periodontal problems, inadequate dentition, and poor perceived oral health [65-68].

Findings from multiple oral health surveys and studies in Canada also report oral health disparities among Indigenous peoples compared to Canadians in general (**Table 1**) [69-75].

Table 1. Comparison of oral health indicators from multiple Canadian national surveys

Canadian surveys / **Indicators**	**Canadian Health Measure Survey (CHMS) 2007–09 (among off-reserve Indigenous) [69]**		**Inuit Oral Health Survey 2008–09** [72]	**First Nations Oral Health Survey 2009–10** [71]
	Indigenous	Non-Indigenous		
Coronal caries				
• Preschool children	NA	NA	85.3%	85.9%
• School-age children • (6-11 years)	89.2%	55.2 %	93.4 %	93.9%
• Adolescents (12-19 years)	75.9%	57.7%	96.7%	91.4%
• Adults 20 years and above	97.7%	95.9%	99.4%	99.9%
Root caries prevalence (Adults ≥ 20 years)	NA	20.5%	44.3%	32.9%
Edentulous (Adults ≥ 20 years)	NA	6.4%	9.7%	6.3%

Gingivitis (Adults ≥ 20 years)	NA	32.2%	30.6%	43.9%
Periodontitis with Pocket Depth (≥ 4 mm) (Adults ≥ 20 years)	NA	20.2%	16.5%	23.0%
Periodontitis with Loss of Attachment (≥ 4 mm) (Adults ≥ 20 years)	NA	21.2%	17.0%	16.8%
Dental visit in the last year	71.6%[#]		56.8%	49.8%

*NA: Not Available; [#] Combined prevalence for both non-Indigenous and Indigenous living off reserve

The Canadian Health Measure Survey (CHMS) 2007–09, Inuit Oral Health Survey 2008–09 and First Nations Oral Health Survey 2009-10 report higher prevalence of dental caries among all the age groups of Indigenous communities with > 85% prevalence in preschoolers, > 76% in adolescents, and > 98% in adults [69-72]. Comparison of caries prevalence among 6- and 12-year-old Indigenous children in the First Nations Oral Health Survey 2009–10 with 20-year-old data from the first oral health examination survey in 1990–91 indicates no improvement in caries prevalence and severity among 6-year-olds and just 9% decrease among 12-year-olds [71].

Concerning periodontal status, 43.9% of respondents were affected by moderate or severe gingivitis and 23.0% by periodontitis with a periodontal pocket depth greater than or equal to 4 mm [71]. Periodontal treatment needs were higher in remote First Nations communities (83.5%) compared to those living in non-remote areas (76.9%) [71]. Food avoidance due to oral problems was noted as more than three times higher among First Nations (39.7%) and about two and a half times higher among Inuit (30%) compared to non-Indigenous Canadians (11.9%) [71, 72]. Such high prevalence of dental problems is also associated with low oral-health-related quality of life among Indigenous people [68]. These surveys also reported that more than half of Indigenous people did not have dental visits in the past year [70-72]. This can be explained by long travel distance to reach a dental clinic and shortage of dental workforce in these areas [71, 72, 76]. Nearly 46% of First Nations people in remote areas are unable to afford the costs of transportation for accessing dental care [71].

Nevertheless, according to the three phases of the First Nations Regional Health Survey (RHS) (Phase 1 in 2002–03, Phase 2 in 2008–10, Phase 3 in 2015–16), overall positive trends were observed since Phase 1 in oral health indicators such as prevalence of early childhood caries, dental pain, tooth loss and denture wear, and access to dental care for those living on reserves and in Northern communities [77].

Likewise, multiple cross-sectional survey studies stated higher prevalence of dental caries among Indigenous children. For example, in 2004, Peressini et al. [78] reported 52% dental caries among 3- and 5-year-old First Nations children in Ontario; Schroth et al. [79] in 2005 reported 53.7% of early childhood caries among First Nations and disadvantaged children under 6 years of age in Manitoba; and in 2008, Leake et al. [80] identified 66% caries among children aged 2–6-years in the Inuvik Region in the Northwest Territories of Canada. In line with this, the baseline data of a community-based randomized controlled trial by Lawrence et al. [81] in 2008 showed significantly higher caries prevalence and severity among Indigenous children in Ontario compared to non-Indigenous children. In a survey conducted in Manitoba in 2012, Blanchard et al. [82] reported poor oral health outcomes, poor oral hygiene, and more smoking among First Nations compared to the Caucasian group. Parents of children with severely affected early childhood caries reported poor oral-health-related quality of life due to pain and difficulty in chewing [80].

Oral health disparities between off-reserve First Nations and non-Indigenous populations have also been identified [71, 83]. Conforming to this, in 2009, Lawrence et al. [84] conducted a study by collecting cross-sectional data over a period of three years between 2003–05 and reported oral health disparities between both groups. The First Nations pre-school children living off-reserve had 2.9–3.5 times higher risk of developing severe early childhood caries as well as 1.8–2.5 times higher risk for untreated carious teeth compared to their non-Indigenous counterparts [83, 84]. Furthermore, disparities in oral health were also noticed between on-reserve and off-reserve First Nations people [83, 84]. According to Lawrence et al. in 2009 [84], the decayed, missing, and filled teeth index (dmft) score for 4-year-old on-reserve First Nations children was 11.2 compared to that of off-reserve children whose dmft score was 5.9 [84].

Recently, Mehra et al. analyzed the data from the 2014 cycle of the Canadian Community Health Survey and highlighted poor dental service utilization among Ontario's Indigenous people: 28%

of participants reported visiting dentists only in emergencies [85]. Moreover, the rate of hospital admissions related to dental problems, especially for treatment under general anesthesia, is also very high among Indigenous populations [68]. Most cases of early childhood caries are treated under general anesthesia which is often done away from their communities in urban centers. In such cases, these children are accompanied by their parent or guardian to travel for their treatment [77]. According to a national review of Canadian data by Schroth et al. [86] in 2016, the burden of day dental surgeries for children with early childhood caries in regions with high proportion of Indigenous children is 7.8 times greater than in areas with lower proportion of Indigenous children.

With regard to the oral health status of Cree Communities of Eeyou Istchee, the report on Cree Dental Health in Eeyou Istchee in 2001 cited higher prevalence of dental caries among all age groups [87]. For instance, permanent and deciduous dentition Decayed, Missed, Filled Surface index (Dmfs/DMFS) scores for 1–2 years, 4–5 years, 7–8 years, and 11–12 years were respectively 8 times, 5 times, 4 times, and 3 times higher compared to those of the general Quebec population [87].

As per the *Étude clinique sur l'état de santé buccodentaire des élèves québécois du primaire* (ÉCSBQ) – Eeyou Istchee 2012–2013, the proportion of Grade 2 and Grade 6 students with at least one decayed, missing, or filled deciduous and permanent tooth respectively were pretty much similar to the proportions in 1983, 1991, and 2001. Moreover, the gap of this proportion between Eeyou Istchee and Quebec has significantly increased from 1983 to 2012. The average score for decayed, missed, filled teeth index for deciduous teeth (dmft) for 2nd grade students has reduced from 8.0 to 6.95 since 1983 for Eeyou Istchee and from 4.41 to 2.45 for Quebec students. However, the gap in this average between Eeyou Istchee and Quebec still remains the same. In contrast, the DMFT index score (permanent teeth) for Grade 6 students has increased from 5.18 in 1983 to 5.60 in 2012. This score is inverse to that of Quebec students where this number has significantly reduced from 3.81 in 1983 to 0.93 in 2012. This difference creates a significant gap for DMFT score between these two groups [88]. The evident treatment needs for 2nd and 6th grade students were also high (74.7% and 70.2% respectively) compared to those of other Quebec students (17.2% and 10.5% respectively) [88].

The Canadian Community Health Survey, Eeyou Istchee, in 2008 reported comparably positive perception about dental services in the region [64]. Nearly 50% had a dental visit in the past year; however, reasons for not seeking dental care from those who have not visited the dentist in the past couple of years include long waiting lists and feeling that no dental treatment was required [64]. This point is suggestive of lack of awareness among most community residents where they believe that dental care is only needed in emergencies [34]. Differences in health and oral health service utilization were also noticed between people in the inland communities and coastal communities, with service utilization being higher in inland communities [34]. In 2013, Girard et al. [89] reported unmet community needs and dissatisfaction among local people in a Cree community towards dental services. The participants desired quick access to dental services in case of emergency, culturally competent oral health professionals, and home-based dental counselling and support for the elderly [89].

Nevertheless, historically Indigenous people had good oral health as indicated in the study of Ritchie [90] in 1923 that found no cavities within 34 skulls received from the 1913–28 Canadian Arctic Expedition. Similarly, the Mayhall study [91] in 1977 examined 301 skulls from 900–1650 AD and found that only two showed dental caries (0.66%). This increase in the prevalence of dental problems has been correlated with the modification in lifestyle of Indigenous populations and adoption of western dietary habits [92, 93]. It has also been ascribed to socio-economic, cultural, and environmental factors such as non-availability of fluoridation of drinking water, especially for those living in rural and remote areas [92, 94]. Therefore, the persistent oral health disparities of Indigenous communities can indeed be attributed to the social determinants of oral health.

2.3.2 Social determinants of Indigenous oral health

According to a glossary for social epidemiology, *"the social determinants of health refer to both specific features and pathways by which societal conditions affect health and that potentially can be altered by informed action*" *[95].* "*These determinants include the conditions in which people are born, grow, live, work and age – conditions that together provide the freedom people need to live lives they value*" [96].

Various frameworks have been used to explain Indigenous health disparities. In 1998, the Four Worlds International Institute for Community and Human Development developed the First Nations–derived 14 Determinants of Health model [97]. This model was inspired from Indigenous worldviews and included Indigenous-specific health measures such as spirituality and a sense of purpose, adequate power, social justice and equity, cultural integrity and identity, and community solidarity and social supports [97]. In 2000, the framework of socioeconomic health determinants by published by Turrell and Mathers [98] categorized social determinants into three groups including upstream (macro), midstream (intermediate), and downstream (micro) factors. This model was later adapted and used by the Australian Government to describe the Indigenous health disparities in Australia [99].

Later, in 2003, Ansari et al. developed a public health model of the social determinants of health [100] that classified determinants of health into four groups: social determinants, health care system attributes, disease-inducing behaviors, and health outcomes. This model has also been used in describing Australian Indigenous disparities [101]. Then in 2010, Solar and Irwin [102] developed a conceptual framework for the Commission on Social Determinants of Health promoted by the WHO. This model grouped social determinants of health into structural determinants that focus on context, structural mechanisms, and socioeconomic position, and intermediary determinants that include material circumstances, behavioral and/or biological factors, psychosocial factors, and the health system [102].

2.3.2.1 Integrated Life Course and Social Determinants Model of Aboriginal Health framework

The Integrated Life Course and Social Determinants Model of Aboriginal Health Framework was introduced by Reading and Wien in 2009 [103]. This model represents the direct impact of Indigenous contexts and social determinants on health as well as their interaction with each other on health [103, 104] (**Figure 1**). The model shows a holistic concept of health across the life course of Indigenous people. The concept of holistic health comprises physical, mental, emotional, and spiritual dimensions of health and wellbeing as well as their interrelationship [103].

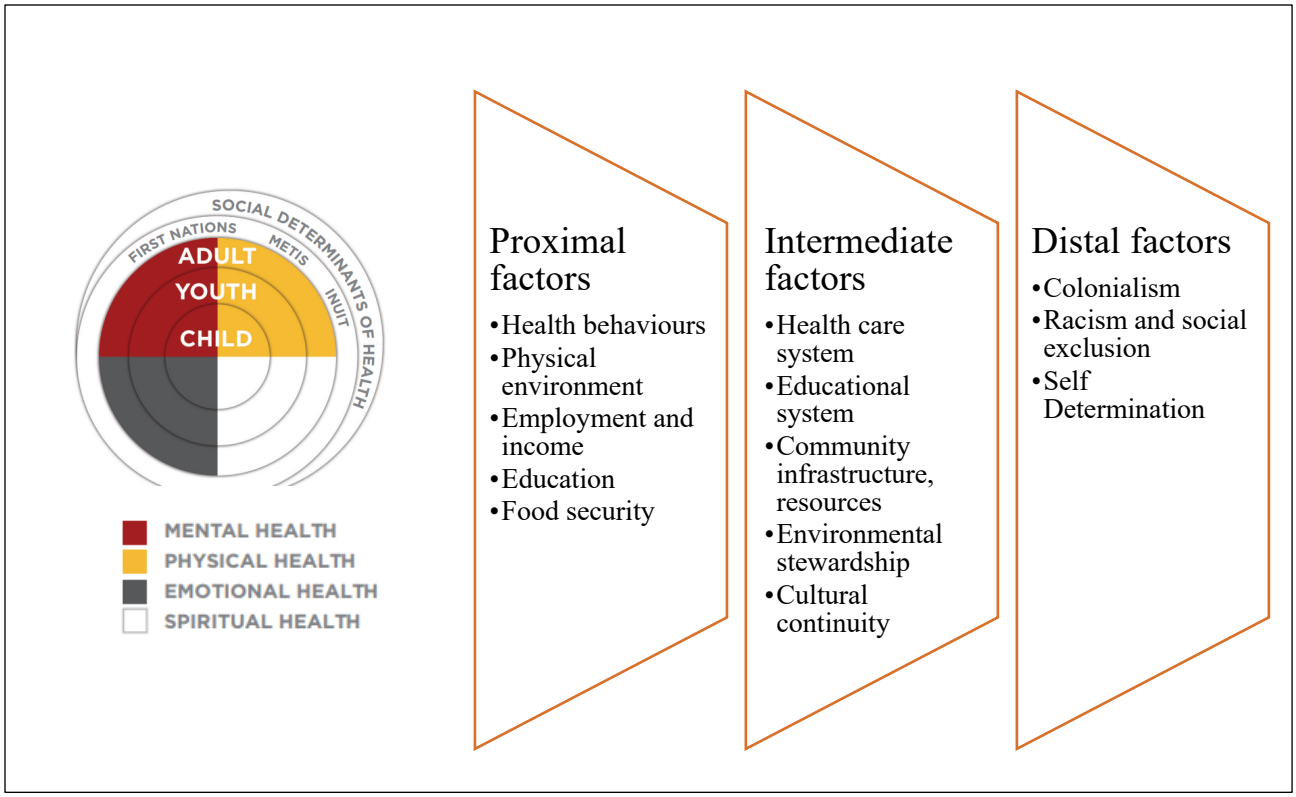

Figure 1. Integrated Life Course and Social Determinants Model of Aboriginal Health Framework. (Adapted from: Reading CL, Wien F, Health inequalities and social determinants of Aboriginal people' health, 2009.)

Reading and Wein classified the broad range of social determinants into proximal, intermediate, and distal factors. Proximal determinants directly influence an individual's holistic health and include health behaviors, education, income, and food security. Intermediate determinants affect the environment and conditions where the individual lives. These include health care systems, educational systems, community infrastructures, resources, environmental stewardship, and cultural continuity [103, 104]. Lastly, distal determinants surround both intermediate and proximal determinants through political, social, and economic contexts. The examples of distal determinants are colonialism, racism, and social exclusion, as well as self- determination [103, 104]. This framework has been used in numerous studies and health surveys such as the Aboriginal Peoples Survey, conducted in Canada in 2012 [105].

Various research studies have indicated to the role of social determinants in the oral health of Indigenous Canadians [71, 79, 80, 82, 93, 106-110]. Most of the proximal determinants of oral

health for Indigenous people are consistent with the established oral health determinants for general populations [79, 80, 82]. For instance, high prevalence of dental caries in Indigenous children has been associated with poverty, large family size, lower parental education, and parental employment status in case of early childhood caries [79, 82, 106, 107]. Several studies and surveys among Indigenous children have shown that unhealthy diets such as daily consumption of sugar, soft drinks, fast food, and sweets are important risk factors for dental caries, similar to general populations [71, 80, 107, 108, 110]. Likewise, early childhood caries has been also found to be associated with parental smoking behavior [82, 106, 110]. A study conducted by Schroth et al. [107] in 2013 in Manitoba reported that First Nations children whose mothers had smoked during pregnancy had 1.7 times greater risk of severe early childhood caries. This study also showed that unavailability of health services and lack of culturally appropriate services were significant intermediate determinants of dental caries among these children [107].

Distal factors such as colonization, assimilation, and racism have been shown to adversely affect the oral health of Indigenous people [93, 109]. In a review conducted by Parker et al. [93] on the oral health of Indigenous people in Australia, New Zealand, Canada, and the United States, colonization was identified as the source of oral health disparities between Indigenous and non-Indigenous children. Furthermore, Lawrence et al. [109] in 2016 analyzed self-reported racism among pregnant Indigenous women in the baseline data of a randomized controlled trial of two Canadian provinces. This study revealed experience of racism among approximately one-third of the participants in multiple settings such as work environment, health care system, academic setting, governmental settings, and other public places [109]. The experience of racism was found to be significantly associated with factors such as receiving dental care off-reserve and being asked to pay for dental services during the dental visit, fear of going to the dentist, need for preventive dental care, and poor oral-health-related quality of life [109].

2.3.3 Oral health care services

Indigenous people typically have access to dental care through public and private dental services [92, 111, 112]. Private services are primarily funded by out-of-pocket payment or employment-based insurance [92, 112].

In Brazil, in 1999, the Unified Health System developed the Indigenous health care subsystem to improve the Indigenous population's health and oral health care [113]. Several other governmental health care organizations such as Indian Health Services in the United States, First Nations and Inuit Health Services in Canada, Aboriginal Community Controlled Health Services in Australia, and Māori health providers in New Zealand have also been developed to provide better oral health care services to Indigenous populations [18, 111, 114].

In the United States, federal and state governments provide oral health and dental services to Indigenous people via programs such as Medicare, Medicaid, and the Children's Health Insurance Program [115]. The Australian government also provides services to Indigenous people through public programs including Child Dental Benefits Schedule, school dental services, and mobile dental clinics [92, 116]. The Australian government also provides funding for dental services at Aboriginal community-controlled health services [92]. In New Zealand, publicly funded oral health services for Indigenous people are mainly provided through district health boards and contracted dental providers [117].

In Canada, the federal government provides financial support to promote oral health of First Nations and Inuit communities [112]. The government also supports them via various programs such as the Non-Insured Health Benefits Program (NIHB), Children's Oral Health Initiative (COHI), and Dental Therapy Program [76]. However, there are discrepancies in coverage of the cost of dental care amongst the provinces and territories [112]. The NIHB Program offers coverage for diverse essential medical benefits including dental care [118]. As per the British Columbia Tripartite Agreement in 2011, First Nations Health authority undertook the responsibility for the provision of health care to the First Nations in British Columbia [118]. In this province, the NIHB Program has been replaced by the First Nations Health Authority Health Benefits Program since 2013. In the year 2018–19, the gross expenditure on dental benefit claims amounted to 19.3% of the overall NIHB expenditure, which represents the third largest expenditure [118].

Another program is Children's Oral Health Initiative (COHI) launched by Health Canada in 2004 [83, 119]. This community-based preventive program aimed to reduce the prevalence of dental caries in First Nations and Inuit children living on reserves [119]. The program targeted preschool

children, school children aged 5–7 years, parents/primary caregivers, and pregnant women [119]. In this program, preventive and promotive dental services are offered by dental therapists, dental hygienists, and community health worker (COHI aide) [83, 119]. Furthermore, the dental therapy program offered essential dental services such as fillings, extraction, and preventive treatments in areas with limited access to dental services, in particular for First Nations and Inuit populations [120]. However, this program was closed in 2011 [120].

For the registered Métis people of the Northwest Territories, the Government of the Northwest Territories offers the Métis Health Benefits program. This program provides coverage for a range of benefits including prescription drugs, dental care, vision care, medical supplies and equipment, medical travel, and ambulance services [121].

In several countries, additional strategies have been introduced to improve the oral health of Indigenous people and their access to oral health care services. These strategies include appointing Indigenous health workers; outreach training programs; and integration of Indigenous traditional practices in health care [68, 111, 122]. Indigenous health workers play an important role in delivering culturally appropriate oral health service in Indigenous communities [68, 111, 123-125]. Examples of Indigenous health workers include trained dental health aide therapists in Alaska [111], community oral health specialists in the United States [126], Aboriginal health workers in Australia [125, 127, 128], and COHI aide and community health representatives in Canada [119, 129].

Since 2002, the outreach training programs in Indigenous communities have been included in the dental curriculum in the United States, Canada, Australia, and New Zealand [111, 130]. Moreover, dental schools have offered an explicit enrolment quota for Indigenous students in some countries like Australia and New Zealand [113]. Finally, the integration of Indigenous traditional and cultural practices into oral health care and use of adapted oral health promotion aids have been shown to be effective in terms of improving the oral health of Indigenous populations [111, 131, 132].

All the above mentioned oral health disparities within this complex intersection and interrelation of health determinants need to be broadly tackled by system-focused collaborative approaches such as an integrated care approach [133].

2.4 Integration of oral health care into primary health care

The integration of oral health care into primary health care has been proposed as a strategy for addressing oral health disparities [11, 13, 22]. In 1978, the WHO identified primary health care as a driving force towards integrated and coordinated health care services [2]. The primary health care concept underpins the principles of prevention, equitable distribution of health care, community involvement, appropriate technology, and a multi-sectorial approach [15]. According to Starfield [134], the four key elements of primary health care include first-contact, continuous, comprehensive, and coordinated care. Definition and principles of primary care also entail intersectoral linkages between health and social care and espouse an integrated care viewpoint [135-137].

Aging population, higher prevalence of people diagnosed with chronic diseases and multimorbidity, imbalance between the growth dynamics of the health care systems and the economic pressure on governments, health systems challenges in providing continuous and efficient care, as well as the population's rights and expectations of having free and equal access to care have forced health care systems to move forward integrated care [135, 138, 139].

The integrated care concept is widespread, and the myriad terminologies and concepts linked to integrated care suggest "*the polymorphous nature of integrated care*" [140, 141]. This multidimensional nature of integrated care corresponds to distinct contexts and perspectives of integrated care initiatives [140, 141]. Various terminologies have been used interchangeably with integrated care, such as managed care, seamless care, shared care, coordinated care, collaborative care, and transmural care [139, 140, 142].

In general, integrated care terminologies can be categorized into health-system-based, process-based, manager-based, and user-based definitions [143-145]. The process-based definition is more popular than the others and defines "*integration as a coherent set of methods and models*

on the funding, administrative, organizational, service delivery and clinical levels designed to create connectivity, alignment and collaboration within and between the cure and care sectors. The goal of these methods and models is to enhance quality of care and quality of life, consumer satisfaction and system efficiency for people by cutting across multiple services, providers and settings. Where the result of such multi-pronged efforts to promote integration lead to benefits for people the outcome can be called 'integrated care'" [142, 144].

Furthermore, in the literature the dimensions of integration have been discussed and classified into various categories [136, 142, 146-148]. These include clinical, organizational, professional, system, functional, and normative integration [136]. Clinical integration is defined as "*integration of care by professionals and providers to patients into a single or coherent process within and/or across professions, such as through use of shared guidelines and protocols*" [118, 123, 125]. Organizational integration is defined as "*integration of organizations through mergers and coordinated provider networks*" [142, 146, 148]. Professional integration corresponds to the extent to which professionals coordinate services across several disciplines [136]. System integration is concerned with "*coherence of rules and policies at organizational levels*" [136]. Functional integration is "*integration of non-clinical support and back-office functions, e.g. electronic health records*" [136, 142, 146, 148] and normative integration is related to "*shared values and commitment to coordinating work*" [142, 146, 148].

Integrated care is also classified as horizontal and vertical integration [136, 142]. Horizontal integration of care strategies link similar levels of care whereas vertical integration strategies link different levels of care [136, 142]. Furthermore, integration can be categorized as micro, meso, and macro depending on the level of integration [142]. At the micro level, care integration is targeted at individuals; at the meso level, integrated care is targeted at disease and population groups; and at the macro level, care is targeted at the whole population [142]. Integration is also classified on the basis of time span as integration for a specific episode of care, e.g., for acute conditions and hospitalization, and integrated care for life-course approach, for example for chronic conditions [142].

To better understand the components and processes of integration, different models of integration have been introduced in the past two decades [142, 148, 149]. In 1999, Leutz suggested that integration has three levels. These include linkage, coordination, and full integration [148, 149]. Later, in 2005, Ahgren and Axelsson modified Leutz's model by adding two more levels of integration [149]: full segregation before linkage, and co-operation between coordination and full integration [149].

In the review conducted by Leatt et al. in 2000, six steps were identified in the implementation process of integrated care [150]: 1) focus on the need and preferences of individuals and families, 2) start with primary healthcare, 3) share information and exploit technology, 4) create virtual coordination networks at local levels, 5) develop practical funding opportunities, and 6) implement mechanisms to monitor and evaluate the care [150].

2.4.1 Integrated primary health care in Quebec and Canada

In Canada in the mid-1990s, health care policy-makers started considering integrated care to control health care costs [150]. By the end of the 1990s, most of the Canadian provinces had implemented some form of integrated care in the regional health care systems [150].

In Quebec, integration of health and social services was one of the strategies to improve health care delivery [151]. Accordingly, since 1971 Quebec has developed integrated care under a single ministry of health and social services by merging primary health services, social services, and home care via CLSCs (*Centre local de services communautaires*) [151]. In 2004, Quebec implemented a major structural health care reform. This reform was based on two key principles: a shift from a service-based approach to a population-based approach built by merger, and prioritization of services by improving the referral mechanisms between primary, secondary, and tertiary level of services [151].

In this reform, 94 Health and Social Service Centres (*Centres de santé et de services sociaux*) were developed by merging CLSCs, local community health centers, long-term care facilities, and some acute care hospitals [152]. Later, new primary care models were implemented to promote family physician group practices such as family medicine groups and network clinics, as well as

local health networks. These family physicians' practices enhanced the integrated health care delivery via collaboration with primary health care organizations [152].

In 2015, the health and social service system underwent another reform which led to the development of 22 functional units called Integrated Health and Social Services Centres/Integrated University Health and Social Services Centres [152]. These functional units were established by merging the Health and Social Services Centres with other public healthcare organizations including rehabilitation centers, youth centers, as well as university teaching hospitals in defined regional territories [152]. Not all Aboriginal and Northern communities are covered by this act, including Cree communities, Inuulitsivik, Naskapi, and Tulattavik De L'ungava [153]. They have their own service administration; for instance, the Cree Board of Health and Social Services of James Bay offers them services in Quebec Cree communities [154].

These reorganizations were inspired by research work on integrated care models in Quebec including community-based integrated services. Examples of such services include PRISMA *(Program of Research to Integrate the Services for the Maintenance of Autonomy)* and SIPA (*Services intégrés pour les personnes âgées*) which provide multidisciplinary care services to elders with disabilities [151, 155]. Reports on evaluations of these models showed positive outcomes including better collaboration and coordination among health professionals, access to primary care, continuity of care, patient satisfaction, patient–care provider communication, long-term patient management, organizational accountability, and job satisfaction [151, 152, 156].

2.5 Integrated primary oral health care

Primary oral health care is an essential part of primary health care. Primary oral health care is defined as "*the integration of services that promote and preserve oral health, prevent oral disease, injury and dysfunction and provide a regular source of care for acute and chronic oral diseases and disabilities.* Primary oral health care *serves as the usual entry point into the larger oral health system and takes responsibility for assuring the coordination of oral health services with other health and human services*" [157, 158].

2.5.1 Integrated primary oral health care models

2.5.1.1. History: Policies, strategies, action plans

In 2000 the US Surgeon General's report recommended the integration of oral health care into general health [22]. Later, in 2003, the National Call to Action to Promote Oral Health by the U.S. Department of Health and Human Services also proposed integration of oral health care into general health care services as one of its guiding principles [159]. In the same year, the WHO's World Health Report recommended the integration of oral health into public health programs at the national and community level [13, 160]. In 2007, the 60th World Health Assembly developed an action plan to incorporate oral health promotion and prevention into chronic disease programs [12, 161]. Then in 2012, the FDI World Dental Federation's "Vision 2020" also highlighted the integration of oral health into overall health policies at local, regional, national, and international levels [162]. Later on, the WHO global action plan 2013–2020, in line with the principles of the common risk factors approach, introduced integrated approaches for the prevention and control of noncommunicable disease including oral diseases [163]. Afterwards, in 2014, the Canadian Academy of Health Sciences highlighted the role of integration of oral health care into primary health care for vulnerable groups [112]. Recently, the Lancet oral health series in 2019 also emphasized integrating oral health services into primary health care services [164].

Several integrated primary oral health care models have been developed worldwide, such as the oral health care delivery framework introduced by the American Academy of Family Physicians, the US Oral Health Strategic Framework 2014–2017, Smiling Brazil program, Infant Oral Care Program, Kids Get Care, Into the Mouth of Babes, and the Colorado Medical-Dental Integration project [5, 7, 11, 13-17, 165, 166].

2.5.1.2. Integrated oral health care models

Based on the literature [7-10, 24, 167], integrated oral health care models have been categorized into population-based and group- and disease-specific models of integrated care [142].

i. Population-based integrated models

In this approach, the health care system focuses on the health and wellness of the entire population [168]. A few examples of population-based integrated models include oral health delivery systems in Iran, Brazil, the United Kingdom, and Portugal [8, 169-172].

In Iran, dental care providers were integrated into the national primary health care network in 1997 [170, 173]. Accordingly, in this country the dental care is provided at four levels. At level one, auxiliary health workers (called *behvarzes*) at Health Houses perform oral health education, examinations, referrals, and follow-up for the target populations in rural areas. At the second level, oral hygienists and dentists provide basic oral health care at Rural Health Centers as well as supervising *behvarzes* in the same jurisdiction [170]. At the next level, dentists perform tertiary dental treatments at Urban Health Centers and at the fourth level dental specialists provide advanced dental treatments at University Health Centers [170]. Furthermore, dental health is integrated into public health programs such as programs for maternal and childcare, and school health programs. These programs integrate primary health care workers, including midwives, family health physicians, and rural healthcare workers as well as school health technicians and volunteer teachers for oral health education, screening, and referrals [170, 173].

In Brazil, the Smiling Brazil program was implemented following the Unified Health System in 2004 [8, 171]. In this program interdisciplinary teams including medical doctor, nurse/assistant, dentist, dental hygienist, assistant, and community health agents collaborate for health promotion and disease prevention [171]. According to the literature, this program has been successful in providing sustainable population-based oral health care [8, 171]. However, the program has faced challenges such as economic constraints and resistance from the private sector [8, 171].

In the United Kingdom, under the National Health Service dentistry, primary dental services are provided by general dental practitioners and dental auxiliaries including dental hygienists, dental

therapists, and dental nurses [169]. As per the Health and Social Care Act 2012, dental professionals collaborate with multiple stakeholders, local authorities, and Health and Wellbeing Boards to ensure quality and continuity of care throughout public and private sectors [8, 174, 175]

Recently, Portugal has integrated oral health into primary health care under the National Program for the Promotion of Oral Health [172]. In this program, dentists are appointed to health centers. Initial oral screening is provided by local general practitioners and in case of need, they refer the patient to a dentist in the health care center [172].

ii. Group- and disease-specific models of integrated care

These integrated care models target individuals or communities who are at high risk for oral diseases including rural and remote populations, children and pregnant women, the elderly, people with disabilities, and low-income populations [8, 142].

Within primary health care, three types of services are provided : 1) preventive dental services by medical providers, 2) preventive dental services by dental providers in non-dental settings, and 3) preventive health services offered by dental providers [9].

1) Provision of preventive dental services by medical care providers [9]

The American Academy of Pediatrics and the US Preventive Services Task Force recommended preventive oral health care during the well-child visit [9]. In US states, Medicaid coverage is available for fluoride varnish application on young children's teeth by primary health care professionals [9, 17]. Another example is Into the Mouth of Babes program in North Carolina that started in 2001 and provides preventive dental care to preschool-aged low-income children by medical professionals [176]. These medical professionals are reimbursed by Medicaid [176]. Similarly, some federally qualified health centers, such as Bluegrass Community health center, Holyoke health center, and Dorchester House multi-service center, include trained non-dental primary care staff to provide oral health care screening, risk assessment, and preventive interventions [177, 178].

2) Provision of preventive oral health care services by dental providers in non-dental settings [9]

This model includes several federally qualified health centers in the USA, such as Grace Health in Michigan, Salina health center in Kansas, and Salud health center in Colorado [9, 177]. These centers have embedded dental hygienists in the primary care team to provide oral health screening, education, prophylaxis, and referral in co-located health clinics during the health care appointment [9, 177]. These dental hygienists act as a link between the medical and dental clinics [177]. Another example is the Colorado medical-dental integration project that was launched in 2014 by Delta Dental of Colorado Foundation. Under this project, dental hygienists provide preventive dental care in co-located health clinics such as federally qualified health centers within the region, clinics for vulnerable populations, school-based health clinics, not-for-profit practices, and private pediatric practices [9, 17].

Similarly, in Australia, examples include the Senior Smiles program for residential aged care facilities, introduced in 2013, and a program for "people who inject drugs" in 2018 [179, 180]. These programs involve dental hygienists and assistants to perform oral health risk assessments, to develop individualized oral healthcare plans, and to provide referrals for those in need [179, 180].

Dental hygienists and oral health therapists use telehealth technology to provide preventive early interventions and referrals in nontraditional settings such as schools, nursing homes, or other community agencies [181-184]. For instance, the "Virtual dental home" program in California and the "SMILES Dental Project – Spanning Miles in Linking Everyone to Services" program in Colorado use telehealth technology in the USA, while a program for residential aged care facilities in Queensland, Australia in 2014 used telehealth technology for preventive care and referrals [181-184].

3) Preventive health services provided by dental providers [9]

A few accountable care organizations, federally qualified health centers, and private group practices in the USA have used a medical-dental integration model in their health care organization. In these centers, dentists participate in primary health assessment of patients at risk for diseases such as diabetes and refer them to the medical provider if necessary [9, 178].

The integrated care in such models has been reinforced via multiple strategies, such as interprofessional education and training, care coordination and cross referrals, and co-location of primary and dental care providers. Various organizations in the United States such as Neighborcare Health, Dorchester House multi-service center, and Terry Reilly health services have developed oral health training modules for physicians [166, 178]. In 2014, the "Caring for Kids Where They Live" program was developed at University of Saskatchewan [185, 186]. In this program, trained third-year nursing students performed oral health assessments, education, and referrals for school children [185, 186]. Similarly, the Harvard School of Dental Medicine in 2016 initiated cross-training of DMD students and nursing students [187].

2.5.2 Evaluation of integrated primary oral health services

Program evaluations are necessary to strengthen primary health care and to improve the performance and cost-effectiveness of health systems [188]. Such evaluations are considered an important component of health service management and a feedback tool for quality improvement [189].

Numerous theoretical models, conceptual frameworks, and questionnaire tools have been used to evaluate primary health care services. The Donabedian quality of care model has been widely used in many research studies [190]. This model illustrates the effect of structure and organization of the health care system on health care processes and health outcomes [190].

The WHO's quality of care model (**Figure 2**) introduced six key interrelated domains to measure the quality of a health system. These domains include: 1) leadership, 2) information, 3) patient and population engagement, 4) regulation and standards, 5) organizational capacity, as well as 6) models of care [191]. Strong leadership at the national and community level, as well as by health organization leaders, plays an important role in achieving better health outcomes [191]. Furthermore, an effective and transparent information system is important to measure and compare the change in processes and outcomes [191]. Organizational capacity is related to the ability of the organization to develop systems that support quality improvement [191]. Finally, the

model of care is defined as best practices for health care delivery [191].

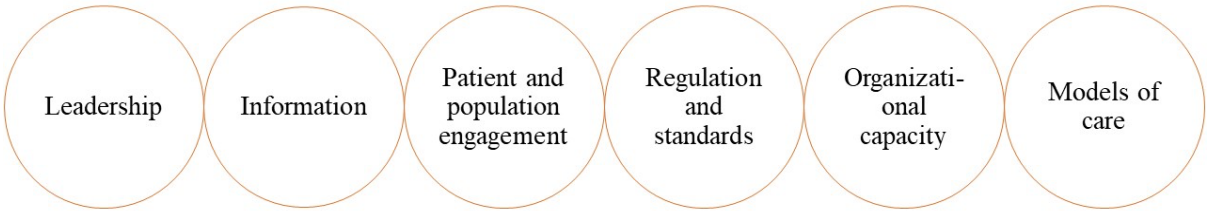

Figure 2. World Health Organization quality of care model. (Adapted from World Health Organization. Quality of care: A process for making strategic choices in health systems. Geneva, Switzerland: World Health Organization, 2006) [191]

The Rainbow model of integrated care was developed by P. Valentijn in 2015. This model enables a comprehensive understanding of the diverse aspects of integrated primary health care and their interaction [135]. The dimensions of the model are based on the level of integration: the macro level incorporates system integration, the meso level includes organizational and professional integration, and micro level incorporates clinical integration [135, 136]. Functional and normative integration ensure connectivity between the three levels of the integrated care system [135, 136]. Rainbow model questionnaires have been developed and validated for patients and care providers in multiple languages [192]. In 2013, the Canadian Nurse Association, the Canadian Medical Association, and Health Action Lobby collaboratively developed and introduced a five-foundations model of integrated care. The five foundations include patient access, patient-centered care, informational continuity of care, management continuity of care, and relational continuity of care [193]. Both the Rainbow model and the five-foundations model are described in detail in chapter 3.

Since the late 1990s, various questionnaires have been developed and validated to evaluate primary health care [189, 194, 195]. These tools are variable and heterogenous in nature and mostly have been used for specific health care programs within primary health care [189]. For example, in 2000, Cassady et al. developed and validated the Primary Care Assessment Tool (PCAT) [195]. This tool is designed based on four major characteristics of primary care: first-contact, continuity

of care, comprehensiveness, and coordination [195]. Later, in 2010, the WHO developed the Primary Care Evaluation Tool (PCET) [188] which includes three questionnaires addressed to administrators, doctors, and service users [194]. These questionnaires contain questions on primary health care functions including stewardship, financing and incentives, resource generation, and primary care delivery [188].

2.5.3 Outcomes of integrated primary oral health care

Every integrated primary oral health care model has its success stories and challenges [8]. Harnagea et al. conducted a comprehensive review on models and programs of integrated primary oral health care around the world [7, 8, 24]. They reported that these programs have been successful in implementing integrated primary oral health care in terms of improving oral health outcomes, access to dental care, patient satisfaction, dental visits, screening and prevention of oral diseases, referrals for complex treatment needs, and patient management, as well as reducing patients' non-attendance [8]. Integrated primary oral health care also helped in building a supportive environment by improving interprofessional collaboration and satisfying non-dental primary care providers in providing preventive dental services [8, 179, 183, 185].

According to Safety Net Medical Home Initiative in 2016, oral health integration in various US primary care practices resulted in an increased number of oral health preventive services and referrals, improved patient care, care coordination, and opportunities to improve care processes [196]. Atchison et al. in 2018 performed an environmental scan of integrated primary oral health services in the USA and discussed four case studies [9]. These case studies also demonstrated better access to care, interprofessional consultations, care coordination, as well as referral and navigation [9].

Facilitators of integration

Numerous review articles, original studies, and reports have also reported on multiple facilitators and barriers to integrated oral health care [7, 9, 167, 173, 197-199]. In 2017, Harnagea et al. conducted a scoping review that identified several facilitators of integration of oral health into

primary health care including supportive policies and resource allocation, interdisciplinary education, collaborative practices, presence of local strategic leaders, and geographical proximity [7].

Maxey in 2015 [177] and Atchison in 2018 [9] discussed case studies of primary oral health care models in the USA and also described the role of case management and multidisciplinary care plans as facilitators of integration. Moreover, they mentioned that the recruitment of coordinators helps in rendering seamless case management and patient navigation [9, 177]. Furthermore, according to the case studies reported by Brownlee in 2012 [178] and Maxey in 2015 [177], and later in an invited commentary by Atchison and Weintraub in 2017 [167], co-located dental clinics and shared common health records facilitate integration at several organizations including federally qualified health centers, health maintenance organizations, and private group practices in the USA [167, 177, 178].

Barriers to integration

At the political level, oral health remains less prioritized and is considered secondary to overall health status [7, 199, 200]. There is a lack of policies on oral health integration [7]. Moreover, insurance plans also cover dental plans separately from medical plans [7, 199]. Ghorbani et al. in 2017 reported inadequate participation of community leaders as a challenge to integrating oral health services into primary health care in Iran [173]. They also identified the lack of coverage of oral health topics in the school curriculum as a barrier for oral health integration in school health programs [173]. Atchison and Weintraub in 2017 reported restrictive licensing and scope of practice acts as barriers to such integration [9, 167]. For instance, some laws don't allow dental hygienists to work in non-dental settings, or nurse practitioners to work in dental settings [167].

Another scoping review on policies and program in integrated primary oral health care by Harnagea et al. in 2018 [8], a qualitative study by Ghorbani et al. [173] in 2017, and a systematic review by Prasad et al. in 2019 [197] considered high implementation cost, human resources issues, and inadequate infrastructure as barriers to integration [7, 8, 173, 197]. These human resources issues included insufficient human resources with the high workload at health centers, staff turnover, and time constraints such as lack of time for preventive dental services [7, 173,

199]. Similarly, inappropriate facilities and inadequate infrastructure and equipment adversely affect oral health integration [7, 173]. Furthermore, the review performed by Harnagea et al. discussed opposition from the private dental sector as among the major challenges to oral health integration [8].

According to the literature, the lack of focus on interprofessional education and training as well as the lack of oral health-related competencies among primary health care providers and the lack of care continuity are also barriers to integration [7, 9, 167, 173, 197, 201]. Poor care continuity is associated with poor referral systems, lack of integrated electronic health records, lack of interprofessional communication, poor integration practice guidelines, and weak links among primary care facilities, educational institutions, and the public health system [7, 9, 167, 173, 197, 201]. Niesten et al. in 2020 also identified ambiguous responsibilities among care providers and poor awareness and low prioritization by care providers and patients as barriers to integration of oral health care for older adults in East Netherlands [200].

In general, in several countries around the world, the incorporation of oral health into primary care is still in its nascent stage [7]. According to a qualitative study on perceptions of primary health care providers in Quebec by Harnagea at el. in 2018, primary health care workers were concerned about the lack of oral health in the primary health care system in Quebec and considered integration as a measure to tackle the population's oral health needs [198]. In this scenario, the Cree Board of Health and Social Services of James Bay (CBHSSJB), serving Cree communities, considered implementing a model for the integrated delivery of health and social services including oral health care in its Strategic Regional Plans [25, 45].

2.6. Integrated primary health and oral health care in the Cree population

A systematic literature review conducted by Lewis et al. [202] in 2017 justified the need for integrated care in Indigenous health care organizations on the basis of widened health disparities among Indigenous and non-Indigenous people, the need for providing culturally safe services,

socio-economic barriers, health care cost, inadequacy of health insurance, lack of public transportation especially in remote areas, and available evidence on the successful outcomes of integrated care including improved access, care continuity, and cultural safety [202].

2.6.1 Health care system at Cree Board of Health and Social Services of James Bay

The James Bay and Northern Quebec Agreement was signed in 1975 by the Cree and Inuit peoples of Quebec, the governments of Canada and Quebec, the James Bay Development Corporation, the James Bay Energy Corporation, and Hydro-Québec. Further to this agreement, the Cree Board of Health and Social Services of James Bay (CBHSSJB) was founded in 1978 for the administration of health and social services for the population of this region [25, 27]. In collaboration with the Quebec Ministry of Health and Social Services, the mission of the CBHSSJB is "*to provide for the management and organization of health and social services in the nine communities of the Cree Territory of James Bay. To do so, it must coordinate and implement health and social services with a view to maintaining, improving, and restoring the health and well-being of its population*" [45, 203].

2.6.1.1 CBHSSJB Departments

The CBHSSJB has been categorized into five departments: 1) General Management Department, 2) Miyupimaatisiiun Department, 3) Pimuhteheu Department, 4) Nishiiyuu Department, and 5) Administrative Services [204].

1) General Management Department

The CBHSSJB is specifically for Cree communities and governed by a Board of Directors with an elected Chairperson [45, 203]. The Board of Directors comprises the chair, executive director, nine community representatives (one from each community), one clinical staff representative, and one non-clinical staff representative [203]. Other integral parts of the organizational structure include advisory councils and their executive committees such as Council of Physicians, Pharmacists, and Dentists (CPDP), Council of Nurses, and Council of Chishaayiyuu (elders) as well as

Service Quality and Complaints Commissioner [203]. Advisory councils and committees, the Service Quality and Complaints Commissioner, and the medical examiner report directly to the Office of the Chair [203].

2) Miyupimaatisiiun Department

This department is responsible for health services in each community. The Miyupimaatisiiun Department operates a Community Miyupimaatisiiun (Health) Centre (CMC) in each community and the 29-bedded Chisasibi Regional Hospital. The CMC is responsible for general medicine, home care, dentistry, and social services in each of the nine communities [203]. It includes a walk-in clinic as well as community health clinics serving *Awash* (for mothers and children aged 0–9), *Uschiniichisuu* (for youth aged 10–29), and *Chishaayiyuu* (for people 30 and older) [204]. The Chisasibi Regional Hospital provides primary and secondary health care services to the Cree population. This hospital has a radiology department, liaison department, laboratory, physiotherapist and nutritionist services, and a dental clinic [203].

3) Pimuhteheu Department

This department includes pre-hospital services and medical emergency interventions with partners like police, firefighters, and ambulance services [204]. Its unit for the program development and support group coordinates the planning and development of regional health program initiatives such as disability programs, mental health, and midwifery [204]. The Pimuhteheu Department also manages youth healing services and a youth protection department [204].

In addition, Pimuhteheu incorporates a public health department that aims to preserve and improve the health of the population [204]. The public health department covers public health services for *Awash*, *Uschiniichisuu*, *Chishaayiyuu* as well as a program for surveillance, evaluation, research, and communications [204]. These services cover various domains of health care: *Awash* conducts programs related to maternal and child health, breastfeeding, nutrition, oral health, vaccination, screening for genetic diseases, and surveillance and protection for infectious diseases. *Uschiniichisuu* focuses on relationships and sexual health, addictions, school nurse, and healthy school approaches. Similarly, *Chishaayiyuu* focuses on the promotion of healthy lifestyles, prevention of injuries, and environmental health [205]. *Â Mâshkûpimâtsît Awash* program

targets parents and young families and brings together all maternal and child health services [205]. This program helps women during their prenatal and perinatal period, and until their children reach the age of nine years [205].

4) Nishiiyuu Department

The role of this department is to ensure the cultural competency of services based on Cree knowledge and values [204].

5) Administrative Services

This department works regionally and includes human, financial, and information technology resources [204]. It also covers Wiichihiituwin (Cree Patient Services) within its liaison offices in Chibougamau, Val d'Or, and Montréal [45].

2.6.2 Dental services at Cree Board of Health and Social Services of James Bay

Following the James Bay and Northern Quebec Agreement, in 1981 CBHSSJB expanded the dental health program and recruited permanent and temporary dentists to work in the communities. In 1984, children still had very poor oral health which led to the recruitment and engagement of dental hygienists in CBHSSJB programs [53]. In 1988, a comprehensive program of fluoride supplements, dental check-ups, and information for parents was included in the well-baby clinics [53]. Over the years, dental services in the Cree communities have been expanded. The establishment of dental clinics in all communities, digitalization of clinics, development and implementation of preventive dental programs, and introduction of training sessions for dental care providers are examples of this expansion [53, 206].

The dental service in the Cree communities is comprised of two components: clinical and public health [87].

Clinical component

Each CMC has a separate dental clinic section in each of the nine communities, where free services are provided by dentists and dental hygienists [29, 30]. Dental services are regionally managed by the regional chief of dentistry as well as locally by the management team at each CMC

[89]. Only in Mistissini and Chisasibi are specialized dental treatments (orthodontics, endodontics, and oral maxillofacial surgery) provided by visiting specialists a few times a year [30, 87, 89]. Visiting denturologists are present in Chibougamau, Val d'Or, Mistissini, and Chisasibi [89]. The organization recruits Indigenous dental assistants for assisting dentists and preparing for dental procedures, as well as Indigenous receptionists for managing schedules, appointments, clinics, and inventories [87, 89]. Dental treatments requiring general anesthesia are offered in Montreal. They are arranged by collaboration between the dental clinic and Cree Patient Services (Wiichihiituwin) [30].

Public health component

The Public Health Dental Service arranges various preventive programs such as individual assessment and follow-up for school children, a sealant program, a fluoride therapy program, toothbrushing sessions in schools and daycare centers, oral hygiene instruction for the maternal and child health program, a nutrition program, and an oral health education program, carried out by various dental and non-dental health care providers including community health representatives (CHRs) and other Awash professionals [60, 203]. Dental hygienists are under the professional supervision of the dentist advisor for their public dental health activities. Moreover, dental hygienists along with community health representatives provide preventive dental care to the age group 0–9 years via school, daycare, and CMC [203]. Dental hygienists also work together with nutritionists and nurses for oral health promotion activities at various public places and also via local radio stations [89].

2.6.3 Strategic plan

In 2004, the CBHSSJB developed its 10-year Strategic Regional Plan to improve the health and social wellness of the Cree population [25]. This Strategic Regional Plan considered implementing integrated care in Cree communities, and integration of oral health into primary care was one of its specific objectives [25, 26]. Furthermore, in 2013, the CBHSSJB introduced *Iiyuu Ahtaawin Miyupimaatisiiun Planning* (Eeyouch Cree Community Wellness Planning) which focuses on community participation in health and wellness planning [207]. It includes wellness committees that engage in local strategic planning and work with multiple Cree regional bodies to identify health

priorities and establish an action plan [207]. The CBHSSJB has also developed its second 10-year integrated care strategic plan in 2016 [45]. This plan is a continuation of the Strategic Regional Plan 2004–2014 and considers the outcomes, successes, and deficits from the previous plan [45].

Since the introduction of the first Strategic Regional Plan, the evaluation of integrated primary oral health care at CBHSSJB has not been carried out. The following chapters outline the research methodology and results of this PhD research project that was developed to evaluate the integration of oral health into primary care in Cree communities of North Quebec.

CHAPTER 3. RESEARCH METHODOLOGY

The PhD research project was conducted in two phases. In the first phase, a scoping review was conducted. This review allowed examination of the existing evidence on the integration of oral health into primary care in Indigenous health care organizations and other related institutions. In the second phase, a research study was conducted to evaluate the integration of oral health into primary care in Quebec Cree communities.

3.1 Scoping review

The objective of the scoping review was to systematically map the available programs and their outcomes on the integrated primary oral health care programs in Indigenous communities, underpinned by the two-eyed seeing concept.[1] According to Munn et al. [209], the scoping review is an effective method *to* "*determine the scope of a body of literature on a given topic and give clear indication of the volume of literature and studies available as well as a broad overview of its focus.*" The methodology of this scoping review was developed based on the Arksey and O'Malley's framework [210] and additional recommendations for conducting and reporting scoping reviews by Levac et al. [211]. The six stages included 1) identifying the research question, 2) identifying relevant studies, 3) selecting studies, 4) charting the data, 5) collating, summarizing, and reporting the results, and 6) consultation with relevant stakeholders [210-212].

Ovid Medline, Ovid EMBASE, EBSCO CINAHL, ProQuest Central, Google Scholar, Indigenous databases such as the Indigenous Studies Portal Research Tool (iPortal), National Collaborating Centre for Aboriginal Health, Native Health Database, and Bibliography of Native North Americans, and non-indexed journals on Indigenous health were searched for relevant literature. The eligibility criteria were developed according to Population Concept Context (PCC) [212] and included publications in the English language on integrated primary oral health care services involving Indigenous populations from all around the world, [212]. The charted data was classified and analyzed using qualitative content analysis. The two-eyed seeing concept guided the interpretation and synthesis of the evidence on approaches and outcomes for the integrated primary oral health care by "weaving back and forth" between Western and Indigenous worldviews [208, 213]. The

[1] Two-eyed seeing (Etuaptmumk) is defined as "to see from one eye with the strengths of Indigenous ways of knowing, and to see from the other eye with the strengths of Western ways of knowing, and to use both of these eyes together." [208]

PRISMA Extension for Scoping Reviews (PRISMA-ScR) [214] guideline was used in the publication of the first article entitled: "Two-Eyed Seeing of the Integration of Oral Health in Primary Health Care in Indigenous Populations: A Scoping Review" [215].

3.2 Evaluation of the integration of oral health care into primary health care in Quebec Cree communities

3.2.1 Study design

The PhD research study was nested in a project entitled "*Oral Health Integrated into Primary Care: Participatory Evaluation of Implementation and Performance in Quebec Cree Communities*" [216] funded by the Canadian Institutes of Health Research. The study used a multiple case study design within a qualitative approach and a developmental evaluation methodology [217-219].

3.2.1.1 Rationale for using qualitative approach

In the field of Indigenous research, the dominant positivist Western rational paradigm has been criticized as it attempts to generalize experiences, find universal reality, and achieve objectivity [220]. In contrast, the qualitative approach aims for an in-depth understanding of the lived experiences of people in all complexities and diversities [220]. According to Blaxter, Hughes, and Tight [221], qualitative research "*tends to focus on exploring, in as much detail as possible, smaller numbers of instances or examples which are seen as being interesting or illuminating.*" This approach contributes to bridging the gap between Western and Indigenous ways of knowing by respecting the existence of multiple realities and truths in the experience of study participants, allowing them to tell their stories [222]. Storytelling is consistent with Indigenous research methodologies as it creates a space for Indigenous participants to share their stories based on their understanding of the phenomenon [223, 224]. According to Kavoch [225], qualitative research *is "like a fertile garden for seeds similar to Indigenous methodologies to grow and therefore provides range and possibilities to merge contextualized knowledge such as indigenous knowledge within it.*"

In Indigenous worldviews, knowledge is relational and transferred through oral tradition from generation to generation. Knowledge is also co-created within the relational dynamics of the individual, between individuals, and between individuals and nature, i.e., *self-in-relation* [223, 225,

226]. This research project engaged community members at all the stages of the research process, to ensure the cultural appropriateness of the study methodology and methods [226]. (discussed in detail in section 3.2.4, Study phases and data collection).

3.2.1.2 Rationale for using developmental evaluation

The National Collaborating Centre for Aboriginal Health suggests that program evaluation with Indigenous organizations should include contextual factors, and should be culture-sensitive and participatory in nature [227]. As effectiveness of the integrated primary oral health care program is not well established, we used the developmental evaluation model rather than formative and summative evaluations [219]. According to Gamble, developmental evaluation is useful in situations where innovation is identified as "*a core value, there is an iterative loop of option generation, testing, and selection; board and staff are in agreement about innovation and willing to take risks; there is a high degree of uncertainty about the path forward; there are resources available for ongoing exploration; and the organization has a culture suited to exploration and enquiry*" [228].

Developmental evaluation methodology uses a combination of both bottom-up and top-down approaches [219]. The bottom-up approach is driven by participatory evaluation that encourages community participation, community development, as well as mutually respectful partnerships between the researchers and the community [219, 229]. The top-down approach is theory driven and inspired by evidence-based approaches [219]. In this PhD research project, both bottom-up and top-down approaches were encouraged by community partnership, appreciative inquiry evaluation, and integrated care frameworks [31, 136, 193, 219].

Developmental evaluation has been used in various applications, for example to evaluate public health interventions, to understand team dynamics in new programs, to develop and implement evidence-based guidelines in health care settings, as well as to establish values and collaborative processes among organizations [230-232]. This type of evaluation can help in addressing complex health system issues in culturally diverse contexts [230]. This methodology has been used successfully in Indigenous communities in Australia to evaluate a wide-scale interactive project on primary health care [230, 232].

3.2.1.3 Rationale for using Appreciative Inquiry framework

Among various frameworks of developmental evaluation, Appreciative Inquiry (AI) was selected. With its roots in social construction, AI is a novel approach to organizational change, organizational evaluation, as well as research [233]. AI inquires about stories of life-giving forces, selects themes in stories, and creates images for the desired future [31]. AI discovers and values the strengths, aspirations, assets, and visions of the stakeholders' organization and recognizes the factors which give meaning to the organization and its work [21]. This approach also helps in identifying problems, criticisms, and challenges and employing them to suggesting positive recommendations [234, 235].

AI is defined by Cooperrider and Whitney as "*the cooperative, co-evolutionary search for the best in people, their organizations, and the world around them. It involves systematic discovery of what gives life to an organization or a community when it is most effective and most capable in economic, ecological, and human terms*" [236, 237]. It has been used in various fields such as business, education, and recently in the health sector [20, 31, 233, 238].

Principles of Appreciative Inquiry

1. Constructionist Principle: According to this principle, organizations are a human construction with multiple realities. Any effective change starts with understanding people within the organization [31, 236, 238, 239].

2. Principle of Simultaneity: This principle states that inquiry and change are not separate but are simultaneous. The moment a question is asked, change starts taking place [31, 236, 238, 239].

3. Poetic Principle: This posits that an organization is like an open book in which its members and those who interact with them are the co-authors. Accordingly, organization members are free to choose which part of the story they want to inquire into, such as the moment of creativity or joy, or the moment of problem or stress. Like poems that have multiple interpretations, organizations have multiple interpretive possibilities in their past, present, or future [31, 236, 238, 239].

4. Anticipatory Principle: This states that the future image of the organization guides the current behavior of the organization. Therefore, the positive image of the organization can lead to positive actions of behavior [31, 236, 238, 239].

5. Positive Principle: This principle posits that asking positive questions develops joy and excitement among the participants, leading to more engagement of participants, and this further leads to long-lasting and effective changes [31, 236, 238, 239].

6. **The Wholeness Principle:** This corresponds to involving all stakeholders to imagine the desired future. By involving members of an organization, they can experience how their involvement contributed to the whole, which further motivates them to contribute more [31, 236, 240].

Phases of appreciative inquiry

The 4-D model of appreciative inquiry is composed of four phases: *discovery, dream, design,* and *destiny* [31, 233, 238, 241].

Phase 1. Discovery: *(Appreciating)* corresponds to "*What is the best of what is?*" This phase focuses on what gives life and energy to individuals and the organization [31, 233, 238].

Phase 2. Dream: *(Envisioning results)* corresponds to "*What might be.*" The dream phase focuses on sharing stories recalling peak experiences or high points and determining core values. The future is envisioned based on past experiences [31, 233, 238].

Phase 3. Design: *(Co-constructing)* corresponds to "*What would be ideal?*" During this phase, the group reaches consensus and develops a whole vision for the organization. Provocative prepositions are developed for creating innovative ways for the future that was dreamed in the dream phase [31, 233, 238].

Phase 4. Destiny: *(Sustaining)* corresponds to "*How to empower, learn, and adjust/improvise?*" It focuses on implementing actions based on provocative prepositions and the organization evolves into the preferred future image [31, 233, 238].

In this PhD research project, AI was selected mainly because it is a success-focused, culturally responsive, and cost-effective framework that encompasses the diverse perspectives and experiences of the stakeholders [242]. Appreciative Inquiry empowers Indigenous communities, acknowledging their traditional knowledge and appreciating their strengths [243, 244]. It shows coherency with the storytelling method of reproducing, preserving, and transferring Indigenous knowledge from generation to generation [223, 225, 226]. Appreciative Inquiry incorporates the dream phase in its methodology which is in line with spirit, dreams, and visions as the sources of

knowledge in the Indigenous worldview [31, 226]. Appreciative Inquiry has already been used in multiple studies involving Indigenous populations [31, 243, 245-248]. Furthermore, it has been reported that Indigenous people felt comfortable during AI process and meetings [244, 246].

3.2.1.4 Rationale for using multiple case study design

The use of case study design was driven by the fact that it is the most common design used in evaluation research [217, 218]. The case study design is built on a constructivist paradigm asserting that the truth is relative and is dependent on one's perspective [249]. Yin [218] defined the case study as "*an empirical inquiry about a contemporary phenomenon (e.g., a 'case'), set within its real-world context—especially when the boundaries between phenomenon and context are not clearly evident*" [218]. According to Creswell [250], the case study is an approach that "*explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information, and reports a case description and case themes*."

Furthermore, the case study design is ideal to understand complex issues such as integrated care which is composed of multiple levels and processes [141] and also involves various stakeholders including policy makers, managers, regulators, health care providers, as well as service users [140, 141]. According to Yin, a case study can be single or multi-case, with single or multiple embedded units of analysis: 1. Single holistic case involves one case study and one unit of analysis; 2. Single embedded case entails one case with more complex subunits of analysis; 3. Holistic multiple cases refers to the inclusion of several cases but each case has only one unit of analysis; and lastly, 4. Embedded multiple case design also includes multiple cases but includes multiple units of analysis [217, 218]. For this research study, among these types of case study designs (**Figure 3**), the multiple holistic case study was selected [218, 249]. According to Yin, "*a 'case' is generally a bounded entity (a person, organization, behavioral condition, event, or other social phenomenon), but the boundary between the case and its contextual conditions may be blurred*" [217] and the holistic multiple case study refers to the inclusion of several cases but each case has only one unit of analysis [218]. Multiple case study was considered because it provides more robust evidence and confidence in the findings than a single case study [218, 251]. Furthermore, according

to Yin, the holistic nature of the study explores the global nature of the program [218]. Hence, in this PhD research, holistic case study design helped to analyse the integrated primary oral health programs at CBHSSJB as a "whole." This type of design employs multiple types and sources of data to explore and explain the phenomenon of interest within each case as well as to examine the same phenomenon across several different cases [218, 249].

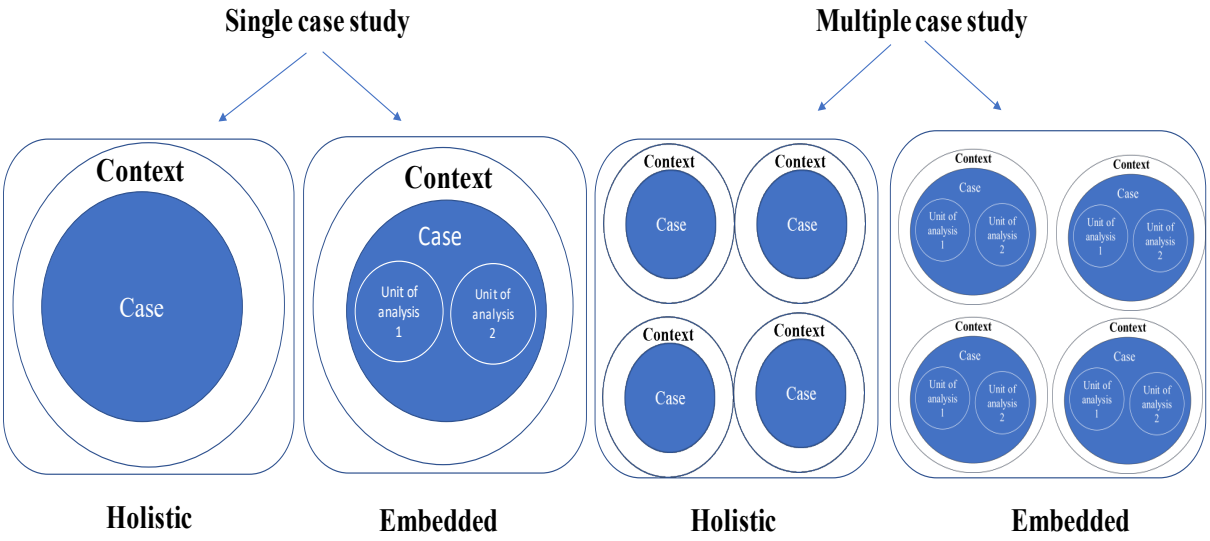

Figure 3. Types of case study design (Adapted from Yin RK. Case study research: Design and methods. USA: SAGE publications, Inc; 2014.)

3.2.2. Study setting

Patton proposed a purposeful sampling principle for case studies where the case should be chosen from among possible cases that are information-rich and provide in-depth knowledge of the study concept [252, 253]. The purposeful sampling method was used to select four Cree communities (**Figure 4**) as the unit of analysis based on identification of diverse characteristics such as demographic profile, geographical characteristics, culture including their dialects, traditions, and values, and dental care characteristics [254]. This information was discussed with the Cree stakeholders.

Community 1 is inland, southern, the largest Cree community in terms of area, and situated at the south-east end of the largest natural lake in the province of Quebec. Community 2 is coastal, northern, the biggest of all nine communities in terms of population, and situated on the south

bank of La Grande River. Community 3 is coastal, southern, and the oldest Cree village on the shores of Rupert Bay. Lastly, community 4 is inland, southern, situated in the middle of Eeyou Istchee territory, and is the smallest of the Cree communities on the western shores of Lake Champion [44, 254].

Figure 4. Map of the James Bay Eeyou Istchee (Source: Annual Report of the Cree Board of Health and Social Services of James Bay, 2012-2013) [255]

3.2.3 Sampling

Maximum variation sampling and snowball techniques were used to identify and recruit community participants [253]. This sampling strategy allowed the emergence of diverse viewpoints.

Maximum variation sampling is a purposive sampling in which an evaluator observes the information that explains variations as well as common patterns [253]. To ensure cultural appropriateness, research team consulted the Cree community research partners. These partners helped in the recruitment of study participants, including administrators, care providers, and patients. Through snowball sampling, selected participants recommended other potential candidates for the study [253]. Potential participants were invited to take part in the study, and received information explaining the purpose of the study, benefits and risks, voluntary participation, and their role in the study as a part of the written informed consent process (Appendix 4). Research team members and community partners responded to any questions or doubts if needed.

3.2.4 Study phases and data collection

The study was conducted in four phases as per the AI 4D model (**Figure 5**):

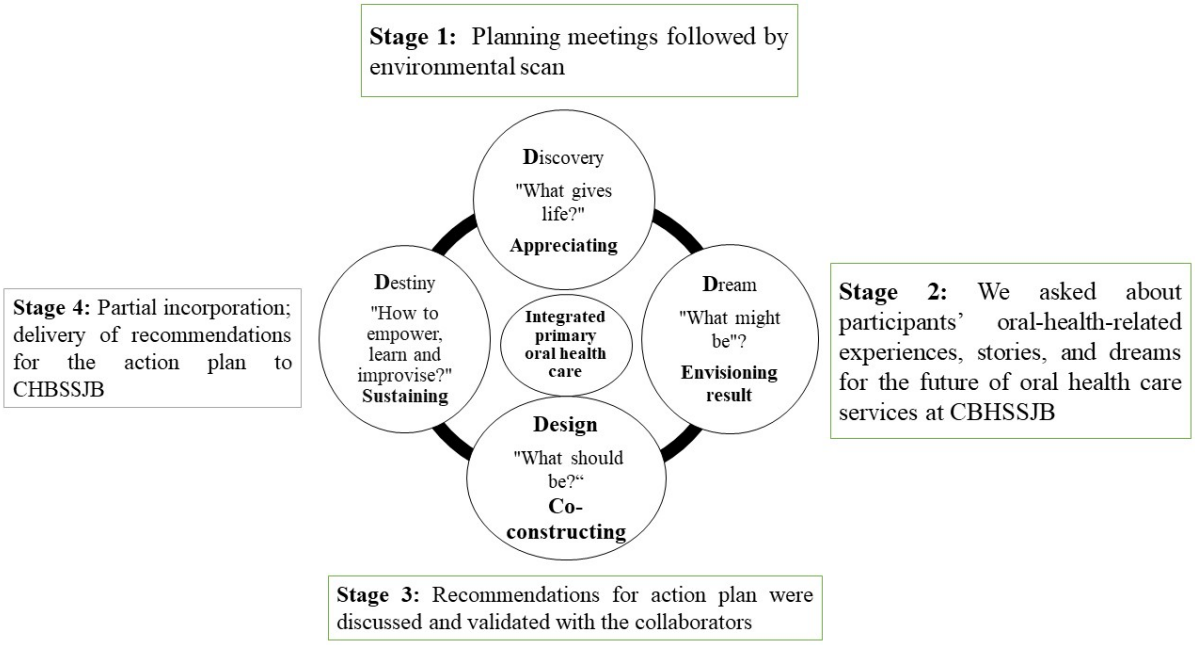

Figure 5. Study phases as per the AI 4-D model [31] (Reused with permission. Appendix 1)

Phase 1. Discovery: This phase included planning meetings followed by the environmental scan. The planning meetings were conducted in the form of a three-day workshop in one of the communities and a two-day videoconferencing workshop simultaneously in Mistissini and Montreal

[26]. These workshops engaged 27 representatives of Cree community members, health and oral health care service providers, and administrators to solicit their feedback and to facilitate the development of agreement and community consensus on the project evaluation plan [31, 256]. Various evaluation models and dimensions were also discussed with these stakeholders. Accordingly, the five foundations of integrated care model [193] was selected to represent the dimensions of the evaluation.

The environmental scan [257, 258] included observation of all four Community Miyupimaatisiiun Centres (CMCs) and documentation review. Documentation included the most recent information related to the oral health policies at CBHSSJB [259, 260], annual health reports, program descriptions, guidelines, protocols, checklists, job descriptions, schedules, pamphlets, and memos, among others. Selected protocols consisted of guidelines and mandates for the various health professionals and managers involved in primary health care as well as documents and pamphlets for information on health care users. Key collaborators were contacted to validate found information when needed. These documents supplemented findings from the interviews and group discussions [218] as presented in article 2 in chapter 4.

Phase 2. Dream: Key stakeholders (n=44) such as administrators, health and oral health care providers, and patients at the CMCs and hospital were asked about their oral-health-related experiences, stories, and dreams for the future of oral health care services in their communities [31]. Six group discussions and 36 face-to-face individual interviews were conducted in English or French by research trainees and research team members experienced in and familiar with qualitative interviewing. The semi-structured question guide (Appendix 3) was developed based on the rainbow model of integrated care, the five foundations for integrated care model (described in the next section on data analysis), and AI, which was adapted based on the participants' profiles (patients, administrators, and health care providers) [135, 242]. The same guide was used for both group discussions and interviews.

The interviews lasted on average 40 minutes, and focus group discussions lasted on average one hour and 15 minutes and were conducted in a private setting at the CMCs or the hospital. They

were digitally recorded to ensure the data was retrievable and transcribed verbatim. Data collection continued until saturation was achieved [253].

Phase 3. Design: This phase involved formulating recommendations for deploying the "dream" oral health care at CBHSSJB in everyday practice—i.e., converting dream into reality [31, 256]. The results and recommendations realized through the previous phases were discussed, consulted, and validated for the stakeholders' review, acceptance, and confirmation for implementation. These discussions and validations were held at various CHBSSJB official meetings and other specifically planned meetings with the stakeholders.

Phase 4. Destiny: The PhD study partially incorporated this phase. The proposed recommendations for the action plan were delivered to CBHSSJB in the form of lay and scientific reports and presentations.

3.2.5 Data analysis

The data analysis process was discussed with community research partners during a meeting on data analysis and was conducted with their collaboration to ensure Indigenous worldviews. It included transcription, debriefing, codification, data display, inductive-deductive thematic content analysis, and triangulation [261]. As suggested by Yin [218] and Miles and Huberman [251], at first the data analysis was conducted at the within-case level to explore and describe the findings for each case. The results of each case were thoroughly outlined before moving to the next case. This was followed by a cross-case analysis to identify similarities and differences across the cases to synthesize the findings and draw conclusions as a whole [21, 251]. Transcriptions were entered into ATLAS.ti, a qualitative analysis software, to help with data management and analyses.

Mixed deductive and inductive approaches were used to identify themes. Data analysis conceptual frameworks were used to develop themes deductively, whereas new themes from the data were identified inductively. The rainbow model of integrated care [136, 263], the five foundations for integrated care model [193], and Picker's principles of patient-centered care [264] were used as conceptual frameworks for analyzing the data and integration dimensions, as illustrated in PhD published articles (see Chapter 4).

All transcripts were read and re-read, and initial coding was conducted. This initial coding helps to capture key issues derived from the literature [262]. A coding list was developed based on the coding of the first few transcripts. Then the coding list was discussed with the research and community team members to bolster the consistency of the data interpretation as well as the coding strategy. The codes were collapsed to categories, potential themes, and final themes via an iterative process by critically analyzing concepts, linking them across the collected data, and reviewing study objectives and conceptual frameworks [136, 193, 263, 264] .

The rainbow model of integrated care was introduced in 2013 by Valentijin et al. [136] and was instrumental in understanding the complexities of integrated care [263]. This model is structured conceptually on three levels: macro, meso, and micro; and comprises four specific dimensions: system integration (macro-level), organizational integration (meso-level), professional integration (meso-level), and clinical integration (micro-level) [136, 263]. In addition, two more cross-dimensions, functional and normative integration, enable interlinking between the various integration levels [136, 263] (**Figure 6)**.

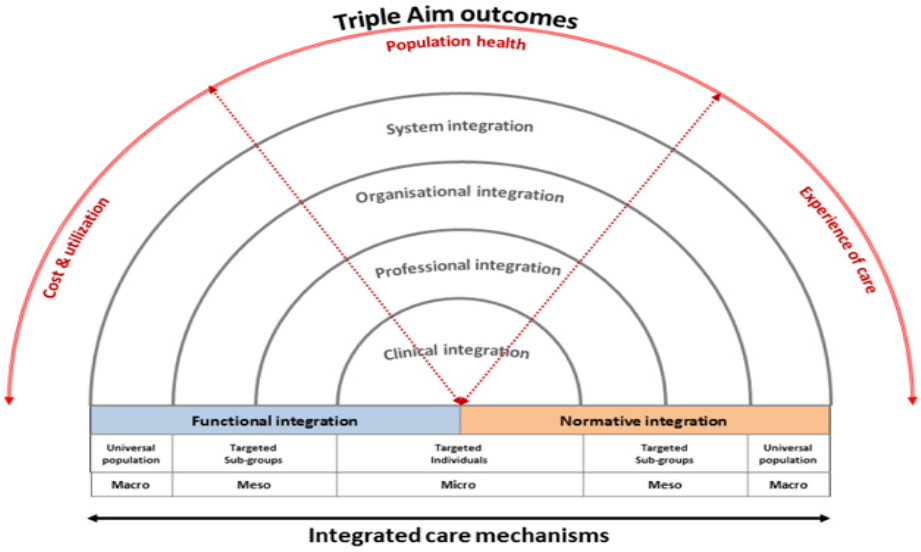

Figure 6. Valentijn's Rainbow Model of Integrated Care [135, 265] (Reproduced with permission, Appendix 1)

The Five Foundations for Integrated Care was developed by the Canadian Nurses Association, the Canadian Medical Association, and Health Action Lobby in 2013 [193] (**Figure 7**). The five foundations for the integrated care model are patient access, patient-centered care, informational continuity of care, management continuity of care, and relational continuity of care [193].

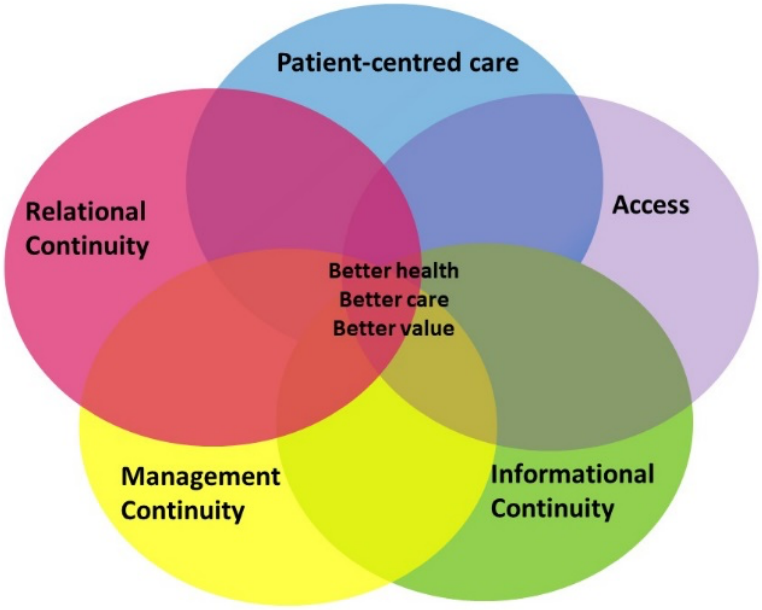

Figure 7. Five Foundations for Integrated Care model [193] (Reproduced with permission, Appendix 1)

Picker's principles of patient-centered care, developed in 1993 by the Picker Institute and Harvard Medical School, comprise the following eight principles: respect for patient's preferences, information and education, access to care, emotional support, involvement of family and friends, continuity and transition, physical comfort, and coordination of care [264].

Using a predefined framework in analysis may bias the analysis as there is chance of omitting the findings if they are not relevant within the chosen framework [266]. Therefore, the use of mixed deductive and inductive approach helped in preventing such biases. During cross-case analysis,

themes were compared and contrasted across all four cases. Final themes were developed by maintaining major similarities and differences across the cases and providing explanations of differences. Cross-case themes were also discussed with research team members for clarification and confirmation. Word table and matrixes were used to visually examine and synthesize the data for each case and across cases. Any differences in interpretation were resolved by discussion until consensus was achieved.

3.2.6 Methodological rigor

The rigor in this study was achieved by taking the following research measures under the commonly used four criteria for rigor described by Lincoln and Guba in 1985 [267]: credibility, transferability, dependability, and confirmability.

3.2.6.1 Credibility

Credibility corresponds to internal validity. According to Lincoln and Guba, "*Credibility is the confidence that can be placed in the truth of the research findings*" [267, 268]. Credibility in this study was achieved through triangulation. "*Triangulation implies taking different angles from which to look at the same phenomenon, using different data collection methods and different data sources*" [218, 269, 270]. In this regard, this study attained methodological triangulation by using multiple data collection methods such as focus group discussions, interviews, and documentation review [268]. Similarly, data source triangulation was achieved by collecting information from diverse groups of participants with different roles, including administrators, health and oral health care providers, and patients [268, 271]. Investigator triangulation involved several research team members in reviewing data analysis results, which allowed us to offset individual investigators' possible biases and allowed the research team to achieve a reasonable degree of consensus [268].

Furthermore, member checking using synthesized data was done. During member checking, preliminary results and drafts of each paper were provided to stakeholders and professionals working at the CBHSSJB organization for review and their approval, and they were asked to suggest any change or additional information [267, 268, 272]. Moreover, enduring engagement with the CBHSSJB and participants also complemented the credibility of the data [268]. Further, being

multiple case study, we conducted a within-case analysis followed by cross-case pattern matching that helped in securing credibility [218, 251, 273]. We matched and contrasted the emerged themes, either expected patterns or patterns identified in the existing literature.

3.2.6.2 Transferability

Transferability roughly corresponds to external validity or generalizability. As per Lincoln and Guba, transferability is the "*degree to which the results of qualitative research can be transferred to other contexts or settings with other respondents*" [267, 268]. Two types of generalization are discussed in the literature: "*statistical generalization that refers to the generalization from observation to a population and analytical generalization which means generalization from empirical observations to theory, rather than a population*" [218, 270, 274]. The purpose of the case study is not the statistical generalization of a particular phenomenon but rather the interpretation of an in-depth understanding of the phenomenon as it actually happens, irrespective of whether there are other similar situations [275]. This guarantees trust that the findings are applicable to a similar situation [217, 218]. In this research, analytical generalization corresponds to the generalization and applicability of integration of oral health into primary health care as a model of a health care service-based phenomenon in similar settings. Moreover, as per Yin's book *Case Study Research: Design and Methods*, conducting and analyzing multiple case studies within an organization further reinforced the transferability of this study [218].

Being a qualitative study, transferability in this research was attained by verbatim transcripts and the thick description of the participants and the research process [268]. Strategies such as data saturation as well as the use of appropriate sampling techniques confirming the representativeness of the sample add to the transferability of the research [271].

3.2.6.3 Dependability

Dependability is comparable to reliability and is defined as "*the stability of findings over time and under different conditions*" [267, 268]. In the current research, dependability was attained by the transparent description of each research step from the project's beginning to the end [268]. It was also obtained by using the case study protocol. The case study protocol verified that all selected

cases and all participants were subject to the same entry and exit procedures and interview questions [218, 276]. Reliability was also ensured by systematic documentation of all the procedures and proper record-keeping that allows the replication of the case study [218]. In addition, specifying the name of the organization (CBHSSJB) also makes the study reliable as it enables other researchers to contact the organization [277]. Dependability of the coding and analysis process was also ensured by cross evaluation and triangulation involving several research team members in reviewing data analysis results, which outweighed the individual investigators' potential biases.

3.2.6.4 Confirmability

Confirmability is equivalent to objectivity and refers to the "*degree to which the findings of the research study could be confirmed by other researchers*" [268]. This criterion was secured by the review of transcripts and drafts of the case study by peers who were involved in the major research project. Feedback on the data interpretation was sought from all research team members. Detailed methodological description and all types of triangulation also add to the confirmability of the research [271, 278].

3.2.7 Ethical considerations

A proper balance between ethics, culture, and research methods is paramount in producing culturally sensitive research [279]. Ethical approval for this study was obtained from the Institutional Review Boards of Université de Montréal (CERES, certificate # 15-130-CERES-P) and McGill University (IRB certificate # A10-B39-18A), as well as the Research Committee of the CBHSSJB. Community leaders' consent was obtained before seeking individuals' informed consent (Appendix 2). All participants consented to take part in the study by signing the consent form and provided permission for audio recordings.

The project adheres to the Standards for Reporting Qualitative Research guidelines for reporting qualitative studies [280], and was performed in compliance with the CHIR ethics framework in the Indigenous context for conducting culturally sound research (Tri-Council Policy Statement-2) and the ethical guidelines of Ownership, Control, Access and Possession [281, 282]. Chapter 9 of

the Tri-Council Policy Statement-2 guides research involving First Nations, Inuit, and Métis Peoples, including Cree communities, by fostering collaboration between researchers and participants, maintaining respectful relationships, and including diverse worldviews of First Nations, Inuit, and Métis peoples at all stages of the research [282].

The key element of the trusting relationship between participants and researchers was ensuring the confidentiality of the participants [282]. All methods to ensure privacy and confidentiality were mentioned in the consent form and discussed with potential participants during the consent explanation. The names of the communities and participants were anonymized and replaced with numerical codes. Signed consent forms were stored in a secured private location accessible only to the principal investigator. All electronic documents including audio recordings, transcriptions, and reviewed organizational documents were kept separately and were accessible to research team members.

CHAPTER 4. RESULTS

This chapter comprises the four articles of the thesis. The mentoring committee of doctoral student discussed each step required for writing articles. Each committee member examined and commented on article drafts before approving final manuscripts.

Table 2. Articles included in result section

Title / Journal / Status	Authors	Contributions
Two-eyed seeing of the integration of oral health in primary health care in Indigenous populations: a scoping review/ International Journal for Equity in Health/ published	**Richa Shrivastava**, Yves Couturier, Felix Girard, Lucie Papineau and Elham Emami	• Contribution to design of the scoping review • Involvement in all review phases • Drafting and critical revision of the manuscript • Follow-up requested by the publisher
Appreciative inquiry in evaluating integrated primary oral health services in Quebec Cree communities: a qualitative multiple case study/ BMJ Open/ published	**Richa Shrivastava**, Yves Couturier, Felix Girard, Christophe Bedos, Mary Ellen Macdonald, Jill Torrie, Elham Emami	• Involved in study conception, design, data collection, transcription, reviewing transcripts, coding analysis, interpretation of data • Drafting and critical revision of the manuscript • Follow-up requested by the publisher
Patients' perspectives on integrated oral healthcare in a northern Quebec Indigenous primary health care organisation: a qualitative study/ BMJ Open/ published	**Richa Shrivastava**, Yves Couturier, Naomi Kadoch, Felix Girard, Christophe Bedos, Mary Ellen Macdonald, Jill Torrie, Elham Emami	• Involved in study concept and design, acquisition, coding, analysis, and interpretation of data • Drafting and critical revision of the manuscript • Follow-up requested by the publisher
Relational continuity of oral health care in Indigenous communities: a qualitative Study/ BMC Oral Health/ published	**Richa Shrivastava**, Yves Couturier, Stefanik Simard-Lebel, Felix Girard, Nadia Verenna Bendezu Aguirre, Jill Torrie and Elham Emami	• Involved in study concept and design, acquisition, coding, analysis and interpretation of data • Drafting and critical revision of the manuscript • Follow-up requested by the publisher

4.1 Article 1

Two-eyed seeing of the integration of oral health in primary health care in Indigenous populations: a scoping review

Authors: Richa Shrivastava[1], Yves Couturier[2], Felix Girard[1], Lucie Papineau[3], Elham Emami[4]

[1]Faculty of Dentistry, Université de Montréal, Montréal, Québec, Canada.

[2]School of Social Work, Université de Sherbrooke, Sherbrooke, Québec, Canada.

[3]Cree Board of Health and Social Services of James Bay, Oujé-Bougoumou Healing Centre, Oujé-Bougoumou, Québec, Canada.

[4]Faculty of Dentistry, McGill University, Montreal, Québec, Canada.

Published as:

Shrivastava R, Couturier Y, Girard F, Papineau L, Emami E. Two-eyed seeing of the integration of oral health in primary health care in Indigenous populations: a scoping review. Int J Equity Health. 2020 Jun 30;19(1):107. doi: 10.1186/s12939-020-01195-3.

4.1.1 Abstract

Background: Indigenous people experience significant poor oral health outcomes and poorer access to oral health care in comparison to the general population. The integration of oral health care with primary health care has been highlighted to be effective in addressing these oral health disparities. Scoping studies are an increasingly popular approach to reviewing health research evidence. Two-eyed seeing is an approach for both Western and Indigenous knowledge to come together to aid understanding and solve problems. Thus, the two-eyed seeing theoretical framework advocates viewing the world with one eye focused on Indigenous knowledge and the other eye on Western knowledge. This scoping review was conducted to systematically map the available integrated primary oral health care programs and their outcomes in these communities using the two-eyed seeing concept.

Methods: This scoping review followed Arksey and O'Malley's five-stage framework and its methodological advancement by Levac et al. A literature search with defined eligibility criteria was performed via several electronic databases, non-indexed Indigenous journals, Indigenous health organizational websites, and grey literature. The charted data was classified, analyzed, and reported using numeral summary and qualitative content analysis. The two-eyed seeing concept guided the interpretation and synthesis of the evidence on approaches and outcomes.

Results: A total of 29 publications describing 30 programs conducted in Australia and North America from 1972 to 2019 were included in the final analysis. The following four program categories emerged from the analysis: oral health promotion and prevention programs (n=13), comprehensive dental services (n=13), fly in, fly out dental services (n=3), and teledentistry (n=1). Biomedical approaches for integrated primary oral health care were leadership and governance, administration and funding, capacity building, infrastructure and technology, teamwork, and evidence-based practice. Indigenous approaches included the vision for holistic health, culturally appropriate services, community engagement, shared responsibility, and cultural safety. The program outcomes were identified for biological, mental, and emotional dimensions of oral health; however, measurement of the spiritual dimension was missing.

Conclusion: Our results suggest that a multiple integrated primary oral health care approach with a particular focus on Indigenous culture seems to be efficient and relevant in improving Indigenous oral health.

Keywords: Primary health care, Dental care, Integrated health care systems, Indigenous populations, Two-eyed seeing

4.1.2 Introduction

Indigenous people account for approximately 6% of the overall world population [1]. Around the world, these populations experience significant poor oral health outcomes and poorer access to oral health care in comparison to general populations [2-6]. Indigenous people face barriers related to the impact of colonization and government assimilation policies, discrimination and subsequent marginalization, lifestyle and dietary modifications, lack of understanding of their cultural values, and provision of culturally inappropriate services [7-11]. Those living in rural and remote areas further encounter barriers to oral health care such as access to and availability of dental services, shortage and accessibility of dental professionals, geographical remoteness, poor socioeconomic status, travel difficulties, infrastructure deficit, and diminished dental insurance coverage [12-14]. Furthermore, the fragmentation of health care and the disconnection between dental and medical care have aggravated the undue burden of oral disease and poor access to care in Indigenous people [15].

These disparities also confirm the failure of conventional health services in adequately serving Indigenous health care needs [16]. Hence, the integration of oral health care with primary health care has been highlighted to be effective in addressing oral health disparities among Indigenous communities [17-20]. Integrated care is emphasized as one of the basic concepts of primary care, and defined as *a coherent and coordinated set of services which are planned, managed, and delivered to individual service users across a range of organizations and by a range of co-operating professionals and informal carers* [21]. Integration of oral health into primary health care is more acceptable for Indigenous populations as it has the potential to incorporate Indigenous values

and principles, and management by Indigenous people, in addition to comprehensive service delivery [16, 22, 23]. As per the Aboriginal Mental Health best practices working group, integration is a concept that *completes the circle of care [24, 25]*.

Accordingly, some primary health care organizations serving Indigenous populations, such as Indian Health Services in the United States, First Nations Health Services in Canada, and Aboriginal Community Controlled Health Services in Australia, have integrated oral health care into their services [16]. Several action plans and strategies have been developed in these countries with objectives and recommendations on integrating culturally sensitive oral health into primary care for Indigenous populations; for instance, the First Nations Oral Health Strategy *Teeth for Life*, the Inuit Oral Health Action Plan *Healthy Teeth, Healthy Lives*, British Colombia's First Nations and Aboriginal Oral Health Strategy *Healthy Smiles for Life*, *New South Wales Aboriginal Oral Health Plan 2014–2020*, and *Filling the Gap* by the Royal Flying Doctor Service [26-33].

According to recent scoping reviews conducted by a group of researchers in Canada, several programs on the integration of oral health into primary care have been developed worldwide during the last decade [34, 35]. These programs have been successful in implementing integrated primary oral health care in terms of reducing patient non-attendance, improving providers' and patients' satisfaction, dental visits, screening and prevention of oral diseases, referrals, and access to dental care [34, 35].

However, it is unclear whether successful outcomes of integrated primary oral health care can be applied to Indigenous communities in the same way. Moreover, for effective integrated primary oral health outcomes in these communities, more exploration in Indigenous contexts is required. Hence, this scoping review was guided by the Indigenous concept "two-eyed seeing" (*Etuaptmumk*), developed by Mi'kmaq Elders Murdena and Albert Marshall [36, 37]. It is defined as *to see from one eye with the strengths of Indigenous ways of knowing, and to see from the other eye with the strengths of Western ways of knowing, and to use both of these eyes together* [36]. This approach help in a better understanding of the integrated oral health care in Indigenous communities while valuing both Indigenous and Western knowledge [36, 37]. The objective of this scoping review was to systematically map the available programs and their outcomes on the

integrated primary oral health care programs in Indigenous communities underpinned by the two-eyed seeing concept.

4.1.3 Methods

The methodology of this scoping review was adapted from the five-stage framework by Arksey and O'Malley with the additional sixth stage introduced by Levac et al. [38, 39]. The methodology also drew on the Joanna Briggs Institute's methodology for scoping reviews, to improve the rigour of the review process [40]. The six stages followed in conducting this scoping review were: 1) identifying the research question, 2) identifying relevant studies, 3) selecting studies, 4) charting the data, 5) collating, summarizing, and reporting the results, and 6) consultation with relevant stakeholders [38-40].

1. Identifying the research question

After consulting with the research team members, the following research questions were determined to guide this scoping review:

1. What types of integrated primary oral health care program have been developed worldwide to address the need of Indigenous communities? 2. What were the approaches and outcomes of these programs from the two-eyed seeing concept?

2. Identifying relevant studies

The search strategy was developed with the help of an academic librarian at the University of Montreal. The eligibility criteria for the search strategy were developed according to the PCC (Population-Concept-Context), as described by the Joanna Briggs Institute [40]. PCC for this review included publications on integrated primary oral health care services involving Indigenous populations from all around the world, irrespective of study design. Any study protocols, abstracts, opinions, editorials, letters, or commentaries were excluded from the review.

The three-step search strategy recommended by the Joanna Briggs Institute was followed. The initial limited search was performed on Ovid Medline and analyzed text words in the title, abstract, and keywords of the retrieved articles and refined the key terms (**Table 3**) [35]. Then, the second search was conducted using refined key terms across all the included databases such as

Ovid EMBASE, EBSCO CINAHL, ProQuest Central, Google Scholar, and Indigenous databases such as the Indigenous studies portal research tool (iPortal), National Collaborating Centre for Aboriginal Health, Native Health Database, and Bibliography of Native North Americans. We used the filters developed by the University of Alberta to retrieve studies related to Indigenous people from OVID Medline, Ovid EMBASE, and EBSCO CINAHL [41-43]. The third search step looked for journals focused specifically on Indigenous health but not indexed in the databases mentioned above, such as the International Journal of Indigenous Health, Indigenous Policy Journal, and Journal of Indigenous Well-being. This step was facilitated by a manual search of the reference lists of the selected articles to identify grey literature, and by searching for the websites of relevant Indigenous health organizations.

3. Selecting studies

The study selection process consisted of two levels of screening. In the first level, one reviewer screened the title and abstract of all retrieved citations for inclusion based on the eligibility criteria mentioned above. In case of any uncertainties, the citations were considered for the second level. At the second level, two reviewers independently performed a full-text review to determine the eligibility of citations. Any disagreements between the reviewers were resolved via discussion to reach consensus.

4. Charting the data

A data charting form was developed by the research team to extract relevant study characteristics from selected articles and reports. The following data characteristics were extracted:

a. Descriptive study information (authors, year, title, citation, and country).

b. Further information depends on whether the article includes an integrated oral health program description or a program evaluation (*program descriptions* [type, program strategy, oral health care provision, outcomes if available]; *program evaluations* [study setting, objective, data collection, indicators, outcomes]).

5. Collating, summarizing, and reporting the results

To synthesize and summarize the results, we used the numeral summary of included studies [39] and performed content analysis using a qualitative descriptive approach [44]. With the help of

conventional qualitative content analysis, initial codes were inductively generated from the data through an iterative process and then were grouped into categories. The coded material was cross-checked by a second researcher and minor changes were made based upon discussion. Potential program characteristics, approaches, and outcomes for integrated primary oral health care services were synthesized and mapped from all included publications. Then, the programs were categorized based on the types and extent of dental services.

Afterward, the two-eyed seeing concept was incorporated to interpret and synthesize available evidence on approaches for the integration of oral health into primary health care by "weaving back and forth" between Western/biomedical and Indigenous worldviews [36, 45]. The following definitions of Indigenous and biomedical knowledge guided in identifying the respective approaches. *Indigenous knowledge is community specific as it has developed and evolved over time within a specific and localized context through lived experiences, observations, holistic investigative and problem-solving processes. It has been conveyed orally, symbolically, or through experience, and was embedded in the cumulative experience and teachings of Indigenous people* [46]. By contrast, *biomedical knowledge is based on the principle of positivist inquiry, which places value on knowledge gathered empirically through scientific inquiry and assumes that there is a single truth to be discovered* [46]. Furthermore, both the biomedical eye view and the Indigenous eye view were used to assess the outcome measuring instruments and outcome variables. All the outcomes were then divided into four dimensions: biological, mental, emotional, and spiritual. The use of Atlas.ti software facilitated the analysis. This scoping review follows the PRISMA Extension for Scoping Reviews (PRISMA-ScR) [47] guideline for reporting the manuscript.

6. Consultation with relevant stakeholders

Consulting with stakeholders enriches the comprehensiveness of the review as well as facilitating wider knowledge transfer. For this scoping review, we included academic health care professionals and Indigenous community partners in the research team to consult on the research questions and the search strategy, and to provide input on the data analysis.

4.1.4 Results

Figure 8 outlines the search strategy and article selection. The final search strategy extracted 266 records. After removal of duplicates, a total of 244 publications were screened by title and abstract and 204 publications were excluded as they did not meet the inclusion criteria. A total of 40 publications were screened during full-text review; three relevant articles were added after hand searching the references of the available publications, and 14 publications were excluded. In the end, 29 publications describing 30 programs on integration of oral health into primary care from 1972 to 2019 were included in this scoping review. The selected publications consisted of 15 articles describing primary research (12 quantitative studies, one qualitative study, and two mixed-methods studies), eight original field reports and case studies, five publications describing the application of the framework to the integration of oral health in primary health care in the form of an annual report or manual, and one literature review [25, 48-75]. The quantitative studies included a wide variety of study designs, including cluster randomized trial, non-experimental trial, community trial, intervention study, retrospective study, cross-sectional, and pilot study [50, 52, 56-58, 60-62, 64-66, 75]. These programs were conducted in Australia, the USA, and Canada, mostly in the last two decades. **Tables 4 and 5** outline the characteristics of the included programs and program evaluations respectively.

Characteristics of programs

The following four categories of programs emerged from the analysis and represented the synthesis of the data: oral health promotion and prevention programs (n=13), comprehensive dental services (n=13), fly in, fly out dental services (n=3), and teledentistry (n=1).

1. Oral health promotion and prevention programs

Most of the programs were identified in this category. These programs were essentially targeted at Indigenous children, parents, and caregivers [50, 52, 55, 56, 58, 62-66, 75]. However, the target populations for a few programs involved pregnant women, young adults, people with chronic disease, and the elderly [50, 54, 57, 75]. The strategies for oral health promotion and prevention included culturally relevant oral health education, distribution of oral health aids and equipment,

maternal counselling during pregnancy, and pediatric visits to community hospitals and schools [50, 58, 62, 64-66].

2. Comprehensive dental services

Various Indigenous health services in North America and Australia have integrated oral health into primary care for all age groups via incorporating dental clinics with health care services, providing basic, emergency, specialist, and referral services, and developing oral health prevention and promotion programs [25, 49, 51, 61, 67-69, 71-74]. Bain et al. described feasible integrated oral health care services in all nursing stations and associated satellite clinics for Indigenous people of the Sioux Lookout zone in Canada [48].

3. Fly in, fly out dental services

In these services, health professionals work in remote and inaccessible areas by flying there temporarily. Dyson et al. and Jackson Pulver et al. reported a networked spoke-and-hub model of visiting services and volunteer visiting dentist programs, respectively, in the integrated primary oral health care set-up for Indigenous communities in Australia [53, 59, 60].

4. Teledentistry

The Torres and Cape Hospital and Health Service in Australia has integrated dental telehealth consultation for its rural and remote primary health centers [70].

Approaches for integrating oral health services within primary health services

A variety of approaches have been used to integrate oral health within primary care services, drawing from biomedical as well as Indigenous worldviews. **Table 6** outlines the strategies used in implementing biomedical and Indigenous approaches to integrate oral health into primary health care.

1. Biomedical approaches

These approaches to integrating oral health into primary health care include leadership and governance, administration and funding, capacity building, infrastructure and technology, team work and coordination, and evidence-based practice**.**

i. Leadership and governance

Most of these programs were governed by the collaboration of federal and provincial government agencies, Indigenous health organizations, national health research councils, and academic universities [48, 49, 54-56, 61, 67, 69, 75]. In one program, a non-profit organization also collaborated [50]. These programs were focused on accomplishing aims and objectives mentioned in their action plans, strategic plans, or policy papers [48, 51, 54]. In addition to providing quality service delivery, they also concentrated on providing continuing education and training for dental and non-dental staff [49, 52-54, 56, 57, 60, 62, 65, 66]

ii. Funding and administration

Many programs were financially and administratively supported by governments, Indigenous organizations, and universities [48, 51, 52, 54, 56, 61, 63, 66, 68]. They have developed funding models for facilitating access to oral health services for these communities. These programs highlighted the importance of continued funding for program sustainability [56, 61, 66]. For instance, the lack of continuous financial support adversely affected care continuity in the Aboriginal Children's Dental Program as it resulted in the withdrawal of an Indigenous health worker's (IHWs) job position [61].

Other examples for administration and funding included the provision of free basic oral health services to patients [60, 68, 69] and administrative support for travel and accommodation in the case of visiting specialists [68, 69]. Pika Wiya Health Services also provided transport services for eligible clients for X-rays and medicine [51], and *to and fro* transport services between school and dental clinic for children and parents. In the Maari ma region, oral health services are provided by dentists, dental assistants, and trained Indigenous dental assistants, but if there are no dentists then fly in, fly out services, or volunteer dentist services are arranged [68]. These administrative supports enhanced access, care continuity, as well as coordination among professionals [60, 61, 68, 69].

Moreover, many organizations incorporated preventive oral health programs into public health programs such as the Community Nutrition Program, well-baby program, maternal and child

health program, healthy start program, or the chronic disease program, to enable increased accessibility for outreach oral health services [50, 54, 67-69, 72].

iii. Capacity building

Various programs emphasize developing training sessions for non-dental health professionals and IHWs [52-54, 56, 57, 60, 62, 65, 66]. In one program, primary health care providers were trained for oral health care assessment [65]. In some cases, these professionals successfully completed the *Smile for Life* curriculum, which is focused on providing educational resources for integrating primary oral health care [65]. This program also suggested that integrated oral health services also facilitate inter-professional collaboration [65]. Similarly, in the *Brighter Smiles* program, pediatric residents were trained by attending at least one day with dental staff at the Children's Hospital, as well as academic sessions on dental health topics [52]. Interprofessional dental training also helped in making non-dental primary care providers aware of their role in improving people's oral health [52].

iv. Infrastructure and technology

These programs have developed an infrastructure that supports integrated primary dental services [48]. For instance, several programs made provision for a dental clinic with primary health service facilities [25, 48, 51, 59-61, 65, 67, 69, 72, 73]. This facilitated accessible integrated care in these programs. Likewise, in the Sioux Lookout project, a dental clinic was developed at one nursing station, and at least basic dental facilities were provided at all nursing stations and some satellite centres [48]. The Indian Health Services in the USA has developed hospital-based and ambulatory health care centre based dental clinics [49].

Similarly, the use of technology in the form of shared electronic health records helps in coordinating and facilitating the wide range of information for patient follow-ups and referrals, access, cost, productivity, as well as quality assurance [67, 73]. Examples include the *Internet-Based Electronic Patient Management System – Communicare* at Nganampa Health Council Dental Program, which utilizes shared electronic health records, and the *Resource and Patient Management System* at Indian Health Services in the US. In addition, some organizations are working on e-oral health technology, especially to integrate tele-dental consultations for their rural and remote primary health centres [70].

v. Team work and coordination

These programs involved effective team work and interprofessional coordination among dental care providers (dentist, dental hygienist, dental therapist) and other health workers including IHWs, nutritionists, pediatricians, other clinical staff, and teachers in the case of school services, as well as administrators [50-54, 56, 58-61, 63, 65-68]. For instance, the Maari ma program operated with a vision of providing a coordinated family-based approach through an integrated multidisciplinary team of health care providers [68].

Oral health assessment by non-dental primary health care providers facilitated interdisciplinary coordination and referral services [65]. Some programs appointed a manager, liaison officer, or regional coordinator for facilitating coordination and management of oral health services and linking all stakeholders [48, 54, 62, 66].

Smooth coordination and cooperation among personnel from multiple organizations are vital for the program's success. For example, a funding model for the Aboriginal child dental program at Pika Wiya Health Services was successful due to proper coordination among three organizations, namely, South Australian Dental Service, Pika Wiya Health Services, and the Spencer Gulf Rural Health School [61].

vi. Evidence-based practice

The biomedical world is scientific and believes in only one truth relying on scientific laws. By contrast, the Indigenous worldview relies on beliefs and a spiritual world and can include multiple truths based upon individual experiences. The "biomedical eye" view for this project suggested that the selected programs were implemented and evaluated based on evidence-based literature [54, 56, 61, 63]. Implementation of these programs was decided based on evidence of poor oral health knowledge, oral health status, inadequate access to dental services, and need for such primary oral health care services [56, 69, 75]. Furthermore, their execution was also influenced by evidence of integrated good quality and culturally adapted primary health and oral health care services in improving Indigenous health and oral health status [61, 76].

2. Indigenous approaches

Indigenous approaches to integrated oral health into primary health care were categorized as: vision for holistic health, culturally appropriate services, community engagement, shared responsibility and partnership, and cultural competence.

i. Vision for holistic health

Most of these programs in Indigenous communities have a vision and mission to achieve holistic health wellness by working together in a multidisciplinary health care model [25, 54, 63, 67-75]. This concept of holistic health is highlighted, with a focus on biological, mental, emotional, and spiritual wellnesses of individuals, families, and communities at a larger scale.

ii. Culturally appropriate services

Along with a vision to provide holistic health, incorporating cultural values and beliefs was considered necessary in most programs [25, 54, 63, 67-72, 74]. Moreover, some Indigenous health organizations consider the culture to be at the centre of all health care activities and acknowledge "culture as treatment" in tackling health and oral health problems among Indigenous populations [69, 71].

iii. Community engagement, shared responsibility, and partnership

Community ownership and community-based partnerships were considered essential elements for these programs' success [50-56, 60, 61, 63, 64, 66-68, 74]. Indigenous communities should give their consent to participate in the program [55, 56]. From the beginning of program design, they were involved in managing and making decisions about the ongoing programs [55, 56, 61]. These approaches emphasize the development of culturally relevant programs by Indigenous people for Indigenous people [25]. Also, these approaches have been associated with the sustainability of such programs and positive health outcomes [25].

iv. Cultural competence

Community capacity building is one of the guiding principles for developing partnerships with Indigenous populations. It involved trained local community health workers who facilitated the

provision of culturally appropriate services [51, 55, 60, 61, 64] and consequently improved program participation and acceptance by community members [55, 61]. These local health workers act as a link between primary health care providers and community members [53, 56, 59-61, 67]. In most cases, the trained IHWs participated in delivering oral health education and counselling for children and families [50, 55, 56, 62-64, 66], helped in children's oral examination by lifting the lip [66], designed and distributed culturally specific oral health promotion aids [63, 66], scheduled dental appointments [55, 56], and applied fluoride varnishes [55, 56]. In some cases, they visited participants' homes for oral health education [56, 63, 66].

Program outcomes

As per two-eyed seeing guiding principles of Indigenous research, the program outcomes are described from biomedical and Indigenous perceptions. Among all selected programs, a few were focused on reducing early childhood caries [55, 56, 62, 64-66]; however, others aimed to improve overall oral health status and oral health knowledge of children [50, 52, 58, 61, 63].

Outcomes from Western biomedical approaches and Indigenous approaches

We found that the selected studies intended to report their outcomes considering biomedical approaches and did not take into account the holistic outcome variables from Indigenous approaches. For these outcome measurements, data were collected via questionnaires, oral health screening and assessment, observation, interviews, patient records, online surveys, and financial analysis. The outcome variables included change in oral health status, oral health knowledge, attitude, and behaviour of Indigenous participants, perception of care providers, change in types of dental services, and cost-effectiveness.

In assessing these available outcomes from the Indigenous eye, the outcomes were divided into four dimensions, namely, biological, mental, emotional, and spiritual. The biological (dental health-related) dimension included outcomes related to change in dental status, types of services, and accessibility of these services. The mental dimension corresponded to change in oral health knowledge, and attitude of Indigenous participants and care providers, whereas the emotional dimension reported changes in behaviour and perceptions around primary oral health

care. However, this review did not identify any study measuring the spiritual dimensions of primary oral health care services.

i. Biological (dental health-related) outcomes

Overall, the programs were found to be effective and feasible [48, 50-52, 56, 61]. The selected integrated oral health programs improved oral health care access and oral health status of Indigenous children and parents [50, 54, 58, 63, 66, 68]. These programs improved preventive treatments compared to restorative or rehabilitative treatments for children [52, 61]. They also resulted in increased children's oral health assessment, preventive services, and referral services by primary care providers [61, 65, 67, 70]. However, one program demanded more coordinated and referral programs to combat persisting dental caries, periodontal problems, and edentulousness [67].

Furthermore, two cluster randomized control trials of oral health promotion interventions on maternal counselling and oral health promotion found fewer caries among children in test groups. Nonetheless, these trials did not find a significant difference among test and control groups in relation to children's caries prevalence and caregivers' oral health behaviour [62, 64]. However, explanatory analysis for these trials reported better treatment effect with increased numbers of maternal counselling interventions and recommended the use of culturally appropriate interventions to reduce severe dental caries in Indigenous children [62, 64].

Provision of visiting dentist services in remote areas improved access to dental care, reduced waiting lists, and met communities' oral health needs [59]. The visiting dentist program was also recognized to be effective by administrators, care providers, and patients in terms of addressing community oral health needs, offering continued services, and improving the availability of health workforce [59]. Dyson et al. reported on a networked spokes-to-hub model of visiting services as cost-efficient in delivering oral health care in rural Indigenous areas [60].

ii. Mental outcomes

These program results suggested improved perceived oral health knowledge and behaviour among children and their caregivers as well as improved access to oral health care [55, 63].

iii. Emotional outcomes

Most of the programs were well accepted by the Indigenous communities and reported satisfaction among community members [51, 54, 57, 58]. Interprofessional training programs for Indigenous primary health providers were effective and appreciated by these trainees [57].

4.1.5 Discussion

The evidence from this study implies that integrated primary oral health care programs can improve Indigenous oral health-related outcomes. Integrated primary health care has the potential to combat health and oral health care disparities among Indigenous populations, as integrated care offers coordinated care for multimorbid conditions prevalent in Indigenous communities [77, 78]. The concept of primary health care comprises a holistic view of health that goes beyond the narrow biomedical model and includes biomedical, psychological, and social dimensions of health and wellbeing [23, 79]. It is conceptualized as person-focused and population-based care [80, 81]. Likewise, integrated care also incorporates a biopsychosocial and spiritual model of health care services and focuses on patient-centered care [77, 78].

Among the various approaches available for literature reviewing, we found the scoping review most suitable in performing this study, considering the aim mentioned. The scoping review allowed broad and thorough mapping of the available literature on the integration of oral health into primary care in the Indigenous context, irrespective of quality of the literature [38, 40]. Furthermore, the use of two-eyed seeing as a guiding principle in the scoping study facilitated a thorough analysis of the data and acknowledgment of Indigenous knowledge and culture and their impacts [45]. This approach has the ability to better recognize the health challenges in Indigenous populations [82]. Two-eyed seeing offered a platform to non-Indigenous researchers by providing them the opportunity to understand traditional knowledge and culture [83].

This scoping review draws together evidence mapping of the types and outcomes of integrated primary oral health care models in Indigenous communities and also identifying the essential approaches for integrating health care services for Indigenous populations in these models. Our results suggest that community-based and culturally appropriate integrated primary oral health

care programs were successful in improving oral health status and knowledge of Indigenous communities, especially in rural and remote areas. This review identified four types of programs for integrated primary oral health care in Indigenous populations: oral health promotion and prevention programs; comprehensive dental services; fly in, fly out dental services; and teledentistry. The approaches from the biomedical worldview included governance and leadership, administration and funding, capacity building, infrastructure and technology, teamwork and coordination, and evidence-based practice. Approaches from the Indigenous eye included a vision for holistic health, culturally appropriate services, community engagement, shared responsibility and partnership, and cultural competence. These programs mainly evaluated biological, mental, and physical outcomes, with no measure of spiritual outcomes. **Figure 9** illustrates the two-eyed seeing view of approaches and outcomes of programs on integrating oral health services within primary health services. Evidence on approaches and outcomes of integration of oral health into primary care in the general population is consistent with our results [34, 35, 84]. The identified approaches of the integrated primary oral health care interventions extended from the micro to macro level of integration in the form of colocation, interprofessional coordination, interprofessional training and education, integration of oral health into public health programs, financial support, shared health records, cultural safety, and shared vision and mission [80, 81]. Our results also correspond to the most common values of integrated care described by a recent systematic review by Zonneveld et al. [85]. According to Leutz's concept of levels of integration (linkage, coordination, and full integration), most of the selected programs correspond to the level of linkage and coordination [86]. Programs at the linkage level focused on identifying and managing urgent oral health needs, referral, and follow up [86]. Some programs were identified at the coordination level in terms of smooth service transition, information exchange, suitable financial model, and full population coverage [86].

Various health systems around the world embrace integrated care as a potential way to address the rising demand for better health-related outcomes and patient experiences, specifically for chronic and multimorbid patients [87]. As per previously reported literature review, the characteristics of integrated health care systems include value-driven governance & leadership, hospital/physician alignment, financial integration, clinical integration/care coordination, information

continuity, patient-centered & population-health focused, and continuous quality improvement & innovation [88]. Our results are in line with these characteristics, highlighting their influence on the integrated primary oral health care services in Indigenous populations. The available evidence suggests that there cannot be one single model that best supports integrated care. Instead, the integrated health care model can only be successful if it is adapted to the needs and characteristics of the local population [87]. Considering the Indigenous eye view, the provision of culturally appropriate services was identified specific to Indigenous settings. Thus, the characteristics mentioned above offer better integrated services to these settings by incorporating culturally relevant services. Our results also correspond to the eight characteristics of Indigenous primary health care service delivery models identified by Harfield et al.: culture, accessible health services, community participation, continuous quality improvement, flexible approach to care, culturally appropriate and trained workforce, holistic health care, and self-determination and empowerment [16].

The Indigenous primary health care models emphasize the role of culture in health care service provision, in contrast to conventional biomedical models of primary health care that do not specifically signify cultural aspects in care delivery [16]. Strategies to integrating culture included Indigenous communities' ownership, empowerment, and capacity building, as well as provision of culturally relevant oral health services. Previous studies have also identified the key role of Indigenous communities' ownership, empowerment, and self-determination in improving their local health services and health outcomes [16, 89, 90]. Indigenous health service organizations such as Aboriginal Community-Controlled Health Organisations or Indian Health Services prioritize working on the principle of Indigenous peoples' right of ownership and participation [16, 73, 91].

Cultural importance in Indigenous integrated primary oral health care delivery in our results is in line with previous integrated health care services and programs [16, 77, 78]. The role of IHWs strengthened the integration of culture in included programs. However, these workers were given a variety of titles, such as Aboriginal Health Workers, community health representatives, community oral health specialists, Children's Oral Health Initiative Aides, or strained nutrition

educator [50, 54, 55, 60, 62, 63, 66, 69, 91]. Moreover, training of IHWs is a sustainable and cost-effective solution as such training incurs less cost compared to the travel costs required for regularly visiting dentists [66].

In some cases, fly in, fly out services were considered relevant to Indigenous communities with a lack of dental care providers [59, 60]. It is possible that services of this sort may not be coherent with the Indigenous core values [59]. However, the continuous presence of local health providers outweighs the problem of discontinuity associated with fly in, fly out services and visiting dental services [59, 69]. These services are successful in the short term but should not be considered as a permanent solution for improving Indigenous oral health services [59].

The approaches identified in this review were associated with some barriers that adversely affect the integration of primary oral health care. These barriers were: difficult human resource management, administrative barriers, difficult communication, and discontinuity of care. Difficulty in human resource management involved workforce shortage [56], high staff turnover in rural and remote areas [62, 66], and intermittent services due to fly in, fly out staff or visiting staff in rural areas [59]. Administrative barriers included irregular or lacking financial resources [56, 61, 66]. Barriers posed by difficult communication and discontinuity of care were associated with difficulty in contacting patients or caregivers [61] due to frequent change of mobile phone numbers and addresses [66], cultural and traditional *move around* [66], lack of understanding of the importance of dental care [61], and low oral health literacy among community members [61].

Strengths and limitations

This scoping review, to our knowledge, is the first study to assess integration of oral health into primary health care in Indigenous communities. Another strength is that this is a systematically performed review using a robust methodology that ensures the transparency of the findings. Moreover, this scoping study was Indigenously adapted by applying two-eyed seeing in assessing the evidence.

There were a few limitations in this scoping review. First, the review could not include publications in languages other than English and unpublished data. As well, quality assessment could not

be performed due to the nature of this review, as it involved a variety of studies, including program descriptions.

Study relevance and future research

Our results, nevertheless, may be of interest to Indigenous communities globally that are seeking to improve their health and oral health status. This review contributes to the development and operationalization of the best integrated primary oral health model for Indigenous populations.

Our scoping review reflects the need for more contribution of traditional knowledge and culture in integrating oral health services. Most of the programs aimed to provide at least basic dental services to the Indigenous populations, especially those in remote areas without access to dental services. Though some programs emphasized Indigenous community involvement and ownership, their involvement was limited and varied among the programs. This suggests developing more shared space among Indigenous and non-Indigenous partners for strengthening integrated oral health care services. This might include participation in community activities and ceremonies such as sweat lodges, more involvement of elders and spiritual people, or more adoption of culturally sensitive healing practices.

Some included program descriptions did not describe performance evaluation, and this information gap constrains the comprehensive understanding of the extent of integration and its impact. Hence, there is a need for a comprehensive longitudinal evaluation of integrated primary oral health care intervention. Among selected program evaluations, a variety of outcome measures have been used. This points out the need for developing validated uniform measurement tools to evaluate integrated health care system performance. Furthermore, our results also identified the lack of validated indicators for measuring holistic oral health, in comparison to indicators available for biomedical oral health. This paucity warrants the development of indicators for better assessment of holistic oral health.

This review primarily identified integrated primary oral health care programs in North America and Australia. Nevertheless, there is a need to implement and conduct a subsequent evaluation of similar programs for Indigenous populations in other parts of the world, such as Asia, Africa, Europe, and South America.

4.1.6 Conclusion

Study results suggest that implementing programs on the integration of oral health into primary health care has the potential to improve oral health-related outcomes for Indigenous populations. The array of approaches to integrated primary oral health care identified from the two-eyed seeing concept is relevant for Indigenous communities, with a particular emphasis on cultural integration. Most of the programs considered the variable degree of integration; however, more comprehensive integrated oral health care programs incorporating the holistic concept of health and oral health care are needed, to realize full effectiveness in Indigenous populations.

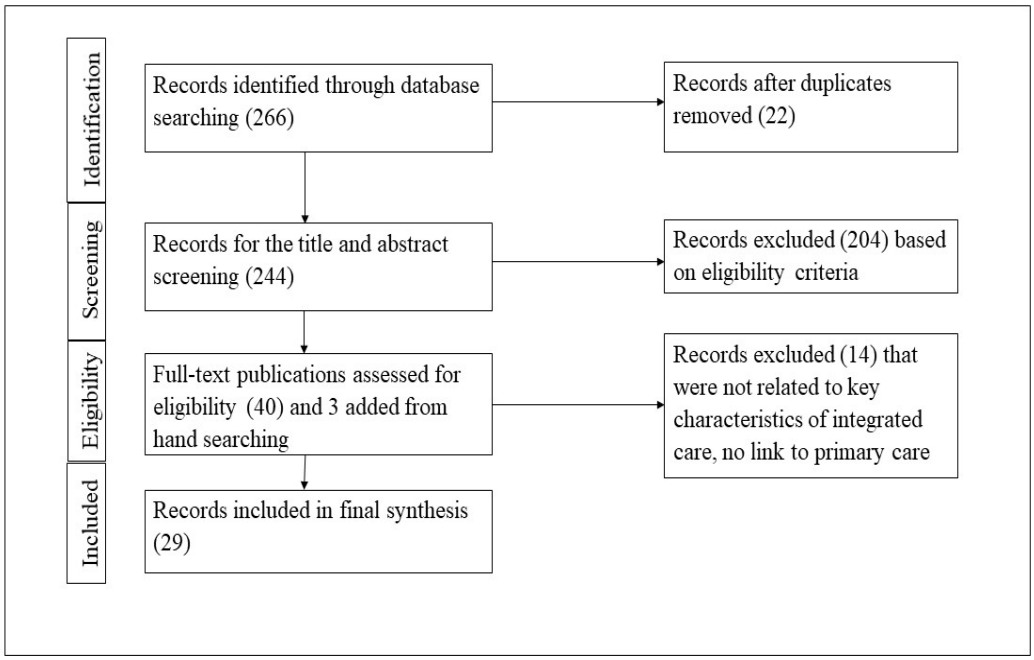

Figure 8. Flow of study selection

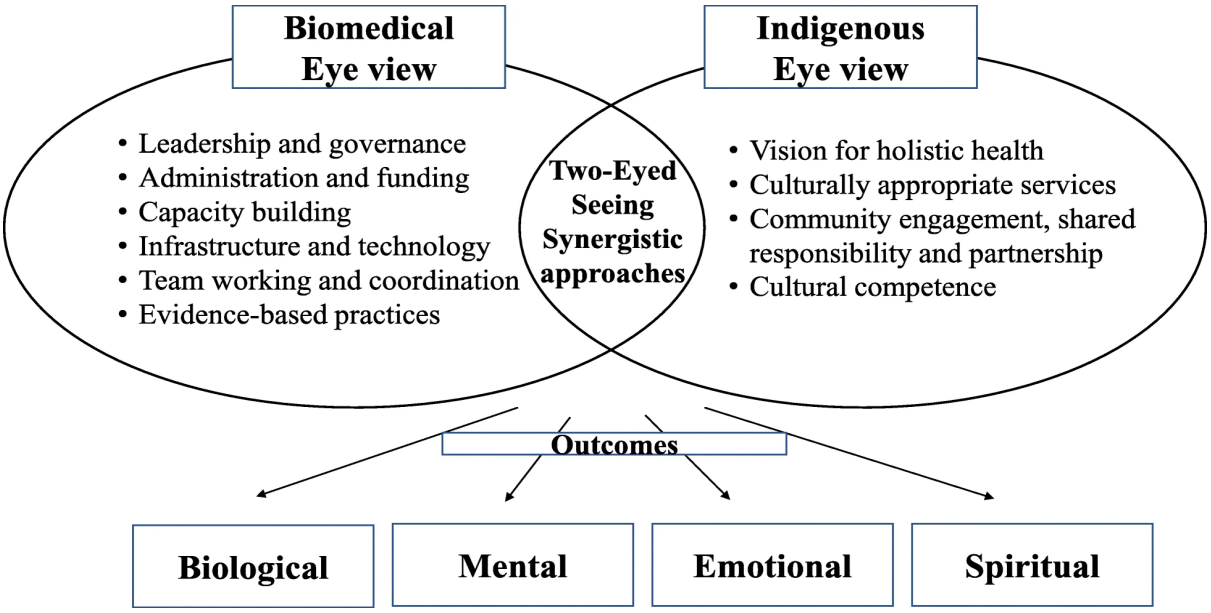

Figure 9. Flowchart illustrating two-eyed seeing view of approaches and outcomes of programs on integrated primary oral health services

Table 3. Medline search strategy

#	Searches
1	(indigenous or aboriginal or "first nations" or metis or inuit*).mp.
2	('Alaska* native' or 'native Alaska' or 'native American' or Mohawk or ojibw* or cree or dene or maori or 'torres strait islander*').mp.
3	Athapaskan.mp. or exp Indians, North American/ or exp Inuits/ or exp Health Services, Indigenous/ or exp Ethnopharmacology/ or Saulteaux.mp. or Wakashan.mp. or Cree.mp. or Aboriginal*.mp. or Indigenous*.mp. or Metis.mp. or off-reserve.mp. or onreserve.mp. or First Nation.mp. or First Nations.mp. or Amerindian.mp. or (urban adj3 (Indian* or Native* or Aboriginal*)).mp. or ethnomedicine.mp. or country food*.mp. or residential school*.mp. or (exp Medicine, Traditional/ not Chinese.mp.) or exp Shamanism/ or shaman*.mp. or traditional medicine*.mp. or traditional heal*.mp. or traditional food*.mp. or medicine man.mp. or medicine woman.mp. or autochtone*.mp. or (Native adj1 (man or men or women or woman or boy* or girl* or adolescent* or youth or youths or person* or adult or people* or Indian* or Nation or tribe* or tribal or band or bands)).mp.
4	1 or 2 or 3
5	exp Dental Health Services/
6	Oral Health/
7	Dentistry/
8	Oral Medicine/
9	exp Preventive Dentistry/
10	exp Dental Facilities/
11	exp Diagnosis, Oral/
12	Stomatognathic Diseases/
13	exp Mouth Diseases/
14	exp Tooth Diseases/
15	Pediatric Dentistry/
16	exp Dentists/
17	Community Dentistry/
18	(dentist* or stomatology or Dental Prophylaxis or Fluoridation or Oral Hygiene or Oral Health or Dental Facilities or Dental Clinic* or Dental Office* or Oral Diagnos* or Mouth Disease* or Tooth Disease* or Dental Disease* or Dental Health Service* or Dental Service* or pedodontics).mp.
19	5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18
20	exp Primary Health Care/
21	Primary Care Nursing/
22	Primary Nursing/

23	Physicians, Primary Care/
24	(Primary care or Primary health care or Primary healthcare or Primary Nursing).mp.
25	20 or 21 or 22 or 23 or 24
26	exp "Delivery of Health Care, Integrated"/
27	exp Community Health Services/
28	(community care or community health care or community healthcare).mp.
29	26 or 27 or 28
30	Community Integration/
31	systems integration/
32	(Integrat* or Interprofessional or multidisciplin* or interdisciplin* or cooperat* or collaborat* or coordination*).mp.
33	((Cross or multi or inter) adj (profession* or Disciplin*)).mp.
34	30 or 31 or 32 or 33
35	4 and 19 and 25 and 34
36	Limit 35 to (English)
37	(4 and 19 and 29 and 34) not 35
38	Limit 36 to (English)

*Derived from Hermina et al. 2017 [35]

Table 4. Characteristics of included programs on integrated primary oral health care in Indigenous communities

Author, year and country	Type of program	Program strategy	Oral health care provision
Bain and Goldthorpe, 1972, Canada [48]	University of Toronto's Sioux Lookout Project	• Collaborative services for Cree and Ojibway people in Sioux Lookout region involving multidisciplinary health services including dental services	• Development of dental clinic at one nursing station • Basic dental facilities in all nursing stations and some satellites • Dental care provided by dentists and interns • Development of caries prevention program **Outcomes:** Program was found to be feasible after 3 years.
Chiarchiaro G, 1997, USA [49]	Indian Health Service in Oklahoma	• Oklahoma dental program as part of integrated health care system	• Clinic-based dental services and community-based oral health promotive and preventive services • Population based program such as for school children, people with special needs • Multidisciplinary team working with cleft palate team
Lawrence HP, 2004, Canada [50]	Community-based dental-hygiene coordinated Prenatal Nutrition Program	• Community-based dental preventive program for Early childhood caries at Sioux Lookout Zone performed by Woman and Child Community Nutrition Program workers • Cross-sectional survey was conducted among 2- to 5-year-old Anishnaabe children from 16 communities where 8-8 communities were identified as high-low intervention communities based on frequency and coverage of health worker and participants contact	• Trained health workers provided culturally sensitive nutrition and dental preventive education to pregnant women, new mothers, and elders raising children during home visits • Promotion of healthy food, optimal oral hygiene practices via head start brushing • Reinforcement of healthy dental care practices by nurses during Well Child Clinics • Offered oral educational packages to caregivers • Media campaigns and distribution of posters and pamphlets • Smoking cessation sessions ***Outcomes:*** • Overall positive outcomes • Improved hygiene and reduced number of decayed surfaces • Improved oral health knowledge and preventive practices of caregivers and less untreated carious teeth significantly higher among the high-intervention communities • But still higher demand for dental services under GA
Parker EJ et al, 2005, Australia [51]	Oral health program by Pika Wiya Health Service Inc.	• Implementation of the first phase of the program in 2001 to develop culturally relevant quality oral health care services	• Provision of dental services for eligible adults 2 days per week • Oral health promotion at schools' festivals and Pika Wiya health service open days.

			• Referral for patient transport services to radiology department and local pharmacy ***Outcomes:*** • Program was successful • More satisfied community members
Harrison RL et al, 2006, Canada [52]	Brighter Smiles	• This participatory research program aimed to improve children's oral health in a Hartley Bay First Nations community by providing service-learning experience to paediatric residents	• Oral health care provision via classroom teachings, school-based brushing, fluoride application, and regular visits by UBC paediatric residents for well-child care. ***Outcomes:*** • Service-learning experience was successful • More preventive treatments were offered compared to restorative or rehabilitative treatments
Kruger et al, 2010, Australia [53]	Case study	• To discuss 10 years experiences of Centre for Rural and Remote Oral Health in Western Australia	• Oral health services via developing vertically integrated service, education and research driven model • Co-location • Provision of Fly-in and fly-out services • Symbiotic relationship among health and dental care providers that creates a supporting environment • Interprofessional collaboration • Culturally relevant services by involving IHW • Interprofessional education
Meihubers S, 2013, Australia [54]	Bila Muuji Oral Health Promotion Partnership Program	• Bila Muuji Aboriginal Health Service initiated this program involving primary care workers at Aboriginal Community Controlled Health Organisations • Target groups: children less than 5 years, school-aged children, young adults, people with chronic disease, and the elderly	• Appointment of oral health promotion coordinator • Oral health promotion programs including school-based daily toothbrushing, oral health information sessions; training primary care staff. ***Outcomes:*** • Continuing • Positively accepted by the community • Improved oral health profiles
Mathu-Muju KR, 2016, Canada [56]	Children's Oral Health Initiative (COHI) – Community-based preventive program for First Nations and Inuit children	• Its short-term aim was increase access to preventive oral health care services and long-term outcome to decrease levels of dental disease. • Conducted by Dental hygienists and therapists under Health Canada for Aboriginal communities and COHI aide	• Preventive oral health care services included fluoride varnish, pit and fissure sealants, oral health counselling and atraumatic restorative therapy. • COHI aide helps in explaining program purpose to parents and obtains inform consent, oral health education, schedule dental appointment as well as fluoride varnish application. ***Outcomes:*** • Program has been successful

		(trained community health workers) • Target groups: preschool children, school children, parents/primary caregivers, and pregnant women	• It extended to 320 communities over a period of 10 years from 2004 to 2014 along with increase in number of participating children.
Wooley S, 2016, Australia [67]	Nganampa Health Council Dental Program	• Commenced in 1986 to provide accessible, appropriate and effective oral health	• Oral health care via 2 dental operatories at health clinics, mobile dental units (dental truck) and portable dental equipments • Oral health services included promotive services, emergency Service, school dental program, adult dental program, special needs, and prosthodontics. ***Outcomes:*** • 100% rate of sealants and varnishes in children. • More dental caries in children at 6 years, lesser DMFT in 12 years children and more restorative unmet needs, diabetes associated periodontal diseases and edentulousness in adults, • Still challenges were existing and necessitates further coordination and referral programs.
Maari Ma Health Aboriginal Corporation, 2016, Australia [68]	Evaluation of Maari Ma Health Aboriginal Corporation's Chronic Disease Strategy	• Integration of oral health into health programs 'Healthy start' and 'Keeping well program' • 'Clean Teeth Wicked Smiles' oral health promotion program for school-aged children • 'Tiddilicks' program for preschool children promoting tooth brushing and drinking water rather than fizzy drinks • Incorporation of oral health into health screening, fluoride varnish and fissure sealants application • Fluoride varnish application as part of GP's child health checks • 'Filling the Gap program': volunteer dentists visit for 1–2-week period	• Promotion and prevention of oral health via public health dentist, dental therapist and Indigenous dental assistants • Treatment done by dentist ***Outcomes:*** • 'Clean Teeth Wicked Smiles'- significant increase in the number of children brushing twice or more a day • Significant reduction in decayed primary and permanent teeth in children
Cree Board of Health and Social Services of James Bay, 2004, Canada [69]	Cree Board of Health and Social Services of James Bay developed the Strategic Regional Plan 2004-2014	• Implemented an integrated delivery of health and social services in the Cree communities including integration of oral health into primary care	• CBHSSJB has developed a separate dental clinic in each Community Wellness Centre in all communities • Provision of free services by dentists and dental hygienists

			• Preventive oral health programs carried out by various dental and non-dental healthcare providers
Torres and Cape Hospital and Health Service, 2018, Australia [70]	The Torres Strait Primary Oral Health Care Project 2017-2019	• Aimed to develop oral health roles for remote primary health providers by integrating oral health assessments and first response duties within remote Primary Health Care Centres via telehealth technologies	• Use of videoconferencing by the dental team at Thursday Island hospital to train and support health care providers at rural and remote primary health care centres in their oral health activities as well to facilitate communication and clinical consultations among them ***Outcomes:*** • Program's implementation phase resulted in improved oral health assessment and promotion by primary care providers
Ontario's Aboriginal Health Access Centres [71]	Waasegiizhig Nanaandawe'iyewigamig	• Provision of comprehensive primary health care services to its first nations communities including travelling health care providers to remote areas	• Health promoters with dental hygienist include offer promotive and preventive oral health services including via COHI
Ts'ewulhtun health centre annual report 2017-18 [72]	Ts'ewulhtun health centre, BC, Canada	• Offer primary health services to Cowichan tribes	• Co-located dental clinic • Offer oral health education, prevention and restorative treatment to all community members including COHI • Oral health promotion within public health programs
Sts'ailes primary health care project: report, 2013 [25]	Nisga'a Valley Health Authority (New Aiyansh, BC)	• Offers primary health services to Nisga'a communities	• Co-located dental clinic
Sts'ailes primary health care project: report, 2013 [25]	Anishnawbe Health (Toronto, ON)	• Offers primary Health Care Services by a multidisciplinary team, including dentist	• Offers promotive, preventive and clinical dental services • Delivers Healthy Smiles Ontario Program
Southcentral foundation's Nuka System of Care [25, 74]	Alaska Native and American Indian people in the Anchorage Service Unit area	• Integrated primary health care model with wide range of health services including dental services	• All types of dental services
Indian health services [73]	Federal health services to American Indians and Alaska Natives	• Integrated dental services with other health care services	• Ranges from basic and prevention services to all dental treatments

Table 5. Characteristics of included program evaluations on Integrated primary oral health care in Indigenous communities

Author, year and country	Type of Study/ Study objective	Setting	Data collection	Indicators	Study outcomes
Pacza T, et al. 2001, Australia [57]	Pilot study/ To develop IHW training program with the proper teaching methodologies assuring its effective delivery and to assess students' experience	• Pilot training program developed as a prerequisite to a culturally appropriate preventive oral health program • Conducted as series of modules at two Indigenous training schools	• Observation • Questionnaires	• Program effectiveness • Students' feedback	• Program was effective and identified considering 10 students per trainer • Students were satisfied and considered this training relevant to their needs.
Macnab AJ, et al, 2008, Canada [58]	Intervention Cross-sectional study/ To improve oral health and oral health knowledge among school children	• Community visits by a team of 2 trained medical residents with one supervisor • Integration of oral health program with well-baby and well-child clinic • Incorporation of regular toothbrushing sessions, fluoride rinse and varnish application and dental health anticipatory guidance and classroom presentation by residents	• Pre-post intervention examination by dentist • Community feedback	• dmfs/DMFS • Caries free status • Questionnaire on oral habits • Subjective community experience	• dmfs/DMFS measures improved, and caries free children increased from 8% to 32% after 3 years of intervention • Improved oral health behaviours • Community responded positively for the program.
Jackson-Pulver L, et al, 2010, Australia [59]	Program evaluation-Mixed method/ To develop a 'Filling the Gap' - volunteer dental	• Wuchopperen Health Service integrated dental services via a base clinic and mobile dental clinic • Provision of	• Literature review • Quantitative using patient health records and • Qualitative us-	• Episodes and type of care • Effect on waitlist • Stakeholders' perception	• Increased episodes of dental care and enrolment of new patient as well as increased volunteers' visits. • Meeting patient needs and reducing waiting list

	program in partnership with the local community controlled primary health service	visiting volunteer dentists	ing semi-structured interviews	about the program	• Improved workforce development and care continuity
Dyson K, et al. 2012, Australia [60]	Retrospective study/ To examine the cost-effectiveness of networked hub and spoke visiting model of Indigenous rural oral health services	• Integration of dental clinic with Indigenous health services at 5 rural sites	• Financial analysis (Measurement of service provision)	• Costs to value of care ratio (data retrieved records for the years 2006, 2008 and 2010)	• Cost to value ratio was 1.61. • No significant different among 5 sites • Cost to value ratio is similar to Government estimates (1.5-2).
Parker EJ et al, 2012, (Aboriginal Children's Dental Program in Port Augusta) Australia [61]	Intervention study- Evaluation after 3.5 years/ To provide a cultural-friendly dental service	• Dental services by IHW and dentists, also in collaboration with dietician • IHW were trained via dental students at Adelaide's dental school through workshop	• Oral health related hospital records • Informal interviews with health service staff	• Services statistics • Key issues and challenges in the program	• Improved participation rates, increased number of preventive treatments compared to restorative treatments • Key issues and challenges: issues related to consent, cancelled and failed appointments, difficulty in contacting and communicating parents and guardians
Harrison RL et al, 2012, Canada [62]	Cluster-randomized pragmatic trial/ To compare the dental health status of young Cree children whose mothers received maternal counselling with that of children whose mothers only received educational pamphlets	• Oral health related Motivational interview-style counselling by trained community health representatives or local women in test communities • Distribution of educational pamphlets to mothers	• Dental examination • Questionnaire	• Dental caries assessment (Pitts criteria) at 30 months of age • Mothers' dental health knowledge, behaviour and child caries related quality of life	• Low caries prevalence in test group compared to control, but not statistically significant. • No significant difference for maternal oral health behaviours and child quality of life.
Portland District Health, Winda-Mara Aboriginal Corporation,	*Deadly Teeth:* promoting oral health in Gunditjmara country/	• Oral health promotion services for families with children up to 5 years old • Distribution of	• Pre- and post-survey questionnaire over phone	• Culture appropriateness of the program	• 100% services believed that services were culturally appropriate.

2012, Australia [75]	To provide a culturally appropriate oral health promotion service	tip card including eat well, drink well and clean well tip cards			
Willder S et al, 2014, Australia [63]	'Indigie-Grins' program- A community-based oral health promotion program-Mixed method study/ - To assess the oral health status of Indigenous children aged 5-12 years - To develop and provide a culturally appropriate community intervention program	• IHWs helped in recruitment, retaining and education of the children and families during research • They also participated as the principal researcher and designed the culturally specific aid and equipment for oral health promotion	• Oral health assessment by using dental caries and periodontal health indices • Focus group discussion	• Oral health status • Participants' perception and attitude towards oral health (both pre- and post-)	• Improvement in unmet restorative needs, improved periodontal status of children • Improved access, awareness and oral health behaviours of children and parents
Braun PA, et al, 2016, USA [64]	3-year Cluster-randomized community-based trial/ To measure the effectiveness of the program in reducing the caries increment in head start attending Navajo children	• Interventions (oral health promotion and Fluoride varnish application) were provided by trained Indigenous paraprofessionals, named as *community oral health specialists*.	• Oral examination, questionnaires	• Primary outcome indicator: change in dmfs with time • Secondary outcomes indicators: DMFS, caries prevalence, caregiver oral health knowledge and behaviour	• No difference in caries reduction among intervention and control groups • Improved knowledge among care giver at 1 year (but not at 2 and 3 year)
Murphy KL, et al, 2017, USA [65]	Non-experimental quality improvement project/ To integrate and evaluate a pediatric oral health project in an American Indian pediatric primary care setting	• This study involved pediatric and dental clinic at an Indian Health Service hospital • Primary care providers had completed *Smile for Life* Curriculum • They performed oral	• Oral health screening and carried risk assessment using oral health risk assessment tool	• Oral health assessment • Dental referrals	• Around 91% children assessed having high caries risk • 72.4% referral and 74% of these were seen by the dentist

		health screening, caries risk assessment, oral health education for parents and caregivers, and dental home referral			
Mathu-Muju KR, 2017, Canada [55]	Qualitative research / To explore the experiences of First Nations families whose children had enrolled in the COHI program	• COHI – Community-based preventive program for First Nations and Inuit children	• Semi-structured interviews	• Perception of community members whose children participated	• Improved oral health knowledge and behaviour of children and caregivers • Improved access to preventive and restorative services • Promoted continuity of care that facilitated referral and linkages for oral health care
Smith L, et al, 2018, Australia [66]	Community trial/ To evaluate the effectiveness of a dental health education program, *Smiles not Tears,* in preventing Early Childhood Caries in Indigenous children	• IHWs delivered age-appropriate oral health education to families over five visits, screened children and distributed culturally appropriate resources • At 6th visit, dental examination was done by dentist	• Dental caries indices (dmft, dmfs, Sic10 and SiC30)	• Comparison of caries prevalence of children at 30 months of age with children in control group	• More children in test group were caries-free compared to control group

Table 6. Strategies used in implementing Western and Indigenous approaches to integrate oral health into primary health care

Western Approaches	• Development of one integrated dental clinic at one satellite centre for comprehensive dental services, provision of basic dental services at other nursing stations and satellite centres [48] • Basic or Comprehensive dental services [25, 49, 51, 61, 65, 67-69, 72-74] • Community based promotive and preventive dental services (community water fluoridation, school-based programs, pit and fissure sealants, fluoride varnish, education, tobacco counselling, maternal counselling prenatal and well-baby visits) [25, 49-51, 54-58, 61, 63-65, 67-69, 71, 72, 75] • Mobile dental services [59] • E-oral health by rural primary care providers (teleconferencing) [70] • Visiting dentists [59] • Training of non-dental primary care providers on dental health [52-54, 56, 57, 60, 62, 65, 66]
Indigenous Approaches	• Aimed for culturally competent services [48] • Community ownership and partnerships with Indigenous communities [50-56, 58, 60-64, 66-68, 73-75] • Culturally appropriate oral health service such as development of dental education tools in native languages [50, 69], Oral health promotion by interconnecting with the community at their local and cultural events such as circle of wellness program [72], use of Indigenously adapted aids and equipment such as toothbrushes, timers and brushing charts [63], role of elders and family tip cards designed by Indigenous Families and painted by Indigenous artist [75] • Locally trained IHWs [25, 50, 51, 53-57, 60, 61, 63, 64, 67-69, 71, 75] • Cultural training/advice for non-Indigenous health care providers [61, 75]

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4.2 Article 2

Appreciative inquiry in evaluating integrated primary oral health services in Quebec Cree communities: a qualitative multiple case study

Authors: Richa Shrivastava[1], Yves Couturier[2], Felix Girard[1], Christophe Bedos[3], Mary Ellen Macdonald[3], Jill Torrie[4], Elham Emami[3]

[1]Faculty of Dentistry, Université de Montréal, Montréal, Québec, Canada.

[2]School of Social Work, Université de Sherbrooke, Sherbrooke, Québec, Canada.

[3]Faculty of Dentistry, McGill University, Montreal, Québec, Canada.

[4]Public-Health Department, Cree Board of Health and Social Services of James Bay, Mistissini, Québec, Canada.

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4.2.1 Abstract

Objective:

The Strategic Regional Plan of the Cree Board of Health and Social Services of James Bay (CBHSSJB), serving the Quebec Cree communities, mandates the objective of integrating oral health within primary health care. Emerging evidence suggests that the integration of oral health into primary health care can decrease oral health disparities. This research study aimed to answer the following research question: how and to what extent does the integration of oral health into primary health care address the oral health needs of the Cree communities?

Methods:

We used a multiple case study design within a qualitative approach and developmental evaluation methodology. The 4 D model of appreciative inquiry (Discovery, Dream, Design and Destiny) was selected as a study framework among existing frameworks of the developmental evaluation. Maximum variation and snowball sampling were used to identify and recruit participants (health care providers, administrators, and patients). Data collection included focus group discussions and individual in-depth interviews. Data analysis included transcription, codification, thematic analysis, and triangulation.

Results:

A total of 36 interviews and six focus group discussions were conducted. We identified ten themes in discovery and dream phases. The *Discovery* phase identified the strengths of the organization in facilitating enablers of integration including strategic planning, organizational structure, cultural integration, coordinated networks, and co-location. In the *Dream* phase, participants' oral health care stories expressed various dimensions of integration and their wish for strengthening integration via extending public oral health care programs, increasing resources and improving organizational management. In the *Design* phase, recommendations were formulated for a future action plan within the CBHSSJB.

Conclusion:

This study results suggested that the CBHSSJB has been successful in implementing oral health integration into primary care following its strategic planning. At present, the organization could extend the level of integration into full integration by following study recommendations derived from the perspective of local stakeholders.

Strengths and limitations of this study

- Appreciative inquiry is, for the first time, used in the field of indigenous oral health research that allows better recognition of Indigenous culture and values in organisational health services.
- The multiple-case study design helped to gain insight into the integration of dental services into primary healthcare services in Cree communities and enabled the Indigenous participants to enunciate their experiences from a holistic perspective.
- The trustworthiness of the study was ensured through member checking and triangulation of multiple methods, data sources and investigators.
- This evaluation research could be instrumental in developing evidence on optimal implementation of integrated primary oral healthcare model in other similar communities/settings.
- This study might have encountered bias due to various types of study participants such as administrators, healthcare providers and patients.

Keyword

Indigenous populations, Integrated health care systems, Primary health care, Dental care, Health services evaluations, Appreciative inquiry

4.2.2 Introduction

Indigenous communities experience a substantially greater extent of oral health disparities than the general population [1-4]. These disparities are associated with a broad range of social determinants at proximal (such as health and oral health behaviour, education, income), intermediate (health and oral health care systems, educational system, cultural continuity) and distal (colonialism, racism and social exclusion) levels [5]. The oral health disparities within this complex intersection and interrelation of health determinants need to be broadly tackled by system-focused collaborative approaches such as an integrated care approach [6]. Therefore, the integration of oral health care within primary health has been proposed as a strategy for addressing oral health disparities [7, 8].

Integrated care is defined as *a coherent and coordinated set of services which are planned, managed and delivered to individual service users across a range of organizations and by a range of co-operating professionals and informal carers* [9]. Primary oral health care is defined as *the integration of services that promote and preserve oral health*, *prevent oral disease*, *injury and dysfunction and provide a regular source of care for acute and chronic oral diseases and disabilities [10].*

The Cree Board of Health and Social Services of James Bay (CBHSSJB), as a pioneer in the Canadian province of Quebec, implemented a model for the integrated delivery of health and social services [11, 12]. This organization is responsible for providing health and social services to the Crees of Northern Quebec [11]. 'Eeyou Istchee' (the land of the people) is the homeland of the Crees of Northern Quebec who live in 9 communities with a total population of over 18,000 [13]. The CBHSSJB's Strategic Regional Plans 2004-2014 and 2016-2021 mandated a model for the integrated delivery of health and social services in the Cree communities. Henceforth, the integration of oral health within primary health care was one of the specific objectives of this Strategic Planning [11, 14].

Available evidence indicates the gap in knowledge about integrated oral health care programs and their outcomes and supports performing evaluation research to create evidence-based data on this topic [15]. Therefore, this study was conducted in collaboration with the CBHSSJB to evaluate its integrated primary oral health care program.

The research question was: how and to what extent does the integration of oral health into primary care address the oral health needs of the Cree communities? Based on an appreciative inquiry approach [16], the *study objectives* were to **1.** Discover the strengths of the CBHSSJB's oral health care policies in the integration of services; **2.** Explore the Cree communities' members' oral-health experiences and their dreams for oral care services; **3.** Develop recommendations to support planned actions within the communities.

4.2.3 Methods

The study is part of a larger Canadian Institutes of Health Research funded project on Oral Health Integration into Primary Care [17]. We followed the Standards for Reporting Qualitative Research (SRQR) guideline for reporting qualitative studies for writing this manuscript [18]. This study was performed in compliance with the ethical guidelines of Ownership, Control, Access and Possession for First Nations [19].

Study setting

We purposefully selected four Cree communities based on the identification of diverse characteristics such as demography, geography, culture, and oral health care. Each of the nine Cree communities has a *Community Miyupimaatisiiun* (wellness) *Centre* (CMC) [20, 21]. These centres offer a wide variety of health services including dentistry [20, 21]. The CHBSSJB also operates one regional hospital, a regional public health department, homes for troubled youths, Cree Patient Services (Wiichihiituwin) liaison offices as well as human resources recruitment office [21].

Study design

We used a multiple case study design within a qualitative approach and developmental evaluation methodology [22, 23]. A case study is the most common design used in evaluation research that helps in examining contemporary phenomena in real-life situations [22]. Developmental evaluation is useful in adapting an intervention under complex conditions such as health system issues in culturally diverse contexts, where influences from multiple factors make it difficult to anticipate what will happen as the intervention progresses [23, 24].

Among various frameworks of developmental evaluation, we selected Appreciative Inquiry (AI). AI is a philosophical, cooperative and systematic approach for transformational change that

searches for 'what gives life' to the organization, recognizes the best in individuals, organizations, and the world around them to create a better future [25, 26]. We selected AI because it is a success-focused, culturally responsive, and cost-effective framework that encompasses the diverse perspectives and experiences of the stakeholders [27]. The four phases of AI's 4 D model (Discovery, Dream, Design and Destiny) guided this project as illustrated in **figure 10** [16].

Study Phases

1. Discovery This phase included planning meetings followed by an environmental scan. The planning meetings were conducted in the form of a workshop and videoconference that involved several activities such as presentations, focus group discussions (FGD) and interviews [12]. They engaged representatives of Cree community members, health and oral health care service providers, and administrators to solicit their feedback and to facilitate the development of agreement and community consensus on the project evaluation plan [16]. Various evaluation models were also discussed with these stakeholders, and they selected the Five foundations of integrated care [28] as a model for this project evaluation.

The planning meetings were followed by an environmental scan. It comprised observations of four CMCs and a documentation review. The documents were obtained from identified key collaborators and the CBHSSJB website. The environmental scan helped in retrieving background information and clarifying purposes, rationale, historical insight and the most recent information related to the oral health policies at the CBHSSJB [29].

2. Dream Key stakeholders such as administrators, health and oral health care providers and patients at the community Miyupimaatisiiun centers and hospital were asked about their oral health-related experiences, stories, and dreams for the future of oral health care services at the CBHSSJB during FGD and individual interviews [16].

3. Design This phase involved formulating recommendations for deploying the 'dreamed' oral health care at CBHSSJB [16]. The results and recommendations realized through the previous phases were discussed and validated for the stakeholders' review, acceptance, and confirmation during various CHBSSJB official meetings and precisely planned meetings.

4. Destiny This phase was partially incorporated since it included the delivery of recommendations for the action plan to the CBHSSJB in the form of lay and scientific reports.

Sampling and data collection

Maximum variation sampling and snowball techniques were used to identify and recruit participants for data collection [30]. Cree community partners at CBHSSJB helped in selecting potential participants, including administrators, care providers and patients. The maximum variation sampling allowed the emergence of diverse viewpoints. Through snowball sampling, selected participants recommended other potential candidates for the study [30]. The data collection included the environmental scan, FGD and individual in-depth interviews. FGD and individual interviews were conducted in English or French by two research team members trained in qualitative methods. Data collection continued until saturation was achieved [30]. The semi-structured interview guide was developed based on the *Rainbow model of integrated care* and *AI,* which was tailored based on the participants' profiles (Supplementary file 1) [27, 31]. Accordingly, based on the Rainbow model, we included questions on each dimension of integration, and based on AI, we involved questions focusing on successful processes and outcomes of integration [27, 31]. The interviews, on average 40 minutes in length, and FGD, on average one hour and 15 minutes in length, were conducted between January 2016 and December 2017 in a quiet room at the Miyupimaatisiiun centers or hospital. They were digitally recorded and transcribed verbatim as text documents.

Data Analysis

The study used the community as the unit of analysis. This research combined the *Rainbow model of integrated care* and the *Five Foundations for Integrated Care model* as conceptual frameworks for analyzing the data [28, 31]. This data analysis was inspired by multiple case study analysis by Yin [22] and Miles and Huberman [32]. At first, the data analysis was conducted at the within-case level to explore and describe the findings for each case. This was followed by cross-case analysis to identify similarities and differences across the cases to synthesize the findings and draw conclusions as a whole [32, 33].

Data analysis included transcription, debriefing, codification, data display, thematic content analysis, and triangulation [34]. Raw data was coded and analyzed both within and across cases using ATLAS.ti, a qualitative analysis software. Recordings and quotations from collected data were de-identified to ensure the participants' and communities' confidentiality. All transcripts were read and re-read, and initial coding was conducted. We developed a coding list based on the coding of the first few transcripts and was discussed with the team members to bolster the consistency of the data interpretation as well as the coding strategy.

Mixed deductive and inductive approaches were used to identify themes. Conceptual frameworks were used to develop themes deductively, whereas new themes from the data were identified inductively. The codes were collapsed to potential themes and final themes via an iterative process by critically analyzing concepts and linking them across the data. Word table and matrixes were used to visually examine and synthesize the data for each case and across cases. Any differences in interpretation were resolved by discussion until consensus was achieved (**Table 7** outlines the example of a code tree).

Table 7. Study phase-wise examples of code trees

Quotation (Example)	Code	Category	Theme
Discovery phase			
We are in the same building, a couple of doors away from each other and […] there are a lot of concerns concerning surgery, some of them are taking … blood thinner, […] What if any emergency happens, it is really rare, regularly they are really safe, but still… maybe patients being allergic to it […], I wouldn't do it in the primary office being alone….the only one responsible for that patient's life. But I do it because I have all this, I talk to them […] so it's all that collaboration with the colleagues. (Dental care provider 2, FGD)	Co-location	Supportive environment	**Developed operational structure supporting integration of oral health**
It was a unique setting that we had at the Cree Health Board, that we didn't have anywhere else, that the clinical services could work hand in hand with the prevention services to have a stronger impact on the population. (Administrator 3, FGD)	Free clinical and preventive dental services		

If there's any referral at the daycare that we send the referral, we send a letter to the parents and we send all the lists to the Secretary and the dentist, saying that this kid needs to be seen. (Dental care provider 1, FGD)	Referral services		
Dream phase			
It's important that the [dental] clinic is in the hospital because of the …. Proximity. Yes, but there are really big problems, health problems like hypertension. And as the dentist, we have a lot of pressure because patients have high blood pressure, …. it's secure us to have a doctor in the room. (Dental care provider 5, FGD)	Co-location as facilitator	Co-location	**Anticipating expansion of oral health promotion and faster access to care**
I think it's starting to be integrated at daycare. It's well implemented at school. We don't see much of it here at the clinic. (Non-dental care provider 1, Interview)	Challenges even after being co-located		
We have the option to go through Cree Health Board, they pay for the flight to go down and boarding home …. But we went on our own and now we submit a claim, and they pay for the basic... so. it's not the problem of the cost…. (Patient 2, Interview)	Free dental services as a facilitator	Financial support	
At Multi-service day centre, we have … the special needs, to teach them or tell them like when they have to brush their teeth, after lunch, or when they have their lunch, each of them has to go to brush their teeth, […] It was part of the program (Non-dental care provider 5, Interview)	Various types of community oral health promotion as facilitators	Oral health promotion	
Awash, so yeah … there is no follow after 5 years old. We don't see the child until … after 5. Just if the child goes to daycare, but if he doesn't.. we don't have any contact with him.. until they go to the school, and they provide the sealant in the school it is at age 6. (Non-dental care provider 6, Interview)	Challenges related to oral health promotion		
I was little surprised about my tooth because I had, all my tooth started to have some problems and I haven't come for at least two-three years and when I came here, he (dentist) told me, we gonna	Facilitators for dental service provision	Dental service provision and quality	

check your teeth and then he took a look and say well we can fix them come back or will call you and then one week after, he called me, I had my appointment, they fixed my teeth and another week after they called me again. I was surprised it took just not even two months to pick all my teeth and there are at least eight or 10 that I thought that they are going to pull them out, I had a very good service at that time. (Patient 3, Interview)			
Regular [Dental] checkups… well, usually it's every 6 months' right… but I think it takes more than that now. (Patient 4, Interview)	Challenges for dental service provision		
[do you have any problems with getting the appointment soon] no, no I think it's really organized here… ya because we have these secretaries that call you to remind you that you have an appointment. (Patient 4, Interview)	Facilitator of appointment scheduling	Appointment scheduling	
Even from the school, they referred my daughter to the dental clinic and we never got a call either. (Patient 5, Interview)	Challenges for appointment scheduling (waitlist)		
Design phase			
Even with the high school, there needs to be more education and… a lot of prevention, education and also with their habits. I've heard of kids starting chew tobacco. Awareness about oral cancers. (Non-dental care provider 7, Interview)	Oral health promotion of children and families	Extending oral health promotion for all age groups	**Expanding promotion of oral health care**
It's good to have a program, for that [home visits including oral health for senior]. Ya, just check-ups and we would do visits at hospitals, I find that too with the patients who are there for the long term, … chronic. (Dental care provider 6, Interview)	Oral health promotion for elders		
[what would be the easiest way to do the follow up to these kinds of person] I don't know, probably.. if the dental team gets a list of the home care clients? because usually, we give our home care list to departments, we'll give it to the archive, to pharmacy, Cree patient services department knows our patient list, so if they	Oral health promotion for Special needs	Extending oral health promotion for Special needs	

have a patient list, maybe they could try to help, get us some appointments with their clients that really need. (Non-dental care provider 8, Interview)			
People who are highly recognized here, people that are looked up to, I think if somehow some of those people pass the message, there are some elders … like the chief, the council, business owners…they are like powerful voice to give their message to them. (Patient 2, Interview)	Community role in oral health promotion	Community innovators	
With CHRs, we can do sessions with parents explaining what happens to the food. I think it's more session you go to daycare or go to school. Maybe parents' night at school. (Non-dental care provider 9, FGD)	Oral health promotion via oral health nights, parents' nights, youth nights, sports events, festivals, etc.	Additional community oral health promotion ideas	
There's also .. the local newsletter, they can always put out something there. It's local every month, the newsletter. I think they can put dental stuff there …. at least for April dental health month or.. maybe for Halloween also, the kids have lots of candies.. they can explain what candy can do to your teeth. (Dental care provider 7, Interview)	Audio-visuals aids in oral health promotion such as pamphlets, posters, flyers, radio, local newsletters.	Community oral health promotion tools	
The level of care could be better with telemedicine? with a radiologist looking at the x-ray from—it is possible to implement such a thing here once we have our new clinic. (Administrator 7, Interview)	Tele-health for dental services	Provision of E-oral health services	

To establish trustworthiness, member checking using synthesized data was done. During member checking, preliminary results were provided to stakeholders, and they were asked to suggest any change or additional information. Other strategies to enhance trustworthiness included the triangulation of multiple data collection methods and data sources as well as investigators triangulation.

Patient and public involvement

Cree community members participated during the planning phase of the project. Patients were involved in the recruitment and conduct of the study. The research results have been shared with the CHBSSJB organization to facilitate integrated care in oral health services at this organization.

4.2.4 Results

The total number of key participants in Discovery phase was 27 and in Dream phases was 44 (**Table 8**). In total, six group discussions and 36 interviews were conducted, and ten major themes emerged in the Discovery and Dream phases. For confidentiality purposes, all quotations have been rendered in English.

Discovery phase

In this phase, from four FGD and three interviews, five themes were identified as strengths of the organization in integrating oral health care.

Theme 1. Cree illustration of the integration

The concept of integration is embedded in the Cree culture, which promotes working and moving forward interdependently. Working together helped them to claim their rights and sign their land claim agreement 'the *James Bay and Northern Quebec Agreement*'. Consequently, from a vision of integration, the CBHSSJB developed its first strategic regional plan in 2004 as a tool for integrating health and social services in the Cree communities.

> *The concept of working together or integrated services is not new to Cree people; we are people who are very interdependent. We believe that in order to move forward, we need each other. And the signing of 'the James Bay Northern Quebec agreement' is one big example of when we achieved working together.* (Administrator 1, FGD)

Theme 2. Organization committed to a clear vision

All the stakeholders appreciated the development of an integrated care delivery model in the CBHSSJB organization's strategic plans including the integration of oral health. They also valued organizations' continuous efforts in working towards achieving their planned goals and objectives mentioned in their strategic plans.

We're going to make a structure that will be facilitating to bring in the integrated services that have been the vision since 2004-2014. Then, we are working on the Strategic Plan, then we will look at the objectives that are expected, [….] we are working with epidemiology and statistics. (Administrator 2, FGD)

The CBHSSJB organization works for integrating oral health by facilitating interprofessional teamwork and oral health promotion during health promotion activities.

There is a connection with dental for a couple of years; […] people see that oral health is within health in general, … we had a presentation with diabetes, we have links with the physicians that send us patients ..., we work with the Community Health Representatives (CHR) .... It is the same principle with the school and the daycare ... it's part of our goals to integrate within the health field ... but if you look in the south, it's rare for a dental clinic to be inside the hospital. (Dental health care provider 1, FGD)

Theme 3. Engaged professionals within an effective organizational structure

Another strength of the CBHSSJB is its multilevel organizational structure under the strong leadership of the board of directors and executive directors. It creates a sound work environment for the professionals to be fully engaged within their roles and responsibilities.

We have the chief of department fully engaging in the administrative duty of the department of the nine clinics, which is very unique. Because of that, we have built up a very good structure. We are close-knit families in between the communities. We often have meetings with the dentists, dental hygienists. (Administrator 3, FGD)

Participants reported that the CBHSSJB has multiple incessant challenges because of the higher prevalence of health problems as well as associated health needs in the communities. Nevertheless, participants praised the organization's efforts to provide services adapted to the population's local needs.

Local directors in each community… to get a little more local control in adapting the needs of the local communities […], but how do we work is all together and the patients feel that everything flows well for them. (Administrator 2, FGD)

Theme 4. Operational structure that supports integration of oral health

The CBHSSJB has developed an infrastructure facilitating the co-location of the dental clinic with other primary care services. The organization also provides a supportive environment by providing free basic and referral oral health care services.

> *It's all the relationship, we are in the same building, and we are workers. Now, it's comfortable, we are talking about the nurses, the physicians, for sure physicians could help … to deal together with them.* (Dental care provider 2, FGD)

Theme 5. Significance of Cree language in health care provision

The importance of the Cree language in the provision of health and oral health care was one of the strengths of integrated care delivery at CBHSSJB. The use of Cree language in service delivery promotes Cree traditions and customs. However, translating from English to the Cree language is sometimes difficult due to the unavailability of some scientific terms in the Cree language. Henceforth, this theme pointed out developing and translating the Cree dental terms based on the definition and explanation of the scientific terms.

> *'Minapidesuu' (the one who pulls teeth out), that's the name of dentist …. So, the fear factor and trauma come back in that word …. So, in order to have the activity of oral dental health care, people take personal responsibility, they won't because of that fear factor in that trauma [...]. I asked better word for oral health care with the CHR for translating for the unilingual speaking or even to children with mothers, they say 'Minapideo' ('to have better-looking teeth'), I say the term 'Minapideo' would be a better term for good oral healthcare.* (Administrator 4, FGD)

Environmental scan

Our results from the documentation review identified five categories of documents from a total of 232 documents, including planning documents, health outcome reports, administrative documents, procedural documents and educational tools. **Table 9** outlines environmental scan data on common primary oral health care services in Cree communities. These services include services at CMC, Â Mâshkûpimâtsît Awash (AMA), Elementary school-based programs and Daycare and homecare programs provided by various dental and non-dental primary health care providers. **Table 10** provides the contextual description of the four cases and **Table 11** compares elements of integrated primary oral health care across all four cases.

From the environmental scan, we identified 3 strengths of the CBHSSJB organization that support the integration of primary oral health care: 1) provision of dental services proportional to the communities' population; 2) development of strategies for incorporating oral health into service delivery within CMCs and public health programs; and 3) guidelines for multidisciplinary team working. We also identified the co-location of the dental clinic, the referral system for public programs and specialized services, and the shared medical record system as facilitators for coordination among care providers. However, some challenges existed in regard to the ill-defined role of general practitioners, the non-optimal referral procedure and follow-ups within health centres, and the need for more standardized protocols and guidelines.

Dream phase

A total of two FGD and 33 individual interviews were conducted during this phase and five themes emerged from our analysis.

Theme 1. Anticipating the expansion of oral health promotion and faster access to care

Participants shared stories about their satisfaction with the quality of dental services at the clinic. This theme also confirmed findings from the previous phase in terms of the recognition participants gave to the co-location of the dental clinics, the provision of free dental services as well as the oral health promotion programs.

> *[happy with the services for oral health?] Yes! I think there are more services here than down south.* (Non-dental care provider 1, Interview)

Most participants mentioned the challenge of booking dental appointments due to the long waitlists. Therefore, they dreamed of promoting immediate appointment scheduling especially in cases of urgent needs. Furthermore, they wished extended oral health promotion programs especially for the elderly and people with special needs.

> *I think there should be an improvement … even for special needs …, they should do at least visits because some of them are at home either & they can't come directly here.* (Non-dental care provider 2, Interview)

Theme 2. Ameliorating human resource management

Participants praised the CBHSSJB in appointing Cree health care workers and permanent health professionals. Appointing Cree employees reflects a cultural-appropriate way to render health services. However, they still dreamed of having more Cree and permanent employees for compensating problems associated with long waitlists for the appointment.

> *Cree employees make a difference. […] When you have someone that speaks in Cree to you, you tend to listen more, you tend to ask more questions.* (Administrator 5, Interview)
>
> *I wish we had more dentists so they can have regular check-ups …. I think one dentist is not enough.* (Patient 1, Interview)

Theme 3. Envisioning enhanced care coordination and navigation

They recognized strong team working and effective coordination among professionals as the strength of this organization. It creates a pleasant environment not only for care professionals but also for patients. Moreover, shared physical medical and dental records facilitate care coordination and referral services.

> *The key success of your clinic is the interaction between everybody when it works well. Here it does. […] First of all, it's much more pleasant for me because it's a good environment to work in, but it's good for the patient as well, he can feel that things are going well, that it's pleasant.* (Dental health care provider 3, Interview)

These participants hoped to strengthen the care coordination especially for chronically ill medical patients by developing more accessible protocols and guidelines for appointment scheduling and interdepartmental referral. They also desired digitalizing health records for quick access to health information and streamlined health data.

> *It takes a long time before the report comes in, so … by digital, It's faster.* (Non-dental care provider 1, Interview)

Theme 4. Organization working towards continuous improvement

Participants praised CBHSSJH's continuous efforts to develop advanced technology and infrastructure, providing logistical support and conducting regular meetings and evaluations.

> *For the administration part, we have everything … like we have more than enough … material, … equipment, I'm happy with what I have.* (Dental care provider 4, Interview)

Some communities have excellent infrastructure, while others are very crowded. They dreamed of new bigger infrastructure in the communities where this was not available.

> *We need the space; we need a new hospital. We have 3-4 chairs, actually at the moment. We have some period of time when specialist doctors come to the dental clinic. They use the same room as the dental hygienist. We need the dental hygienist that week to not provide her services. So, it's a question of space.* (Administrator 6, FGD)

Theme 5. Focus on integrating culture into oral health care

Participants appreciated the integration of traditional practices into health services by creating a specific department (Nishiiyuu Miyupimaatisiiun Department) that works on integrating traditional knowledge and culture for their health and well-being. They also valued the role of Cree traditional healing in health and oral health problems.

> *We have the cultural department now in the community … it's only been up a couple of years now. We even have a book on traditional medicine. […] I know one specific medicine, [….] that's been used before, … how is tooth pain taken care of? […] The only way I knew was feces. Feces wrapped in a cloth and put it in your tooth; then you had to bite on it. And I saw it too! it worked on my sister! […] I know they talked about using fire ashes to brush your teeth.* (Administrator 7, interview)

They praised non-Cree health professionals' interest in learning culture with their own experiences working in Eeyou Istchee. Non-Cree employees even pointed out more relevance of immersing in the Cree culture than getting trained on the culture. These non-Cree employees while dealing with Cree clients, emphasized learning Cree history and sharing their experiences with the elders in the communities to better understand their clients.

> *(If) you understand the culture, easier your work is. At the beginning, it was so hard because we take all our knowledge from the south … and we try to apply them here, and […], it doesn't help. Experience, you have to come, and … because those things cannot be taught, you need to live with people to realize.* (Dental care provider 4, interview)

> *The non-judgment of the patient is that we will learn to have more openness to cultural differences…; then it's sure that after listening, you have to know the history of the Cree […] You have to know what they lived. […] Then there are times when I do not understand what's going on with the client, … I go to sit down with social services, and then I say there's something I do not understand, is that*

what Can you explain to me? Then they will not give you the answer right now, they will give you a big history before. Then, there are lots of times I've been stuck, and then I go to … the elder in social services, I need help there, I'm stuck, you explain to me and in general, I'll have feedback, okay, that's why this person is like that because culturally you do not say it, it's unsaid, but that's what happened. (Non-dental care provider 3, Interview)

However, they wished to raise community awareness about traditional medicines and to integrate cultural oral health practices by learning about traditional healing from elders. This will not only help in keeping their traditional Cree healing alive but also will be beneficial in achieving holistic health.

Some of our elders … can help fix the toothache or can fix health, a lot of stuff with traditional medicine, AMAZING! … Respect what we know because it's something that's really amazing … [we need] to integrate all the knowledge … from the elders. (Non-dental care provider 4, Interview)

People need to be shown … how to work with the [traditional] medicines and … educating them would be a vital thing for the community … that's what I think needs to be done. (Administrator 7, Interview)

Design phase

Recommendations for an action plan were discussed and validated with key collaborators and were presented to administrators and health care providers. These recommendations were divided into the following categories: increasing promotive and preventive services, faster access to dental services, improving management, better coordination, and promoting cultural integration (**Table 12**).

4.2.5 Discussion

To our knowledge, this is the first study that uses AI in the field of Indigenous oral health research. The use of AI in evaluation allows for better recognition of Indigenous culture and values in organizational health services. Our results suggest that the CBHSSJB has developed a grassroots innovation in integrating primary oral health care. Commencing with the identification of oral health needs in the communities, this organization is progressively working on the regular development of policies for organizational governance, management and the coordination of services.

The recommendations derived from the results can help to optimize the integrated primary oral health care services in the CBHSSJB organization. Also, these recommendations will help in providing new scientific evidence on the integration of oral health into primary care, which could be instrumental in improving the quality of oral health care.

Facilitators of integrated oral health care are similar to those identified in previous studies, such as interprofessional collaboration, geographical proximity, shared health records, supportive operational policies, and native health workers [35, 36]. Similarly, barriers in this regard were also in line with what has been identified in previous literature; for example, lack of exclusive bi-directional interprofessional education, lack of human resources and staff turnover [35].

In general, there are few integrated health programs such as Medicaid, Affordable Care Act, CareMore health systems that offer dental coverage; most of them have very limited or only emergency based dental coverage especially for vulnerable populations [37, 38]. Several organizations and associations including Neighborcare, Dorchester House Multi-Service Center, Kaiser Permanente, Marshfield Clinic, Boston Medical Center have used novel ideas to integrate oral health care into primary care, such as co-location, cross-referral process, cross-training on oral health screening for physicians, oral health care screening in schools, interprofessional collaboration, shared electronic health records, case management and performance measurement [36-40]. The CBHSSJB is actually addressing most of the recommendations for developing an integrated primary oral health care approach from available evidence of various organizations [7, 39]. For instance, it established a population-based health management approach, shared health records, assured geographical proximity, had dental coverage, interprofessional collaboration and referral [39].

The themes derived from this study coincide with all the dimensions of integrated care as per the Rainbow model and the five foundations of integrated care model. As reported by Leutz, the degree of integrated primary oral health care at the CBHSSJB corresponds to the coordination and linkage rather than full integration [41]. Based on the extent of integration of dental care described by Atchison et al., the CBHSSJB represents an example of *co-location and closer integration of medical and dental providers* [36].

The selection of four cases represents a reasonable number to achieve diversity among the key variables as well as the transferability of our findings. The diverse roles and responsibilities of the study participants support the applicability of these findings among the stakeholders of different healthcare organizations. However, this study might have encountered bias due to various types of study participants such as administrators, health care providers and patients. Nevertheless, a large sample size would have outweighed such biases by ensuring representativeness from all participants' range. Being qualitative in nature, this study does not support the generalizability of its findings; however, our study findings contribute to integrated primary oral health care research and can be applicable to other similar settings.

4.2.6 Conclusion

This study results suggest that the CBHSSJB has developed a grassroots innovation in integrating primary oral health care. This organization has been successful in implementing strategic planning on oral health integration into primary care at all levels of integration, nonetheless, the organization needs further strengthening for full integration.

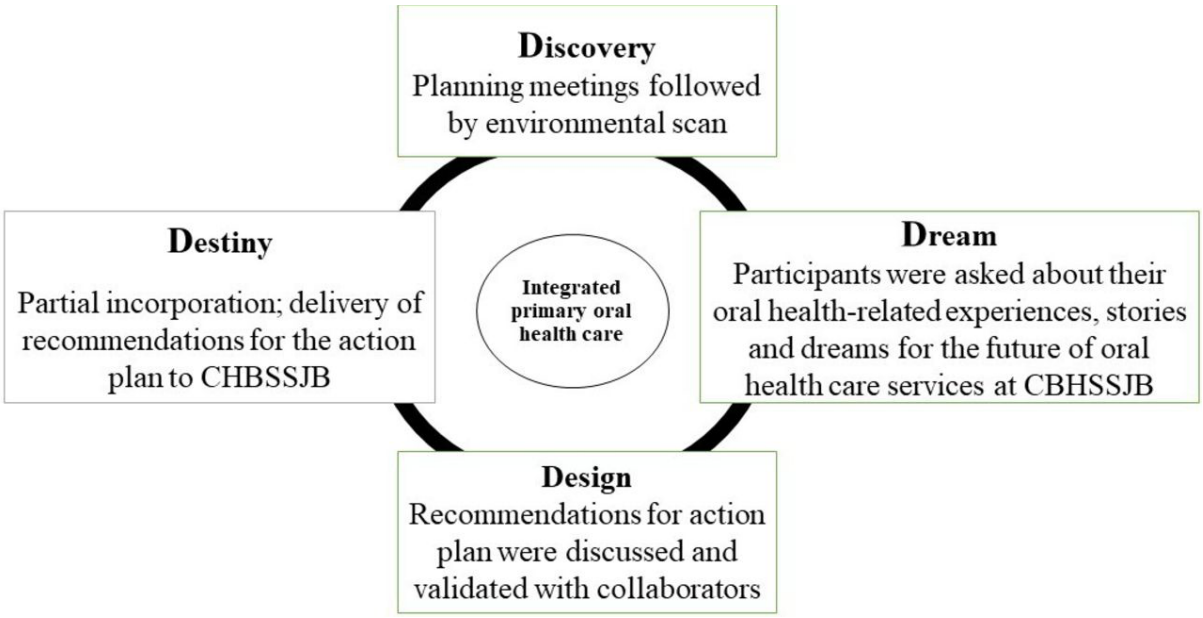

Figure 10. Study phases as per AI's 4 D model

Table 8. Total number key informants in discovery phase and dream phase

Phases		Number of key informants
Discovery phase	**Participants in Planning meetings**	27
Dream phase	**Community 1**	7
	Community 2	20
	Community 3	9
	Community 4	8

Table 9. Common primary oral health care services in Cree communities

Service center/ program	**Community Miyupimaatisiiun Center (CMC)**	**Â Mâshkûpimâtsît Awash (AMA)**	**Elementary school-based programs**	**Daycare and homecare programs**
Care Providers	• Dentist • Dental hygienist • Clinical nurse • Dental specialist upon referral	• Doctor • Clinical nurse • CHR	• Nutritionist • Dental hygienist • School nurse • CHR • Dentist upon referral	• Nutritionist • Dental hygienist • Home care nurse • CHR
Target group(s)	All ages	Pregnant women Children (0-9 years)	All students	• Children (0-4 years) • Elderly (30 years +)
Activities and/or services	Oral health promotion Preventive dentistry Restorative dentistry	Oral health promotion	Oral health promotion Preventive dentistry	Oral health promotion Preventive dentistry

Table 10. Contextual description of four cases

Cases	Community 1	Community 2	Community 3	Community 4
Population	4,033	5,190	2,558	855
Geographical characteristics	• Inland • Southern	• Coastal • Northern • Relocated	• Coastal • Southern	• Inland • Southern • Relocated
Cultural characteristics	• Traditionally live on hunting, trapping and fishing • Home of Largest Fresh Water Lake in Quebec, strong attachment to the lands	• Traditionally live on hunting, trapping and fishing • Biggest Cree community located on the shore of a river	• Traditionally live on hunting, trapping and fishing • Oldest Cree community in the James Bay and an important historical site	• Traditionally live on hunting, trapping and fishing • Maintain a harmonious relationship in and around a lake which has plenty of fish
Health and oral health care services	CMC, dental clinic within CMC	Regional hospital and CMC, Dental clinic within regional hospital	CMC, dental clinic within CMC	CMC, dental clinic within CMC
Dental Clinic Characteristics				
Clinic environment	Renovated	Not renovated	Not renovated	Renovated
Total number of hygiene and operating rooms	8	4	2	3
Number of dentists	3	2	1	1
Number of dental hygienists	2	2	1	1
Number of dental assistants	3	3	1	1
Number of dental secretaries	2	2	1	1
Number of Dental consultation (2018-19)	3,745	2,320	1,623	359

Table 11. Elements of integrated primary oral health care across all four cases

Elements of integration of oral health into primary health care	Community 1	Community 2	Community 3	Community 4
Co-location	✓	✓	✓	✓
Free dental services	✓	✓	✓	✓
Community-based oral health promotive and preventive services	✓	✓	✓	✓
Specialized services by visiting specialist	✓	✓	Referred to Mistissini or Chisasibi via CHBSSJB	Referred to Mistissini or Chisasibi via CHBSSJB
Referral services outside the territory	-Covered for Cree beneficiaries - Patients can go via Wiichihiituwin (Cree Patient services) department to Montreal, Val d'Or or Chibougamau	-Covered for Cree beneficiaries - Patients can go via Wiichihiituwin department to Montreal, Val d'Or or Chibougamau	-Covered for Cree beneficiaries - Patients can go via Wiichihiituwin department to Montreal, Val d'Or or Chibougamau	-Covered for Cree beneficiaries - Patients can go via Wiichihiituwin department to Montreal, Val d'Or or Chibougamau
Employment and training of Local health workers (Dental assistants, Dental secretaries and Community health workers)	All dental assistants, receptionists and community health workers are native and trained	All dental assistants, receptionists and community health workers are native and trained	All dental assistants, receptionists and community health workers are native and trained	All dental assistants, receptionists and community health workers are native and trained
Interprofessional coordination	✓	✓	✓	✓
Collaboration with other local organizations such as Cree School Board, Youth Council, Multi-service Day Care Center	✓	✓	✓	✓
Evaluation and quality improvement	✓	✓	✓	✓
Non-dental Staff training on oral health	✗	✗	✗	✗
Shared physical health records	✓	✓	✓	✓
Culturally competence training	Done for nurses, but not for other health providers	Done for nurses, but not for other health providers	Done for nurses, but not for other health providers	Done for nurses, but not for other health providers

Table 12. Recommendations developed and validated in design phase

1.	**Expanding promotion of oral health care** ▪ Extending oral health promotion and prevention to all age groups ▪ ***For children and families:*** Involvement of social workers and community workers in oral health promotion for families; involving young parents in oral health promotion; full-time dental hygienist or at least more frequent dental hygienist rotation for AWASH, to introduce oral health promotion into school curriculum ▪ ***For Elders and people with special needs:*** Integration of home-based oral health care; expanding oral health promotion and prevention at Multi-Service Day Centers ▪ Recognizing and engaging *'community innovators'* such as elders, youths, local community leaders for oral health promotion ▪ Facilitating oral health prevention and promotion in public health programs and community activities such as oral health nights, parents' nights, sports events, festivals, cultural activities; provision of dental weeks or dental day; raising competitive behaviour by organizing competitions like *'beautiful teeth'* ▪ Promotion via audio-visual aids and information technologies such as pamphlets, flyers and posters, radio, local monthly newsletter, social media websites, creating promotion videos (in Cree language especially for elders), conducting workshops and presentations ▪ Provision of mobile dental vans for promotion and services for people with limited accessibility ▪ Provision of Tele-oral health services by engaging native care providers
2.	**Facilitating access to care** ▪ Regular dental check-up especially for people at risk such as those with chronic illnesses ▪ Extending hours of work such as weekend clinics, evening clinics to assure better services for working adults and younger population ▪ Emergency walk-in at dental clinic during weekends and holidays ▪ Provision of more frequent specialized services in all the communities
3.	**Augmenting organizational management** ▪ Reinforcement of recruitment of additional and permanent oral healthcare providers by offering financial and non-financial benefits ▪ Custom training of local/ Indigenous people to become professional health care providers

	▪ Regular training, continuing education and workshops for dental primary care providers including dental assistants, secretaries, CHRs ▪ Infrastructural developments
4.	**Strengthening care -coordination** ▪ Development of uniform protocol for appointment scheduling ▪ Strengthening protocols for better care coordination ▪ Developing a case management system by appointing case manager for every patient ▪ Oral health care training for non-dental primary care providers such as dental triage training ▪ Expanding the digitalization of health records
5.	**Promoting cultural integration** ▪ Proposing a new job position of 'Dental community health representatives' ▪ Engaging the Cree communities and elders to collaborate in the development of a Cree language dental glossary to help improve communication ▪ Researching and adopting traditional practices related to oral health as well as acknowledging elders' experiences ▪ Development of specific cultural competency training for non-Indigenous health care professionals ▪ Educating community people on the role of traditional medicine ▪ Having Sign Boards at CMC in the Cree language particularly for elders

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4.3 Article 3

Patients' perspectives on integrated oral healthcare in a northern Quebec Indigenous primary health care organisation: a qualitative study

Authors: Richa Shrivastava[1], Yves Couturier[2], Naomi Kadoch[1], Felix Girard[1], Christophe Bedos[3], Mary Ellen Macdonald[3], Jill Torrie[4], Elham Emami[3]

[1]Faculty of Dentistry, Université de Montréal, Montréal, Québec, Canada.

[2]School of Social Work, Université de Sherbrooke, Sherbrooke, Québec, Canada.

[3]Faculty of Dentistry, McGill University, Montreal, Québec, Canada.

[4]Public-Health Department, Cree Board of Health and Social Services of James Bay, Mistissini, Québec, Canada.

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4.3.1 Abstract

Objective: Patient-centered care is considered to be an important element in the evaluation of integrated health care and has been effective in addressing oral health disparities. This study explored the patients' perspectives of patient-centered integrated care in oral health services integrated into a primary health care organization serving a northern Quebec Cree population.

Methods: This study used a multiple case study design within a qualitative approach and developmental evaluation methodology. This study was conducted in purposefully selected four Cree communities of Northern Quebec. Participants were the adult patients in need of oral health care and who attended the local dental clinic identified and recruited by maximum variation sampling and snowball techniques. Two theoretical models, Picker's Principles of Patient-Centered Care and Valentijn's Rainbow Model of Integrated Care, guided data collection and data analysis. The thematic analysis included transcription, debriefing, codification, data display, and interpretation.

Results: Data analysis generated six major themes: enhanced accessibility, empowering supportive environment, building trust through shared decision making, appreciation of public health programs, raising oral health awareness, and growing culturally competent health care providers. Patients identified the integration of dental care into primary health care with respect to colocation, provision of free oral health care services, care coordination and continuity of care, referral services, developing supportive environment, shared decision making, oral health promotion, and culturally competent care.

Conclusions: These results confirmed that patient-centered care is an important element of integrated care. Patients valued the use of this concept in all domains and levels of integration. They recommended to further strengthen the clinical integration by involving parents in oral health promotion as well as optimizing care coordination and empowering a supportive environment in organizational integration.

Strengths and limitations of this study

1. To our knowledge, this study is the first worldwide research that explored the patients' perspective in regard to the integration of oral health care in an Indigenous primary health care organization.

2. In-depth individual interviews allowed a rich exploration of patients' perspectives on patient-centered integrated oral health care in this organization.

3. Results suggest that patient-centered care is an important element of integrated care and it can be facilitated by the factors such as colocation, provision of free dental services, oral health promotion, referral services, care coordination, supportive environment, shared decision making, and culturally competent services.

4. Results are based on small sample size of patients recruited from Cree community hospitals.

Keywords: 5 (Patient-centered care, Integrated health care systems, Primary health care, Oral health, Indigenous health services)

4.3.2 Introduction

Throughout the late 20th century, influential works such as Engel's biopsychosocial model and Balint's Patient-Centered Medicine in North America and Europe have inspired the shift of health care service delivery towards a holistic patient-oriented approach [1-3]. During the late 1980s, patient-centered care was conceptualized and defined by the Institute of Medicine as: "providing care that is respectful of, and responsive to, individual patient preferences, needs and values, and ensuring that patient values guide all clinical decisions" [4]. Patient-centered care applies to all levels of health care organizations irrespective of population and ethnic or cultural groups [3, 5]. Research has demonstrated that implementing patient-centered care in health care organizations can reduce health care costs and improve health care quality and outcomes, patient adherence, patient satisfaction, and care provider satisfaction, and has the potential to alleviate health care disparities [3, 6-9].

The World Health Organization (WHO) has also developed a global strategy for programs that involve patient-centered care in integrated care to deal with the barriers encountered by current health systems such as demographic transition, highly prevalent chronic diseases, and subsequent economic burden [8]. As defined by the WHO, integrated care is "bringing together inputs, delivery, management and organization of services related to diagnosis, treatment, care, rehabilitation and health promotion" [10].

Several health care associations and organizations including the Canadian Nurses Association, Canadian Medical Association, and Health Action Lobby have identified patient-centered care as one of the five foundations for integrated care, along with access, relational continuity, management continuity, and information continuity [8, 11, 12]. Moreover, ascribing a significant role to patient-centered care in oral health care, several oral health care organizations in Europe, Australia, and North America have introduced patient-centered care as a core element in the evaluation of integrated health care services [3, 4, 13-15]. The patient-centered care model of integration of oral health care within primary health has been highlighted to be effective in addressing oral health disparities among Indigenous communities [16, 17]. Moreover, the role of patient-centered care becomes imperative in the case of Indigenous populations considering historical

trauma due to colonization and assimilation policies [18]. These historical traumas included loss of homeland, loss of family for children in residential schools, loss of traditional cultural practices as well as mistrust, distress, and fear towards the intentions of non-Indigenous people [19, 20]. Hence, consideration of Indigenous patients' cultural values, beliefs, and preferences, as well as their holistic vision of health, is essential in the implementation of patient-centered care in Indigenous populations [18].

According to the recent WHO report there is still lack of evidence focusing on the application of people-centered integrated care in primary health care settings [8]. Furthermore, as highlighted in a systematic review by Mills et al. in 2014, there is still a gap in regard to the application of patient-centered care concepts from patients' perspectives and in oral health research [3]. Also, Harnagea et al. emphasized in a recent scoping review the lack of evidence on the outcomes of integrated primary oral health care programs among disadvantaged populations [21]. Therefore, the objective of this study was to explore patients' perspectives and experiences in regard to patient-centered integrated oral health care in a primary health care organization serving a northern Quebec Cree population.

4.3.3 Methods

Study Design

This collaborative study was part of a larger Canadian Institutes of Health Research–funded project entitled "Oral Health Integrated into Primary Care: Participatory Evaluation of Implementation and Performance in Quebec Cree Communities" [22]. We adopted a multiple case study design within a qualitative approach and developmental evaluation methodology [23, 24]. The case study design allows an in-depth understanding of a single or small number of 'cases' in their real-world context" [24].

Developmental evaluation addresses the need of the key stakeholders by building a partnership between them and researchers in the assessment of emerging initiatives in their organization [23]. Accordingly, the project started with a planning phase which included a 3-days stay in one of the Cree communities (Mistissini), followed by a 2-days video conferencing workshop few

months later (Mistissini and Montreal) [25]. The details of the workshop have been published previously [25]. In the planning phase, the research team conducted several oral presentations and had several focus group discussions and individual face-to-face meetings with Cree community health centers' administrators, community workers, health care providers, and patients. During these various communications, different aspects of the study, such as research objectives, data collection, recruitment strategies, as well as conceptual frameworks were discussed.

Ethics approval for this study was obtained from the Institutional Review Board of the Université de Montréal and permission from the Research Committee of the Cree Board of Health and Social Services of James Bay. Oral and written consent was obtained from all study participants. We followed the ethical guidelines of Ownership, Control, Access and Possession (OCAP™) for First Nations [26]. This manuscript has been prepared according to the Standards for reporting qualitative research [27].

Study setting, participants, and data collection

Over 18,000 Cree people of Eeyou Istchee inhabit nine remote communities in the eastern James Bay region of northern Quebec, Canada [28]. The health and social services of these communities are provided by the Cree Board of Health and Social Services of James Bay (CBHSSJB) [15]. This organization developed two Strategic Regional Plans, 2004–2014 and 2016–2021, which mandate a model for the integrated delivery of health and social services in the Cree communities including oral health care [15, 29]. Each community has a Community Miyupimatiisiuun (wellness) Centre (CMC) that provides health care and social services through a team of primary health care providers, including para-professional community health representatives [28]. Each community has a well-equipped local dental clinic where free services are provided by dentists and dental hygienists [28].

This study was conducted in four Cree communities that were purposefully selected based on population size as well as on geographical, cultural, health care, and oral care characteristics. We used maximum variation sampling and snowball techniques to identify and recruit adult patients (≥18 years) in need of oral health care and who attended the local dental clinic in 2016–2017. In-depth audio-recorded interviews, on average 60 minutes long, were conducted in English or

French by two research team members trained in qualitative methods. These team members had no existing relationship with the participants. We designed the semi-structured interview guide based on the Rainbow Model of Integrated Care [30, 31]. Data collection and analysis were performed concurrently until data saturation was reached [32, 33]. Data saturation was reached after the 11th interview; nevertheless, data collection was continued up to 14th interview to ensure the saturation level.

Data analysis

Data analysis included transcription, debriefing, codification, data display, thematic content analysis, and triangulation [32]. We used the eight Picker Principles of patient-centered care and Valentijn's Rainbow Model of Integrated Care as conceptual models to guide exploring and determining the scope of elements of patient-centered care within the integrated care network [30, 31, 34]. Picker's principles comprise: respect for patient's preferences, information and education, access to care, emotional support, involvement of family and friends, continuity and transition, physical comfort, and coordination of care [34]. The domains of the Rainbow Model of Integrated Care are characterized by three categories: scope, types, and enablers of integration. Scope comprises person- and population-based care; types include system, organizational, professional, and clinical integration; and enablers include functional and normative integration [30, 31]. We performed a combination of deductive and inductive thematic content analysis using ATLAS.TI software (ATLAS.ti, version 1.6.0, GmbH; Berlin, Germany) [35]. The deductive approach encompassed the creation of provisional categories derived a priori from the conceptual models. This was embedded with an inductive approach, which consisted of adapting these provisional categories into new categories and themes based on the content of the transcripts [32, 35]. Two research trainees (RS, NK) independently performed the analysis and then discussed the emerging codes in detail until they achieved a consensus on emergent categories and themes. The thematic analysis was then revised by other research team members (EE, YC, FG, CB, JT, MM). The results of the study were discussed and cross validated with community stakeholders.

Patient and Public Involvement

Patients have been actively engaged and accepted to participate in the study. The study results will be shared with the community members via CHBSSJB.

4.3.4 Results

Table 13 presents the demographic profile of the 14 participants. Among them, four were working as health care providers who attended the dental clinic as patients for their treatments. The following six themes were generated from our thematic analysis.

1. Enhanced accessibility: Participants highlighted the impact of the integration of oral health into primary health care in facilitating the access to oral health care in terms of the easily accessible location of the dental clinic as well as its proximity within the CMC. Most of the patients perceived colocation as expedient, especially in case of complications and emergencies.

> *I love how it's [location of the clinic] two in one, like almost ... I know elsewhere it's completely separate.* (Participant 3)
>
> *I think it would be better to be close just in case sometimes complications do happen, you know it's low chance, but it does happen so. (Participant 4)*

They also valued the provision of free oral health care services within integrated health care.

> *[dental services are covered] It makes a difference ... I take advantage of it ... I know it's there ... that's why I always come. (*Participant 11)
>
> *[fact that the treatments are free] It's the best thing ever! I love it!* (Participant 3)

Participants also appreciated referral mechanisms of integrated care at the CBHSSJB organization. These referral mechanisms facilitated provision of specialized dental treatments by the linkage of primary health care to secondary or tertiary levels of health care.

> *I love how [the orthodontic service] has weekend visits so we don't have to miss work, most of the time I bring my kids.* (Participant 3)

Patients acknowledged the need for better care coordination to tackle the long waitlists and to enable follow-ups. They also linked the problem of long waitlists with the limited number and

non-permanency of dental care providers. Nonetheless, they valued the competencies of dental care providers in providing quality dental treatments.

> *My son came once then they never called back ... I did the fill-up sheet ... they contacted me 3 months later... and it was like a pain no. 5 .... and the time when we got here, they had to pull out his tooth* (Participant 13)
>
> *The waiting lists and I don't think they are being called! I saw that on Facebook that people complain that …. they made appointments for them because they were in pain and there is still no call.* (Participant 1)
>
> *I think … we would ... just need another dentist. Because that's what keeps the long list.* (Participant 6)

2. Creating supportive environment: Patients expressed the importance of enabling the care, especially for those with dental fear and anxiety, by creating a supportive environment at the clinic. They preferred the dental clinic environment and oral health care team to be more welcoming and empathetic, which in turn can provide psychological support for them.

> *Yeah, the approach, the environment. You know the… positivity in the room. And here like I said they walk in and they're terrified. They won't even open their mouth.* (Participant 4)
>
> *It needs to be behavior: "Hi, how are you? When was the last time you saw the dentist?" … To be more humane, more sympathetic. It will be very nice for someone to come ... instead of filling the form, to talk with the receptionist and to leave with an appointment … that's ideal.* (Participant 13)

3. Building trust through shared decision making: Participants highlighted the importance of including patients in integrated care by engaging them in shared treatment decision making. Most of the patients recognized the value of information given by oral health care providers on treatment options and respecting their choices and preferences.

> *To be engaged in the treatments, some do and some don't. I had a bad experience with my one dentist … The other one saying, "Ok if that's the way you want it." Then they'll just tell us, "This is what's gonna happen if you do it this way."* (Participant 4)

Furthermore, participants expressed that shared decision-making reinforced building trust with the health care providers and improved the quality of care.

> *I think empowering the person to take part in the process, is not a bad thing. It actually establishes more of a relation—trust.* (Participant 5)

4. Appreciation of public health programs: Participants appreciated the continuity of care via CBHSSJB public health programs, which linked promotive and preventive oral health care to primary health care. These public programs included daycare- and school-based oral health programs for children and Â Mashkûpimâtsît Awash program for pregnant mother and childcare where promotive and preventive dental services were offered by dental and non-dental care providers.

> *My grandson is in kindergarten now … They [dental care providers] do some kinds of things at the school … They just teach him how to brush, they take the big teeth model and they teach them to use the brush … and they give them little toothbrushes in packages. (Participant 7)*

5. *Raising oral health awareness*: Patients discussed lack of oral health awareness among the community residents. They expressed the need to promote oral health and increase oral health literacy via creating awareness programs and engaging parents in oral health education.

> *I think, for me … I learned how to take care of my teeth at home with my parents. (Participant 9)*

> *The parents … should be, I think it's maybe the number one spot. [Some of the parents should be educated more?] Yes. Cause I know some parents have dropped out of school very early and they didn't go through a lot of what indicate a parent when it's, like I said … the dentist visits the schools… and a lot of parents don't have that. (Participant 4)*

Patients proposed novel ideas for awareness campaigns via radio, television, social media, and short videos and also during social events such as health nights (youth awareness event), youth festivals, and sports events.

Videos, short videos like showing someone brushing their teeth like two seconds of that ... flossing and then a really nice smile .... different products that could be used, just like … two-minute video … the beginning of the video to make it like that interesting … it can go on there ... they can share it. (Participant 13)

Here it's sports, hockey—to advertise … It would be very helpful. People might not listen, but you know it gets in their heads. (Participant 4)

6. Growing cultural humility among health care providers: Participants appreciated having Indigenous people among dental teams and hearing Indigenous language during provision of care. Patients also highly valued non-Cree health professionals' interest in learning their culture, traditions, and language by attending cultural activities and traditional ceremonies that helped them in developing affinity and building trust with the community. They also praised non-Indigenous care providers' attempts to learn and speak Indigenous language to make them feel comfortable during treatment.

I like that [dental care providers] like to learn. Like they go with the family when they go in the bush or whenever, to learn. Or to the gravel pit … There's lots of things you can learn over there. They're always doing stuff … (Participant 8)

Even the dentists. They tried the Cree [Cree word] "keep your mouth opened" and they're amazing! (Participant 3)

4.3.5 Discussion

It has been two decades since the concept of patient-centered care was first introduced to integrated care [36]. Shaw et al. identify patient-centered care as a crux of integrated care and recommend including the patient's perspective as an organizing principle of service delivery [36]. To our knowledge, this study is the first worldwide research that explored the patients' perspective in regard to the integration of oral health care in an Indigenous primary health care organization.

Study findings demonstrate that these patients valued the integration of oral health care in primary health care in regard to colocation, free oral health care services, coordination, and continuity of care. They highlighted the importance of respecting their perspectives in clinical decision making, integrating Indigenous personnel in dental teams, optimizing care coordination, providing a supportive environment, and oral health promotion. The emphasis on culturally sensitive care, development of a more supportive environment, and parental engagement for oral health promotion were also linked to addressing the historical impacts such as intergenerational trauma, loss of cultural practices, fear and mistrust, and loss of parenting skills.

We used Picker's principles of patient-centered care for analyzing the results due to their relevance, comprehensiveness, and ability to conceptualize various elements of patient-centered care [37]. Our findings support these principles as essential elements in delivering patient-centered care in integrated oral health care [34] (**Table 14**). According to the literature, the patient is a focal point of integrated care [38, 39]. Singer et al. defined integrated patient care and developed a framework based on this definition: "patient care that is coordinated across professionals, facilities, and support systems; continuous over time and between visits; tailored to the patients' needs and preferences; and based on shared responsibility between patient and caregivers for optimizing health" [39]. Our findings emphasizing the significance of care coordination, continuity of care, shared decision making, and the need for patients' health awareness in patient-centered care are consistent with the results of research studies in other health care disciplines in Australia, the United States, and various European countries [38, 40-42]. This can suggest that the key features of patient-centered care are the same in integrated health care irrespective of patients' profile, their type of health problems, and the nature of the health care organization. Similarly, Goodwin et al. compared seven case studies on successful integrated health and social service programs for people with complex needs in seven different countries: Australia, Canada, the Netherlands, New Zealand, Sweden, the United Kingdom, and the United States [43]. All these programs have incorporated patient-centered care by engaging patients and caregivers, and identify patient-centered care as the basis for implementing integrated care programs [43]. Accordingly, our results align with a culturally sensitive community-based integrated care Te Whiringa Ora (Care Connections) program in New Zealand for rural and Indigenous

chronic patients in emphasizing culturally relevant patient-centered care by engaging patients and family members [43, 44]. Our study results are also consistent with the evidence on valuing the role of Indigenous care providers in delivering patient-centered care, including the Te Whiringa Ora program [44, 45].

Our results demonstrating the value of clinical shared decision making and supportive environment as key features of patient-centered care are coherent with the systematic review and original research conducted by Mills et al. on patient-centered care in general dental practice and from both care providers' and patients' perspectives [3, 46]. Moreover, our results are also underpinned by the recommendation of the Department of Health Resources and Services Administration in the United States and other studies on the need for integration of dental and medical care and the importance of the colocation in achieving success in patient-centered care [17, 42].

The themes from our study support the results of the comprehensive scoping reviews and original research conducted by Harnagea et al. showing the validity of Rainbow framework in term of domains (**Table 15**) and facilitators of integrated care including culturally relevant services and existence of public oral health programs [17, 21]. Our study also identified barriers to integration similar to those identified by Harnagea et al. including human resource issues such as lack of trained dental care providers [17, 21].

These results should be interpreted within the consideration of few limitations. Firstly, the study included a small sample of patients visiting the Cree dental clinics. This may have influenced the study results since it didn't include the perspectives of those who are not using dental services. Secondly, few males participated in the study. This could be explained by the fact that women more use dental services than men [47-50]. Finally, though the qualitative approach is not intended for generalizing results, the study participants represented a degree of heterogeneity in terms of demographics and oral health status. The focus on a specific setting and organization in this qualitative study generated rich information that prepares the ground for further research on the integration of oral health into primary health care.

4.3.6 Conclusion

Patients at CBHSSJB acknowledged incorporation of patient-centered care in integrating oral health into primary health care and expressed the need to further strengthen the clinical and organizational integration. Our results support that fostering patient-centered care can improve integrated health care performance.

Table 13. Sociodemographic characteristics of participants (n=14)

Characteristics	No. participants
Gender	
Male	2
Female	12
Age, years	
31-40	7
41-50	3
51-60	4
Ethnicity	
Cree	13
Non-Cree	1
Employment	
Employed	13
Non-employed	1

Table 14. Interconnections between the Picker's Principles of patient-centered care [32] and patient-centered integrated oral health care as reported by Cree patients

Themes	Picker's Principles
Theme 1. Enhanced accessibility	• Access to care • Coordination of care
Theme 2. Creating supportive environment	• Respect for patient's preferences • Emotional support • Physical comfort
Theme 3. Building trust through shared decision making	• Respect for patient's preferences • Information and education
Theme 4. Appreciation of public health programs	• Continuity and transition
Theme 5. Raising oral health awareness	• Information and education • Involvement of family and friends
Theme 6. Growing cultural humility among health care providers	• Respect for patient's preferences

Table 15. Interconnections between the dimensions of integrated care demonstrated in Rainbow Model [29, 30] and patient-centered integrated oral health care as reported by Cree patients

Themes	Key features of each dimension for patient-centered care reported by Cree Patients	Domains of integrated care (Rainbow Model of Integrated Care)
Theme 1. Enhanced accessibility	• Colocation	Organizational
	• Financial mechanisms	Functional
	• Interprofessional collaboration	Organizational
	• Professional competencies	Professional
	• Inadequate human resources	Organizational
Theme 2. Creating supportive environment	• Creating supportive environment	Organizational
Theme 3. Building trust through shared decision making	• Interaction between professional and client _ENREF_21	Clinical
	• Trust	Organizational
Theme 4. Appreciation of public health programs	• Continuity of care	Clinical
	• Public oral health programs	System
Theme 5. Raising oral health awareness	• Parents as oral health promotion champions	Clinical
Theme 6. Growing cultural humility among health care providers	• Linking cultures	Normative

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4.4 Article 4

Relational continuity of oral health care in Indigenous communities: a qualitative study

Authors: Richa Shrivastava[1], Yves Couturier[2], Stefanik Simard-Lebel[1], Felix Girard[1], Nadia Verenna Bendezu Aguirre[1], Jill Torrie[3], Elham Emami[4]

[1]Faculty of Dentistry, Université de Montréal, Montréal, Québec, Canada.

[2]School of Social Work, Université de Sherbrooke, Sherbrooke, Québec, Canada.

[3]Public-Health Department, Cree Board of Health and Social Services of James Bay, Mistissini, Québec, Canada.

[4]Faculty of Dentistry, McGill University, Montreal, Québec, Canada.

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4.4.1 Abstract

Background: The relational continuity of care is an essential function of primary health care. This study reports on the perspectives of Cree communities and their primary health care providers regarding the barriers and enablers of relational continuity of oral health care integrated at a primary health care organization.

Methods: A multiple case study design within a qualitative approach and developmental evaluation methodology were used to conduct this research study in Cree communities of Northern Québec. Maximum variation sampling and snowball techniques were used to recruit the participants. Data collection consisted of individual interviews and focus group discussions. Thematic analysis was conducted which included transcription, debriefing, codification, data display, and interpretation. The consolidated criteria for reporting qualitative studies (COREQ) were used to guide the reporting of study findings.

Results: A total of six focus group discussions and 36 individual interviews were conducted. Five major themes emerged from the thematic analyses for barriers (two) and enablers (three). Themes for barriers included impermanence and lack of effective communication, whereas themes for enablers included culturally competent professionals, working across professional boundaries, and proactive organizational engagement.

Conclusions: Based on these findings, relational continuity can be empowered by effective strategies for overcoming barriers and encouraging enablers, such as recruitment of permanent professionals, organizing cultural competency training, development of a Cree language dental glossary, encouraging inter-professional collaboration, and promoting the organization's efforts.

Keywords: Continuity of patient care, Primary health care, Integrated health care systems, Oral health, Indigenous population

4.4.2 Introduction

For almost four decades, primary health care has been introduced as a gateway that can address the equitable, population-centred service delivery and needs of a complex health care system such as some Indigenous health care organizations [1]. This approach puts emphasis on prevention, community involvement, and a multi-sectoral approach in which the continuity of care plays a central role [1]. Moreover, promoting integrated care is essential in improving continuity of primary health care services [2, 3]. Successful models of integrated care have employed various aspects of continuity of care [4]. Continuity of care has been defined as *the degree to which a series of discrete health care events is experienced by people as coherent and interconnected over time and consistent with their health needs and preferences* [4, 5]. Three types of continuity of care have been discussed in the literature: information, management, and relational continuity [6]. Reid et al. provided the following definition of relational continuity (also known as interpersonal continuity): *an ongoing relationship between patients and providers is the undergirding that connects care over time and bridges discontinuous events* [6]. Relational continuity has been highly valued by patients and linked with higher patient satisfaction and better outcomes [7-9]. It is considered one of the important attributes of primary health care as it is associated with improved communication, trust, empathy, and interpersonal relationship [10-12].

Furthermore, the relational continuity of care as a facilitator of primary health care [13] has been put under the spotlight by the Five Foundations for Integrated Care model, elaborated by the Canadian Nurses Association, the Canadian Medical Association, and the Health Action Lobby [11]. It appears in the vision of patient's medical home presented by the College of Family Physicians of Canada [14], as well as in some implementation studies [13, 15, 16]. According to the World Health Organization report on integrated people-centred health services, approaches to attaining relational continuity include providing consistent care by the same providers, developing continued relationship and trust among providers and patients, and adapting care to patients' social, cultural, and psychological factors [4]. Relational continuity is also improved by the work of dedicated coordinators, such as case managers or navigators [17].

Historically, relational continuity has been inferred most commonly from the degree to which patient care is concentrated in a single physician [13]. However, new models of primary health care internationally and in Canada are moving towards inter-professional team-based care, which may strengthen relational continuity [4, 18]. Furthermore, oral health care disparities due to the geographic isolation of rural and remote communities may also be addressed within the new definition for relational continuity.[4]

Worldwide, Indigenous populations constitute a higher proportion of rural and remote populations and experience significantly poorer health and oral health [19]. These disparities are attributed to multifactorial social determinants including socio-economic, historical, cultural, dietary and lifestyle changes, geographical and health service systems [20, 21]. Approaches and interventions to deal with these disparities include culturally tailored community-based initiatives, integrated dental services into primary health services, incorporating traditional practices into dental care and training of health care professionals [20, 21]. These approaches enables relational continuity by community empowerment, better communication and availability of information, developing more trust and confidence, and minimizing discrimination [4].

For instance, geographical isolation and historical and social inequalities resulting from historical colonization and assimilation policies compromised the engagement in a patient-provider relationship especially for these Indigenous populations and interrupted cultural safety [19]. In fact, one of the essential elements in achieving relational continuity is adapting health care to the patient's cultural beliefs [4]. In culturally safe health care services, health professionals are expected to understand the traditional and historical background of their patients and to integrate this towards their provision of care for their patients [22]. This approach can empower the relational continuity of care in any health care setting [23, 24].

Hence, it is important to assess relational continuity in the evaluation of health care services. Therefore, the objective of this study was to answer this research question: What are the perspectives of patients, primary health care providers, and administrators at an Indigenous health care organization regarding barriers and enablers of relational continuity of oral health care integrated within an Indigenous primary health care organization?

4.4.3 Methods

Study design

This study is nested in a study funded by Canadian Institutes of Health Research entitled: "Oral Health Integrated into Primary Care: Participatory Evaluation of Implementation and Performance in Quebec Cree Communities" [25]. This participatory study used a qualitative approach to get a deeper insight into the perception[6] and lived experiences commonly shared by the study participants in regard to relational continuity of care. We used a multiple case study design within a qualitative approach and developmental evaluation methodology [26, 27]. Developmental evaluation is useful in learning and adapting a complex intervention or program to the emerging conditions in collaboration with the key stakeholders [26]. The case study is an appropriate research design in evaluating and exploring a new or unclear phenomenon within its real-life setting [27].

Study setting

Nine Cree communities of Northern Québec are geographically situated across 450,000 square kilometers, a vast area including nine villages with a population of nearly 18,000. The Cree Board of Health and Social Services of James Bay (CBHSSJB) is responsible for the administration of appropriate health and social services in these communities [28, 29]. The CBHSSJB has developed two Strategic Regional Plans 2004–2014 and 2017–2021 [29] that proposed implementing a model for the integrated delivery of health and social services in the Cree communities including the integration of oral health with primary care [29, 30]. In all communities, CBHSSJB operates Community Miyupimaatisiiun (Wellness) Centres (CMC) that are responsible for general medicine, home care, dentistry, and social services through a team of primary health care providers, along with one regional hospital primarily serving the largest community [31]. Regionally, they have developed a 29-bed Regional Hospital. In these communities, the dental clinic is integrated with the CMC or regional hospital [31]. The dental care providers offer public dental services at the clinic. Moreover, the dental hygienists along with community health representatives provide preventive dental care to the age group 0–9 years via school, daycare, and CMC [31].

Ethical considerations and informed consent

Ethical approval was obtained from the Institutional Review Boards of the Université de Montréal and McGill University, and the research committee of the Cree Board of Health and Social Services of James Bay. This research is compliant with OCAP (ownership, control, access, and possession) principles for conducting research involving First Nations communities [32]. Written informed and oral consent was obtained from the study participants.

Data collection

We purposefully selected four communities in terms of demographic, geographical, cultural, and health and oral health care characteristics to achieve maximum heterogeneity. Using the participative approach, the community health care providers were involved in all aspects of the study including study participant recruitment using snowball technique and maximum variation sampling [33, 34]. Participants included patients, health care providers, and administrators at CBHSSJB in the four selected communities. Data collection included face-to-face individual interviews and focus group discussions (FGD) which were conducted in a private setting at the CMCs and regional hospital. These data were collected by the teams of two researchers trained in qualitative research. There was no existing relationship between the interviewers and the participants. An interview guide with open-ended semi-structured questions was developed based on the study's conceptual framework, the Five Foundations for Integrated Care [11], which was then tailored based on the study participant's profile (patients, administrators, health care providers). The five foundations for integrated care include patient access, patient-centered care, management continuity of care, relational continuity of care, and informational continuity of care [11]. This study was focused on an in-depth investigation of the relational continuity of care.

Data analysis

Data analysis included transcription, debriefing, codification, data display, thematic analysis, and triangulation [35]. All the interviews and focus group discussions were audio-recorded and transcribed verbatim. We employed an inductive thematic analysis approach using ATLAS.ti 8 software and segmented data to analyze the relational continuity of integrated primary oral health care. Initial codes were generated followed by allocation of these codes to potential themes.

Multiple potential themes were identified and grouped under overarching themes for discussion [36]. Transcription, coding, and thematic analyses were conducted by two research trainees (RS, SLL) followed by cross-examination and investigator triangulation of data by a lead researcher (EE) to enhance the quality of the findings. The thematic analysis was revised by the nominated community stakeholders and other team members. The recommendations outlined in the Consolidated Criteria for Reporting Qualitative Studies (COREQ) were utilized to guide the reporting of our findings [37].

4.4.4 Results

A total of six focus group discussions and 36 individual interviews were conducted with 74 health care providers, patients, and administrators. **Table 16** presents the profile of the study participants. Two major themes for barriers and three for enablers were developed from the thematic analyses. To ensure confidentiality, numbers have been used for the identification of participants.

The themes for barriers of relational continuity of care were impermanence and lack of effective communication.

Impermanence

Relational continuity progresses gradually with time and develops trust and confidence in patients towards health care providers. Participants identified the shortage of permanent dentists and their continuous transitions as a barrier and a challenge for the relational continuity of care at the different levels of the health organization. Yet some communities have enough permanent dental health care providers; participants mentioned their shortage as a challenge to relational continuity.

> *He's [dentist] only here temporarily [. . . .] It's difficult for [the dental team] to always readjust to everybody coming and going [. . .] and the population also feel the movement, [. . .] so it's difficult for them to trust the dental team overall.* (Administrator 1, FGD)

They also mentioned that the impermanence of the dental health care providers may be the source of distrust of care, on the part of patients. Development of distrust was noteworthy in the case of providing dental services to children.

> *The first dentist I had, she explained to me that I need a cleaning [. . . .] I relied on that, but she's not here anymore! And then, I've seen another dentist [. . .] he had to fix cavities and he didn't proceed in my last dentist's schedule, like I was supposed to get this cleaning.* (Patient 1, interview)

> *But I know this, my children are [. . .] sometimes they afraid when there is new dentist . . . so, ya, there is a difference [in the approach]. I think [. . .] they don't know the children. (*Patient 2)

Participants desired to have permanent dentists not only to establish individual patient–provider trusted relationship but also to achieve positive health impacts at the community level.

> *May I've got the same dentist since thirty years [. . .] . And I wouldn't change . . . . Because he got all of my things and he follow-up on my things [. . .]. When it's permanent staff, the population is better because she is being to be known by the nurse, by the doctor. When it's permanent staff, the population is always better served.* (Primary health care provider 1, FGD)

Although the patients' desire was to improve relational continuity with the presence of permanent dentists, the shortage of dental workforce in the primary organization hindered this need because of the priority for receiving care rather than investing in relational continuity of care.

> *I told [. . .] you can just call me up my extension, you know just call me whenever there is an opening, I could just run there [. . .] cancel what I am doing and just run there*. (Primary health care provider 2, interview)

Lack of effective communication

Participants linked impermanence to communication gap for the incoming health providers. This communication gap affects the smooth coordination of patient's follow-ups. In this situation,

new care providers may require additional support in navigating this transition phase and in maintaining smooth communication and coordination.

> *The fact that people go and come, doesn't make it easy. And there is not necessarily [. . .] a follow-up on the person that left, had that kind of things going on so when the other people will come and replace, … they should keep following up on that, so it's just to keep the communication going but yeah, we have to have a link with them at all times.* (Patient 3, interview)

Lack of effective bidirectional communication between patients and health care providers was also expressed as an element of relational continuity. The communication in local language facilitates the transmission of information and understanding among community residents. The language barrier was expressed as a major barrier of the relational continuity of care especially in case of children and elderly patients.

> *They don't give us much information when you just talk to them in English. But when you communicate in Cree, it's easier for them.* (Primary health care provider 3, interview)

> *The communication is not there, and they understand very, very limited [. . .] their understanding is basically yes and no.* (Patient 4, interview)

> *I think one of the things [. . .] is the communication, is the language, yes Cree is the predominant language here [. . .] and sometimes the clients come in [. . .] they have their language barrier between the dentist and whatever staff and yet maybe some of them learn in school but don't want to speak the language [. . .] and that's what we see, we have it in kids, we have it in the adults that don't want to speak [. . .] that don't have the full understanding of the English language [. . .].* (Administrator 2, interview)

Lack of all the technical dental terms in the local language was expressed as another challenge to better communication: "*nobody has ever done any work on language in dental to look at what Cree terms are, equivalent for English terms*" (Administrator 3, FGD).

Themes for enablers of the relational continuity included culturally competent professionals, working across professional boundaries, and proactive organizational engagement.

Culturally competent professionals

The presence of local and Indigenous health care providers was identified as instrumental for a culturally competent communication and continuity of care. These local health care providers act as a link between non-Indigenous care providers and patients by translating the communication among them whenever required. They act as the *gatekeeper of the continuity of care* by maintaining the continuity of services in case of professional turnover.

> *When there are little kids and they don't speak English or French or when elders they don't speak French or English and [local health care provider] are here to explain, you're gonna translate. And I think this is really a key factor.* (Dental care provider 1, FGD)

> *They [Indigenous dental secretary or dental assistant] are the bridge between the dentist and the patient, so [. . .] they are Cree and the message goes much faster and easier, because it's in the cultural context, it's much easier to message to transmit easier, like if I tell a patient that you need to brush more, the message sometimes doesn't go through as quick, but if it's by them, it's faster.* (Dental care provider 2, interview)

Working across the professional boundaries

Participants valued interprofessional teamwork and coordination for health care services in the organization. They mentioned that dental health care providers, primary health care providers, and community health representatives were collaboratively working on the patient's care to improve relational continuity of care.

> *It [trust] comes with time, it depends on how you're gonna interact with the assistant, with the secretary, with the hygienist, with the patient, you know with everyone.* (Dental care provider 1, FGD)

> *Well, I do the teachings even if the pamphlets are not there, from what I remember, I do teach the parents to really work on the health of the child.* (Primary health care provider 3, interview)

> *We have a very strong team; team works as an interdisciplinary team and they collaborate*

very well with each other and within the different services that they provide. (Primary health care provider 4, interview)

Proactive organizational engagement

The organization is taking initiatives to maintain the relational continuity of care and fill the communication gaps. The organization has the provision of appointing replacement dentists in case of absence of working dentists as a step to fill the gaps in care continuity.

Sometimes we have "permanent replacing dentist" [. . .]. That's like a replacing dentist only doing replacement. We are calling them permanent replacing dentists as they are coming often in the same community, but they are replacing the permanent dentists [. . .]. So [. . .] they can build, and they have built the trust between patients. (Dental care provider 1, FGD)

Other initiatives included organizing meetings for new care providers and developing a guideline for replacements and new dentists that helps them to understand their role and work culture at the clinic.

It is a job description, it is the same document we use as a guideline for dentist when they arrive, and they are new. And it gets a little bit better, but then with time, we lose them, and we have someone new and it's hard to keep the same balance. But at least with that new tool [that is] provided to all the new dentists that come in the territory and it's basically a guideline without putting any name on the forms: what goes well, what does not, what improves, what needs to be worked on more. (Administrator 1, FGD)

When we have new workers, we have a meeting with them [. . .] we talk with them about this is the way you fill the file, etc. (Dental care provider 3, interview)

4.4.5 Discussion

Relational continuity is co-created between the patients and primary health care providers characterized by their shared understanding, good communication, and addressing patients' needs in a coordinated way [38]. The results of our study highlighted the importance of professional permanence, communication, inter-professional coordination, and culturally competent care

providers in a proactive health care organization that positively favours relational continuity. Some of the barriers in this study, such as lack of workforce, long waiting list, and language barriers, and enablers such as cultural competency, were similar to those previously found on the issue of access to care in rural and remote communities [39-41].

As per Rainbow model of integrated care in a primary health care setup, integration extends from clinical integration (micro level), professional and organizational integration (meso level) and system integration (macro level), with normative and functional integration as enablers across all levels [2, 42]. Our results identified elements of clinical, professional, organizational ,normative and functional integrations as enablers of relational continuity in this Indigenous integrated primary health care setup [2] .

Several studies have been conducted to evaluate the impact of relational continuity of care on health and health care outcomes in various health care domains including long term conditions and chronic diseases such as diabetes and asthma [43-47], special needs health care [48-50], and maternal health care [15]. However, to the best of our knowledge, this study is the first to explore the perspective of a northern Indigenous community on relational continuity in terms of oral health care in a primary care organization.

Relational continuity and professionals' permanency

Consistency of professionals is considered as an influencer for relational continuity in establishing a continued patient–provider relationship with a sense of trust and affiliation, patient–provider mutual understanding, and better quality of consultations [52]. Similar to previous studies, our results have also identified that turnover of health care providers and inconsistent staffing jeopardize relational continuity at the organizational level [19, 51]. Previous studies also support our results that trust and confidence with a physician develop over time [53-55]. The higher turnover of health care providers results in dissatisfaction, isolation, or helplessness and confusion due to receiving different treatment and medical advice [46, 52]. Furthermore, the insufficiency of professionals negatively affects relational continuity due to unavailability of an appointment at a suitable time and long waiting times for appointments, which hampers service utilization [56] .

Relational continuity and doctor-patient communication

Evidence on doctor–patient communication linked effective communication with improved health care quality measures including patient satisfaction, treatment compliance, and health outcomes, which in turn can improve the relational continuity of care [57]. In the present study, we found barriers to effective communication between the oral health provider and patients especially in children and elderly patients. An ineffective communication due to language barriers has been associated with frustration and feeling of neglect and isolation among patients [56]. The presence of an interpreter not only improves the quality of the patient–provider conversation but also provides more eloquent explanations of the patient's condition [56]. This is observed as an enabler for primary oral health care integration in the present study as local health care providers were noticed taking this opportunity. However, non-Indigenous primary health care providers in these communities need to understand historical, sociodemographic, political, and cultural contexts of rural Indigenous health and health inequities to provide effective relational continuity of care [19].

Relational continuity and interprofessional collaboration

Our results are consistent with the WHO report suggesting that relational continuity facilitates effective care coordination in an integrated health care setting [4]. Shared responsibility and collaboration among dental care and primary care providers are instrumental in promoting the integration of oral health care [58]. This was observed to be an enabler of relational continuity, and further efforts will be required to stimulate ongoing communication by defining, implementing, and evaluating each health provider's specific role.

Recommendations

Based on the study results, the following strategies are recommended by the participants to overcome barriers and promote enablers in Cree First Nations and other northern multi-lingual communities:

- Health care policies and practical strategies based on financial and non-financial incentives (such as spousal employment opportunities, further education and training opportunities, social needs incentives such as housing, transport, and care and education of children) to promote the recruitment of permanent health care providers.
- Custom training of local/ Indigenous people to become professional health care providers.
- Encouraging better integration of health care workers from outside by promoting effective communication with the development of specific cultural competency training for health care professionals to learn, in this case, the Cree language, to better understand local traditions.
- Engaging, in this case, the Cree communities and elders to collaborate in the development of a Cree language dental glossary to help improve communication.
- Encouraging inter-professional health care collaboration by providing education and training in oral health care and by recruiting trained Dental Community Health Representatives to act as a link between the different health sectors.

Limitations and research implications

In the long term, progressively working on providing relational continuity in an Indigenous health care organization could help in improving inequitable oral health service delivery in rural Indigenous communities [19]. We believe that our results and recommendations can be applied to other Indigenous health care organizations. Qualitative exploration in this study enabled us to gather in-depth information on relational continuity in integrating oral health care in an Indigenous primary health care organization from patients', health care providers', and administrators' perspectives. However, due to the nature of qualitative studies, the study results may not be generalizable or directly transferable to other international health care settings. Further longitudinal studies are needed to understand factors associated with ongoing relational continuity of oral health care at a primary health care organization.

4.4.6 Conclusion

At CBHSSJB, impermanence of dental health providers and lack of effective communication skills in local language were key barriers in providing relational continuity of care; however, cultural competence of health care providers and team working across primary health services appear as major enablers. Based on the study findings, relational continuity can be empowered by effective strategies for overcoming barriers and encouraging enablers such as recruitment of permanent professionals, organizing cultural competency training, encouraging inter-professional collaboration, and promoting the organization's efforts.

Table 16. Profile of the study participants

(Total 45 participants in focus group discussions and 36 in personal interviews)

S.No.	Participants Categories	Number of participants*	Gender distribution		Ethnicity	
			Male	Female	Cree	Non-Cree
1	Dental health care workforce	20	4	16	9	11
2	Community health care providers	26	4	22	16	10
2	Administrators	18	7	11	9	9
3	Patients	10	1	9	9	1

*A total of seven participants were involved in both individual interviews and focus group discussions.

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CHAPTER 5. DISCUSSION

Two decades ago, the common risk factor approach that addresses risk factors common to many chronic conditions, was extended to oral health, considering that oral health problems share common risk factors with multiple major chronic diseases [283]. This approach developed a conceptual basis for the integration of oral health into primary health care services [283]. Most recently in December 2020, a landmark oral health resolution was passed by the 148th session of the Executive Board of the World Health Organization aiming to achieve better oral health by the year 2030 [284]. This report highlighted the importance of using integrated approaches to address common risk factors of noncommunicable diseases as well as integrated prevention measures, and access to primary oral health care [284]. Furthermore, in 2021, the World Dental Federation has released its report *Vision 2030: Delivering Optimal Oral Health for All*, which aims to integrate essential oral health care services into health care systems in every country [285].

The Cree Board of Health and Social Services of James Bay (CBHSSJB), an administrative visionary authority for the health and social services of the Cree territory of James Bay, adopted an integrated health care approach including oral health in 2004 [25, 286]. However, the evaluation of this strategic plan necessitated a comprehensive assessment. Thus, this PhD research study aimed to examine the integration of oral health into primary health care in the Quebec Cree communities of James Bay.

In the previous chapter, we reported the results of this doctoral project in the form of four articles. These results addressed the following two-fold specific objectives of the thesis:

I. To systematically map the available programs and their outcomes on the integrated primary oral health care programs in Indigenous communities underpinned by the two-eyed seeing concept.

II. To explore how and to what extent the integration of oral health into primary care addresses the oral health needs of the Cree communities.

This chapter discuss the main findings of the scoping study and multiple case study. It also highlights contributions of this study to the advancement of knowledge, as well as providing recommendations for health care organizations and policy makers on oral health care services in rela-

tion to clinical practice, education and training as well as policy planning for Indigenous populations. We also highlight the remaining gap in research and note the need for further research studies.

5.1 Scoping review

This part of the PhD research project systematically mapped the types and outcomes of integrated primary oral health care models in Indigenous communities and also identified the essential approaches for integrating health care services for Indigenous populations. To the best of our knowledge, this is the first time that integrated oral health care has been reviewed in the context of Indigenous populations and thus provides evidence that can be used for the optimization of integrated primary oral health care approaches in Indigenous health care organizations.

We used **Marshall's two-eyed seeing framework** for the first time in a scoping review in the field of dentistry to perform a thorough analysis of the data and to acknowledge Indigenous knowledge and culture and their impacts on primary oral health services [213, 287]. This framework values Indigenous ways of knowing by drawing together the Indigenous and biomedical perspectives and knowledge [208]. Similar to our study, it has also been used by Rowen et al. [213, 288] as a conceptual framework for performing a scoping review on mapping cultural interventions in addiction treatments in Indigenous populations. Furthermore, the two-eyed seeing framework has already been used in conducting Indigenous primary research in various disciplines including medicine, nursing, anthropology, education, and environmental studies [289-291].

The methodology of this scoping review was developed based on the Arksey and O'Malley's framework [210] and additional recommendations for conducting and reporting scoping reviews by Levac et al. [211]. In the Arksey and O'Malley methodology, *the sixth phase is optional and there is lack of clarity exists about when, how and why to consult with stakeholders and how to integrate the information with study findings*. However, as per Levac et al., the sixth phase is recommended and considered to be an essential phase.

According to Levac et al. [211], the sixth stage (consultation) should *clearly establish a purpose for the consultation. The preliminary findings can be used as a foundation to inform the consultation. There should be clear articulation of the type of stakeholders to consult and how data will be collected, analyzed, reported, and integrated within the overall study outcome. This phase should also incorporate opportunities for knowledge transfer and exchange with stakeholders in the field.* Therefore, in our scoping review article, we have specifically focused on the importance of sixth phase as per the details mentioned by Levac et al.

According to Tricco et al. article [214] on PRISMA-ScR checklist, item 14 mentions that '*give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram*'. The authors elaborated the 14th item of checklist as: '*Consistent with the original PRISMA statement, we recommend including a flow diagram that details the reasons for exclusion at the full-text level of screening at a minimum*'. Though the diagram used in the thesis is not exactly similar to ideal PRISMA flow diagram, it is consistent with the PRISMA statement.

The review identified 29 publications from 1972 to 2019 portraying 30 programs in Australia, the USA, and Canada. Four categories of programs were introduced in these countries: oral health promotion and prevention programs; comprehensive dental services; fly in-fly out dental services; and remote services using a teledentistry platform. We classified the approaches used in these programs into two large categories, biomedical and Indigenous, and found a large difference between these two approaches.

The biomedical approaches were primarily focused on leadership and governance, administration and funding, capacity building, infrastructure and technology, teamwork, and evidence-based practice. By contrast, Indigenous approaches emphasized the vision for holistic health, culturally appropriate services, community engagement, shared responsibility, and cultural safety. Unlike biomedical approaches, Indigenous approaches were influenced by social, emotional, and spiritual causes of health which played an important role in the success of integration models among Indigenous populations. Our review is in line with the existing literature.

A 2009 systematic review on health system integration by Suter et al. [292] found that the biomedical principles for successful integrated health care include: comprehensive services across the care continuum, patient-centered care, geographic coverage for better access, care delivery through interprofessional teams, performance management, information systems, organizational culture and leadership, physician integration, governance structure, and financial management [292]. Other studies have identified the key principles of Indigenous approaches similar to our findings, such as Indigenous communities' ownership, empowerment, capacity building, and self-determination in improving their local health services and health outcomes [293-295]. Furthermore, several Indigenous health service organizations such as Indian Health Services, First Nations Health services, and Aboriginal Community-Controlled Health Organizations have also put an emphasis on the principle of Indigenous peoples' right of ownership and participation [18, 296, 297].

A decade after the Suter et al. review, Harfield et al. [18] conducted a review identifying the characteristics of Indigenous primary health care models and identified eight characteristics [18]. Among those characteristics, accessible health services, quality improvement, and a flexible approach to care were consistent with biomedical approaches identified in our scoping review [18], whereas community participation, culturally appropriate and skilled workforce, holistic health care, self-determination and empowerment, and culture were coherent with the Indigenous approaches we identified [18]. Likewise, recently Henderson et al. [298] identified implementation priorities for Indigenous primary health care innovations in Alberta in collaboration with pan-Canadian Indigenous stakeholders. These priorities included Indigenous governance, community ownership, and service administration with equitable community engagement, and financing [298]. These findings support our results suggesting that combining biomedical and Indigenous approaches will be crucial to the success of Indigenous integrated health care systems.

Program outcomes

Our scoping review findings revealed that most of these programs were assessed considering biomedical approaches and did not take into account the holistic outcomes pertinent to Indigenous approaches. Furthermore, in those programs, when assessing the outcomes from Indigenous perspectives, measurement of the spiritual dimension was missing.

According to a 2006 Lancet viewpoint commentary by Smylie et al. [299], the Indigenous health and healthcare performance measurement systems in Canada, Australia, and New Zealand are biomedical in nature and primarily focus on physical and disease-based measures. These systems are devoid of Indigenous culture, values, and priorities, as well as the Indigenous concept of health [299]. As a results, these authors recommended to develop Indigenous- specific indicators that emphasize Indigenous cultural values and priorities [299]. Similarly, Anderson et al. [300] in a discussion paper on First Nations, Inuit and Métis Health Indicators in Canada in 2006 reported the need to develop Indigenous-specific and Indigenous-centered health information systems that are instilled with culturally appropriate principles of Indigenous well-being [300]. Such information systems would be complementary to the universally comparable biomedical health indicators [300].

Accordingly in 2013, the International Group for Indigenous Health Measurement including countries such as Australia, Canada, New Zealand, and the United States conducted a workshop in Montreal and provided a series of recommendations on Indigenous-relevant indicators which mostly revolved around Indigenous community engagement and ownership [301]. In 2017 at a meeting in Atlanta, this group later presented a holistic and culturally relevant framework for the Health Services Measurement for Indigenous Populations. This framework included measurement aspects on social determinants such as culture and racism, as well as community determination and empowerment, in addition to biomedical health indicators [302]. They also reported a lack of epidemiological statistics on Indigenous ways of knowing and the impact of colonization including intergenerational trauma and disruption to family, culture, spirituality, and relationships [302].

In line with the findings of this thesis scoping review, available literature suggests that integrated oral health care programs and interventions that are led and co-designed by Indigenous communities are more likely to result in better oral health outcomes [68, 303-305]. For instance, Dimitropoulos et al. in 2020 reported that such community-led programs resulted in significant decrease in dental caries and periodontal diseases, and also increased the prevalence of positive oral hygiene behaviors in rural and remote Indigenous communities in Australia [303]. Tiwari's review from five nations (United States, Canada, Brazil, Australia, and New Zealand) in 2018 also found that culturally adapted strategies and use of community workers to deliver oral health interventions among Indigenous populations can contribute to improved oral health outcomes [68].

In conclusion, Indigenous models should be based on community capacity building and community empowerment [306, 307]. These models should be designed by Indigenous people for Indigenous people and should define and integrate Indigenous theoretical knowledge and culture for Indigenous health policies and implementations [306, 307].

5.2. Multiple case study

This part of the PhD research project evaluated integration of oral health within primary health care at the CBHSSJB using a multiple case study design within a qualitative approach and developmental evaluation methodology. This section presents the relevance of methodological choices, discusses the results of the case study and outlines the links between the results of the scoping review and the results of the case study.

5.2.1 Relevance of the methodological choices

Although qualitative case study research is a proven and well-established method, it appears to be less common in oral health services research. In the current research, this methodology has been used to better understand the dynamic processes of integrated oral health care delivery. Furthermore, the use of qualitative multiple case study design allowed live communications and a close connection between study participants and researchers as well as among participants. Gathering knowledge via oral communication is coherent with Indigenous paradigms and gives

credibility to the research findings from the Indigenous viewpoint [223]. The developmental evaluation helps to understand the interrelationship between multiple components of complex systems by employing system thinking, and provides structured and actionable information for decision-making [219, 230]. This type of evaluation can help in addressing complex health system issues in culturally diverse contexts [230] and has been already used in assessing primary health care in Indigenous populations [230, 232].

Among various frameworks of developmental evaluation, appreciative inquiry (AI) was used as a methodological framework. It provided structured practical guidance and set of structured principles to guide the step-by-step approach [308]. In addition, we used three conceptual frameworks, the Rainbow model of integrated care [136, 263], the five foundations for integrated care model [193], and Picker's principles of patient-centered care [264] based on the consultation with the Cree stakeholders and the approval of the community members during the planning meeting for the research project [26] (as described in the Chapter 3 Methodology and Chapter 4 Results).

The interview guides (Appendix 3) were developed based on the Rainbow model of integrated care, the five foundations for integrated care model, and AI [31, 136, 193, 263]. The Rainbow model of integrated care [136, 263] and the five foundations for integrated care model [193] were used in analyzing data and assessing the strategies and dimensions of the integration of primary oral health care at the CBHSSJB. The five foundations for integrated care model [193] was also used to gain a comprehensive understanding of the relational continuity care of care at the CBHSSJB. Furthermore, the Picker's principles of patient-centered care [264] along with the Rainbow model of integrated care [136, 263] were used to better understand the patient's perspective of patient-centered care at this organization.

5.2.1.1 Relevance of methodological framework: Appreciative inquiry

Indigenous health care systems are complex and heterogenous due to diverse social, historical, and political influences [309]. Thus, the evaluation of health care systems cannot only be achieved by using conventional Western research methods [243]. AI uses a community-based participatory approach to address these complex situations [243]. To our knowledge, this is the first study that uses AI in the field of Indigenous oral health research.

The fundamental presumption of AI is that the community knows the best, and the community has the potential to address its problems [310]. As an asset-based model, AI empowers communities by appreciating their strengths [244]. AI has been successfully used in Indigenous health care evaluation in Australia and Canada [246, 247, 311, 312]. Examples of its use include strengthening the Aboriginal Community Wellbeing Framework; assessing the access and experience of health services by Aboriginal and Torres Strait Islander peoples; evaluating continuing education opportunities for practitioners in Indigenous areas; and promoting First Nations child, youth, and family well-being [246, 247, 311, 312]. It has also been used in fields other than health care such as youth development, education, and prison performance among Indigenous people in Australia and Canada [245, 248, 313]. According to these studies, AI has the ability to identify the program's strengths and exemplify the program's effectiveness while taking Indigenous knowledge and culture into account.

The AI phases of discovery, dream, design, and destiny align well with the Indigenous ways of life, in which the individual sources of knowledge are dreams, spirit, and visions [226]. These dreams, spirits, and visions influence every aspect of one's life [314, 315] and allow one "*to see the beauty along the way and the goodness in others*" [314].

Valentijn's Rainbow model of integrated care

This model was developed by Valentijn in 2013 as a result of literature reviews in primary care settings, along with a series of Delphi studies and a panel of international experts [135]. The Rainbow model of integrated care offers better understanding of multidimensional relationships between different types of integration and in turn allows an empirical approach to evaluating integrated care [316]. The relevance of this model could be justified by its comprehensiveness that includes the dimensions of both integrated care and primary care [135, 136]. Furthermore, its validation in various countries allows for international comparisons [316-319]. This model has been used for evaluating integrated primary services in the Netherlands [316], Singapore [317], Australia [318], Canada [7, 8, 198], and most recently in China [319]. A few studies, such as a scoping review and a case study conducted by Harnagea et al., have also used this framework in

assessing integrated primary oral health care in rural and urban health care organizations in Quebec, Canada [7, 8, 198]. According to these studies, the Rainbow model of integrated care is comprehensive in nature and is capable of capturing the wide range of integration approaches [316-319]. It can also be used to monitor the progress of integrated care in a given area over a period of time [316-319].

To the best of our knowledge, this PhD research project is the first study that has used this framework in an Indigenous population. This framework is coherent with the Indigenous worldview and ideologies that embrace the holistic concept of health [50, 320]. In our study, this model guided development of the interview guide and analysis of the multiple case study as well as patient-centered integrated care evaluations. The model allowed us to identify the key strategies and approaches of primary oral health integration as per the domains of integrated care from the perspectives of patients, health professionals, and administrators at the CBHSSJB organization. It also helped us in identifying the challenges and opportunities for integrated care delivery within and across multiple levels of the Cree health system based on the perspectives of all stakeholders.

Five foundations for integrated care model

This model was developed as a result of two summit workshops and steering committee reviews hosted in 2012–13 by the Canadian Nurse Association, Canadian Medical Association, and Health Action Lobby [193]. These workshops included representatives from health-provider organizations and the general public in order to develop a functionally integrated health system in Canada along the continuum of care [193]. To our knowledge, this model was used for the first time in this PhD research project in the evaluation of integrated services. It was used to develop the interview guide and to analyze the multiple case study data. It helped in capturing the extent of all five foundations of integration at the CBHSSJB including access, patient-centered care, management, and relational and informational continuity of care.

Eight Picker principles of patient-centered care

This model was specifically used in analyzing patients' perspectives of patient-centered integrated oral health care at the CBHSSJB. Picker's principles include respect for the patient's preferences, information and education, access to care, emotional support, involvement of family and friends, continuity and transition, physical comfort, and coordination of care [264]. These principles were developed by the Picker Institute and Harvard Medical School via focus group discussions involving patients, family members, and health care professionals, and by reviewing patient-centered care literature [321]. Its use in our study can be justified by its relevance, comprehensiveness, and ability to conceptualize various elements of patient-centered care [322]. It guided exploring and determining the scope of elements of patient centered care within an integrated care network.

5.2.2 Findings of multiple case study

The results of this case study, together with the findings of the scoping review, contribute to a deeper understanding of integrated primary oral health care in Indigenous populations.

5.2.2.1 Integrated primary oral health care model tailored for Cree communities

Our findings acknowledge the CBHSSJB's efforts to design and implement an effective integrated care model adapted to local communities' contexts and needs. Integrated health care is complex in nature and is influenced by multidimensional factors such as an organization's setting as well as cultural, history, and geographical factors [5, 323]. According to the WHO's European Commission, "*it matters a lot how integrated care is designed and implemented to fit local contexts and needs*" [324]. The CBHSSJB design of primary oral health care integration has addressed the Cree population's needs in various ways including:

a. Strategic regional plans: The CBHSSJB has developed strategic plans for delivering integrated health and social services for all Cree communities of Eeyou Istchee under the strong clinical and administrative leadership of the Cree Health Board as a regional health council [25, 45]. Integrated dental services were an innovative priority identified in the CBHSSJB first Strategic Re-

gional Plan in 2004 [25]. The second Strategic Regional Plan 2016 does not specifically name dental services; however, in continuity with the 2004 plan, they are assumed along with other types of front-line services, to be the locus where the organization is focusing on developing the integrated services model.

b. Adoption of Indigenously driven model: In the Indigenously driven model, health services are managed by Indigenous peoples, and local Indigenous individuals are employed to ensure the provision of culturally safe services [325, 326]. Furthermore, the location of health services within the communities they serve makes them more accessible and easily informed on the needs of the population [325].

c. System-based holistic approach: The system-based approach seeks to improve health by taking into account not just the health system, but also the multiple factors involved in patients' health care such as social determinants of health, environment, and human biology, in a holistic way. According to a discussion paper by Kaplan et al. in 2013, a "*systems based approach can help with the design and integration of people, processes, policies, and organizations to promote better health at lower cost*" [327]. At the CBHSSJB, all the components of integrated care and their interrelatedness and connections to the administrators, care providers, patients, families, and communities demonstrate a system-based focus.

d. Introduction of a life-course approach to health care: The organization has developed life-course based health care service model beginning with maternal and child health, through to youth, adult, and elder health and support (Awash, Uschiniichisuu, and Chishaayiyuu) [203].

e. Evidence-based approach: The CBHSSJB meets the common essential features required for successful integrated care models as outlined by the University of Birmingham's Health Service Management Center in 2001 [142, 328]. These features include a common cause; common vision and strategy; joint funding and planning with a clear focus on shared outcomes and deliverables; and joint delivery with a strong leadership, evaluation, and quality improvement process [142, 328]. Analogous to this, the CBHSSJB's implementation of integrated care is coherent with the core and enabling factors for implementing integrated care described by Maruthappu et al. [329]

in 2015. These core factors include adequate financing, clinical cultural changes, supportive regulation, and flexible administrative organization. Other elements such as information technology platforms, clinical leadership, common values, and periodic evaluation served as enablers of integrated care application [329].

5.2.2.2 Dimensions and extent of integrated care at the CBHSSJB

The PhD project findings suggest that at the micro level, participants appreciated clinical integration of oral health services via interprofessional practice and continuity of care. At the meso level, co-location, interprofessional collaboration, care-coordination, and referral mechanisms facilitated organizational and professional integration. At the macro level, study participants valued systemic integration via community-based outreach services, financial support, organizational support, and leadership. Most participants appreciated functional integration in the form of effective logistical support and information system via shared physical health records. The normative integration was found in the form of culturally safe care as well as the presence of Indigenous health workers at the organization. Moreover, the organization's strategic plan in highlighting the common vision of integration acted as a facilitator to integration in the normative domain.

The extent of integration can be described as per Leutz's description of levels of integration: linkage, coordination, and full integration [330]. Integrated oral health care in the CBHSSJB at the linkage level included screening to identify emerging dental needs, referrals, and follow-up [330]. At the coordination level, integrated oral health care included development and implementation of policies, coordinated and smooth use of services, and sharing clinical information in a planned manner [330]. At the full integration level, the CBHSSJB has multidisciplinary team management and controlled financial mechanisms [330]. According to Atchison et al., integration of dental care in primary care can extend from the level of "*no integration*" to "*integration through a formal closed-loop referral process*" (such as simple agreements on referral of patients), then to "*integrating through shared financing*," followed by "*co-location and closer integration of medical and dental providers*" [167]. In this regard, the CBHSSJB represents an example of co-location and closer integration of medical and dental providers [167].

Overall, the integrated primary oral health care at the CBHSSJB mainly corresponds to the coordination and linkage and some degree of integration [330]. To have full integration at the organization, it is important that key stakeholders consider medical and dental units as a single dependent unit rather than two independent units [149, 330]. Strategies to strengthen integrated primary oral health care at the CBHSSJB could include development of a smooth case management system, better cross-referral processes, interprofessional education and training, as well as defined role of medical providers in dental care and vice versa.

When comparing the integrated oral health services in each of the four cases, the provision of health and oral health care services and elements of integrated primary oral health care were comparable across the cases. The fact that health care management is carried out by a single health care organization (CBHSSJB) explains these commonalities among cases. For example, provision of co-location, free dental services, Community-based oral health promotive and preventive services, inter-professional coordination, and collaboration have been implemented in accordance with standard guidelines and criteria in all communities. This organization ensures that all health-care strategies and plans are implemented for all communities, and that services are accessible based on the community's needs. For instance, in comparison to smaller communities (Communities 3 and 4), larger communities (communities 1 and 2) have a greater number of care providers; larger communities also serve as referral centers for care delivery.

5.2.2.3 Characteristics of integrated primary oral health care

1) Access to integrated dental services

Improving access to health care is one of the major goals to introduce integrated care along with improving quality, user satisfaction, and efficiency [139]. Various organizations such as the Institute of Medicine and the World Health Organization have recommended an integrated oral health care approach as an important element in improving people's access to dental care [11, 177, 284, 331]. A recent scoping review by Pinter [332] also identified access to health care as the main performance indicator of the process of integrated care programs on chronic diseases.

Our study findings also demonstrated that the study participants valued the improved accessibility of dental service in terms of its location in their communities as well as co-location with the

Community Miyupimaatisiiun Centre. Our study also supports the Harnagea et al. [8] scoping review results acknowledging improved access to dental care as one of the key outcomes of integrating oral health into primary care. However, in our study, participants were concerned about the timely access to oral health care due to the long wait times. Previous studies including the cross-sectional study by Motloba et al. [333] and a narrative review by McIntyre and Chow [334] also identified long wait times as a barrier to access to primary health care. These challenges can be improved by development of new programs in collaboration with academic organizations such as faculties of dentistry, to provide oral health care and education via outreach, residency programs, and use of technologies such as teledentistry [335].

2) Patient-centered integrated care

Article 3 of this thesis focused on patient-centered integrated care at the CBHSSJB from patients' perspectives. Patients who participated in our study appreciated patient-centered oral health care and linked this to the continuity of care and favorable clinician-patient interactions. Patients expressed that trust in the health care system could be developed through shared decision-making, and optimal professional competencies. Nevertheless, they recognized that patient-centered care could be optimized by creation of a supportive environment including a welcoming and empathetic dental clinic environment, public oral health care programs, financial support, and culturally sensitive oral health services. These results are in line with the Goodwin et al. [336] study, in which integrated health and social service programs for people with complex needs were compared in seven different countries including Australia, Canada, the Netherlands, New Zealand, Sweden, the UK, and the USA. All seven programs actively engaged patients and their caregivers as well as recognizing a patient-centered approach as the foundation for implementing integrated care [336].

Our study results support the findings of the Bedos research group [337-339] regarding person-centered dental care. The person-centered dental care model places emphasis on understanding the patient's illness, patient partnership in treatment decision-making, and carrying out interventions that take into account the patient's needs, fears, and expectations [337]. Empathy, mutual respect, a trust-based doctor-patient relationship, and shared decision-making seem to be important elements in person-centered dental care [339].

3) Continuity of care

Relational continuity of care:

Article 4 of this thesis focused on relational continuity of care at the CBHSSJB. Our findings suggest that the presence of culturally competent professionals, teams working across primary health care services, and organizations' proactiveness facilitated the relational continuity of care. However, professional impermanence and lack of effective communication especially due to the language barrier were the main challenges in improving the relational continuity of care in the CBHSSJB organization.

Several studies conducted by the Haggerty et al. research group [340-345] on relational continuity in health care settings demonstrated that relational continuity is one of the core attributes of any primary health care model. According to these studies' findings, the patient–health care provider relationship as well as professional consistency influence relational continuity [340, 344]. These findings also suggest that variables such as regular use of services, doctor's knowledge of the patients' medical details, and the quality of doctor-patient communication could be used to assess relational continuity of care [345]. Furthermore, a qualitative study conducted by Waibel et al. [346] among the users of the Catalan national health system in Spain showed that professional consistency (such as patient assignment to a single primary care provider and consistency of appointments with the same primary care provider), professional competencies, and effective doctor-patient communications play key roles in relational continuity of care [346].

Our study findings support these previous publications and are also in line with previous studies and various health organizational reports showing that the relational continuity facilitates professionals' permanency, doctor-patient communication, and interprofessional collaboration in integrated health care settings [347-351]. In our study, the shortage of permanent dentists, inconsistent staffing, and turnover of health care providers negatively affected relational continuity. These results are consistent with Kristjansson et al. [352] who conducted a cross-sectional study in 137 primary care practices in Ontario, Canada. Their study reported lower relational continuity in rural areas of Canada due to limited numbers of physicians in these areas [352]. Similarly, previous studies such as a focus group study among diabetic patients in primary care by Alazri et al. in 2006 [353] and a meta-synthesis of qualitative studies on patients' perceptions of

continuity of care by Waibel et al. [354] in 2012 showed that inconsistent staffing and high turnover of health care providers adversely impacts relational continuity. This can be explained by the fact that these factors could contribute to patients' dissatisfaction and thus indirectly influence relational continuity of care.

Management and informational continuity of care

Article 2 of this thesis described the management and informational continuity of care at the CBHSSJB. Management continuity is a consistent and coherent approach to the complementary and timely management of health conditions [193, 355], whereas information continuity depends on systematic collection of patient's information, adequate medical records, and interprofessional communications [356]. It ensures that the information flows well with patients and across the health system [356, 357]. Better informational continuity can lead to better coordination and, as a result, better management continuity [358]. A qualitative meta-synthesis by Waibel et al. [354] in 2012 and a retrospective study at a primary care setting in Ontario by Wong et al. [359] in 2019 evaluated the quality of informational continuity in health care settings. Similar to our findings, these studies found that informational continuity is fostered by comprehensive shared patient records, communication and interaction among care providers, transfer of medical information across health care settings, and smoother referral processes [354, 359].

In our research, management and informational continuity were established in the form of care-coordination and referral mechanisms, an effective information system, and integrated medical-dental physical records at the CBHSSJB. However, study participants expressed the need for chronic-conditions case management, professional role clarity, stringent referral protocols, and shared electronic health records for better integrated dental services at the health center.

Breton et al. [355] conducted a cross-sectional survey in 2012 to compare management continuity in a highly and a poorly integrated local health network in Quebec. This cross-sectional study used the indicators of management continuity as shown by our findings including care coordination, role clarity, information flow between health care providers, and awareness of health care plans [355]. Their findings revealed that the level of management continuity was higher in the highly integrated local health network than in the poorly integrated network [355]. Likewise, a

qualitative study conducted in 2016 by Waibel et al. [360] on the Catalan national health system in Spain reported that management continuity is influenced by the primary health care model with clear definition of roles and responsibilities, care coordination mechanisms, and the care providers' commitment to patient care [360]. These results support our study findings.

4. Culturally integrated oral health care

All four articles in this PhD thesis highlight the benefits of integrating culturally safe oral health services into primary health care in Indigenous communities. In line with our findings, the World Health Organization has also recognized the integration of traditional health practices as a key concept of culturally sensitive primary health care [361, 362].

Various programs such as the *First Nations Health Program* for Yukon First Nations, *Family Wellness Warriors Initiative strategies* for Alaska Native people, and a *traditional wellness program* in Thunder Bay have integrated culturally safe practices such as traditional foods, medicinal plants, cultural programs, and traditional ceremonies into primary care and have shown better health outcomes [326, 363, 364]. Previous scoping review by Harfield et al. [18] and qualitative evaluation studies among Indigenous Australians [293, 294] have also emphasized that Indigenous communities' ownership, empowerment, and self-determination will lead to better local health care services and health outcomes.

It should be noted that the CBHSSJB under the guidance of elders and traditional healers has created the *Nishiiyuu* department aiming to integrate traditional healing pathways into the health care system to achieve better health and well-being [286]. This explains our study findings and shows the importance of the CBHSSJB's strategic planning and its positive impact on oral health care services such as the presence of Cree oral health care professionals in dental teams as well as non-Cree health professionals' interest in learning Cree culture, traditions, and language. Our findings corroborate the findings of a literature review in 2018 by Lewis and Myhra [365], which indicated the importance of learning Indigenous people's values, health beliefs, and culturally acceptable interpersonal behaviors in delivering culturally appropriate care [365]. Studies on numerous oral health programs in Indigenous communities in Australia and North America have also showed that culturally integrated care has been facilitated by community ownership

and partnership, engaging community elders and trained Indigenous health workers in the community care, and using culturally adapted oral health education strategies such as development of educational tools in native languages and oral health promotion at local and cultural events [119, 123, 125-129, 131, 132, 154, 200, 297, 366-378].

Justification to perform separate analysis for patient centered care and relational continuity:

1. During the video-conferencing workshop in the discovery phase of Appreciative inquiry, various evaluation models were discussed with the stakeholders. Accordingly, the Five Foundations of Integrated Care model was selected by them. The five foundations in this model are Access, Patient-centered care, and continuity of relational, management and information.

During initial data collection, we realized the significance and relevance of relational continuity and patient-centered care among the participants. Therefore, we discussed with Cree Health Board and with their permission, we decided to conduct the separate analysis from these two specific point of views.

2. Moreover, these findings have been approved by Cree Health Board also. They also appreciated our efforts in considering these aspects.

3. From the scientific evidence point of view, there is very limited data on the role of relational continuity and patient-centered care in oral health care in the available scientific literature. Our research work in these areas would help in expanding the in-depth understanding of relational continuity and patient centered care in primary oral health care.

4. Our research findings in this direction will also help in knowledge translation on the importance of relational continuity and patient centered care in primary oral health care. As per our review of literature, similar circumstances are seen in other Indigenous communities in Canada as well. This point also justifies our approach for better understanding of relational continuity and patient centered care in the form of separate papers.

5.2.2.4 Facilitators and challenges of integrated primary oral health care

Our results on facilitators of and challenges to integrated care at the CBHSSJB are in consonance with previous research on oral health integration [178, 183, 198, 379-385]. These research studies included single center as well as multicenter studies and were conducted in the USA, Canada, Australia and the Netherlands. Oral health primary care and services were offered in community and diabetic clinics, an aged care facility, and a federally qualified health center, at various governmental and non-governmental organizations as well as in academic institutions [183, 198, 200, 379, 383-385]. According to our and these studies' findings [178, 183, 198, 379-385], the factors affecting integration of oral health into primary care can be classified into three main categories: organizational governance, collaborative practices, and public health strategies:

Organizational governance

Within organizational governance, vision and leadership [380, 382], supportive operational policies, and resource allocation [7, 8] at the macro level facilitated the integration of oral health into primary care. However, factors such as low political priority [200, 383], lack of integrative policies [198, 200, 383], high cost of integrated care [198, 381], lack of human resources [7, 8, 383], as well as lack of research evidence [381] were the major challenges of integration at the macro level.

Collaborative practices

Collaborative practices were related to teamwork, interprofessional care coordination, and referrals [178, 198, 382, 384]. Many studies reported shared medical-dental medical records [379, 380, 382], co-location or geographical proximity [7, 8, 178, 381, 382], and the presence of an oral health team champion [380] as enablers of organizational and professional integration at the meso level. However, the lack of interprofessional education and training [7, 8, 380, 383] and lack of practice guidance [381] were the major deterrents of oral health integration.

Public health strategies

Our findings indicate that the public health strategies mainly population-based preventive and promotive oral health interventions facilitated the oral health integration. These preventive and promotive strategies included health campaigns, role of health care workers and community

leaders in system integration and use of e-health technologies in functional integration. Similar results were seen in various studies conducted in the USA, Australia, Netherlands; for instance, the health promotion activities [379] such as multimedia health campaigns [381] and the presence of health care workforce such as community workers or dental hygienist in public health care settings [381]. Nurses, community workers, caregivers and leaders have acted as oral health champions to raise awareness and promote oral health [7, 200, 383]. Furthermore, e-oral health and teledentistry were identified to have a significant role in providing effective integrated oral health services [183].

5.3 Strengths and limitations

This research fills a recognized gap in the available literature on the role of integration of oral health into primary health care in Indigenous populations and provides new scientific evidence to advance the theoretical and practical knowledge in this field. This work also highlighted several potential avenues for future research, education and training, as well as policy planning. The recommendations derived from the results and validated with the key stakeholders can help to optimize integrated primary oral health care services. One of the strengths of this doctoral research is its participatory nature which was built on respectful partnership with the Cree community. Furthermore, its innovative approach in using appreciative inquiry for the first time in the field of Indigenous oral health research allowed us to recognize and value Indigenous vision in the organization of health care services and empowered the research and findings of the PhD project.

According to Baxter and Jack [249], a qualitative case study is a rigorous and flexible approach that offers exploration of a phenomenon through various data sources and variety of lenses to reveal multiple facets of the phenomenon. We used multiple case study to gain a deeper understanding of the integration of oral health into primary care through extensive data collection and to generate stronger and more reliable evidence on this integration compared to a single case study [218, 386]. The selection of four cases represents a reasonable number to achieve diversity among the key variables as well as the transferability of our findings. The triangulation of multiple sources of data, multiple methods, as well as multiple investigators provided more precise, comprehensive, and objective representation of the data, adding to the trustworthiness of the study

findings. Furthermore, the diversity of the study participants and inclusion of administrators, care providers, and end-users provided a robust understanding of the phenomenon under investigation and contributed to the uniqueness and richness of the data. This bolstered the applicability of these findings among the stakeholders of different health care organizations. Furthermore, the Standards for Reporting Qualitative Research (SRQR) guidelines [280] were followed to ensure an appropriate knowledge transfer approach.

However, this research project was subject to some limitations. The scoping review could not include publications in languages other than English and may have resulted in selection bias. Secondly, unlike systematic review, quality appraisal could not be performed due to the exploratory nature of this review that involved a variety of studies, including program descriptions. Furthermore, program descriptions in the review did not report explicit results and made it difficult to assess the impact of the program completely.

The qualitative nature of the case study does not support the generalizability of its findings. Moreover, incorporation of expertise and experience of the researcher is an integral part of case studies; yet, it might lead to tacit subjectivity [387]. Another limitation could be the nature of appreciative inquiry, which tends to focus on positive rather than negative aspects, since the participants may overlook problems within the organization being studied [388]. However, in this research project, we tried to overcome this issue by addressing the challenges and problems in a more implicit way throughout the appreciative inquiry phases. Furthermore, since the case study included only patients who were visiting dental clinics, we may not have included the perspectives of those who were not using dental services. Their perspectives are also important because as a whole system, integrated care focuses on public health and the needs of the entire populations in order to promote both population-based and person-centered care [389]. Also, comparison of the perspective on primary oral health care across stakeholders; patients, care providers and administrators, could have provided more depth of understanding. Though, following the holistic multiple case study design, our unit of analysis was community, and therefore, we did not aim to compare the perspective across stakeholders.

5.4 Conclusions and recommendations

This thesis provides empirical and scientific data on integration of oral health into primary health care in an Indigenous health care organization. The findings of the scoping review indicate that community-based and culturally appropriate integrated primary oral health care programs seem to be efficient and pertinent in improving oral health status and access to care of Indigenous communities. Our case study suggests that the CBHSSJB has efficiently integrated oral health within primary health care through strong leadership, culturally informed practices, community empowering, adequate management, coordination of services, and patient-centered primary health care services.

More empirical research and evaluation of integrated primary health care models is required to determine their effectiveness and to provide new data on sustainable outcomes of integrated oral health care. Therefore, in future, multicenter studies are needed to reinforce integrated primary oral health care. This will help to develop robust evidence-based practices and to generalize the implementation of such care across various healthcare systems. Furthermore, there is also need for exploring spiritual outcomes in assessing holistic oral health care in future research. Since the appreciative inquiry approach has not been commonly used in the field of dentistry, we recommend using this approach in research projects on oral health services, dental practice development, dental education, organizational change, as well as interprofessional collaboration.

Furthermore, it is necessary to develop standardized tools to measure the extent of integration and its performance. Governmental funding bodies should support this field of research in improving oral health and reducing oral health care disparities. Various community-based advocacy groups including health professionals' associations should take an active role in advocating for integrated dental care. The starting point could be to focus on target populations such as those who have special dental care needs and those who face disparity in access to dental care such as those living in rural, remote, and Indigenous communities.

Our results identified the shortage of permanent dentists and dental hygienists as a challenge for the relational continuity of care in this rural Indigenous health care setting. Therefore, in order

to increase the supply of dentists, policy makers should introduce enticing financial and non-financial incentive strategies to attract and promote permanent recruitment of health care professionals to rural and remote regions. Financial incentives can include provision of realistic and competitive remuneration, annual salary increments, and tax deductions, while non-financial incentives may include housing, transport, opportunities for health care professionals' spouse and children, and opportunities for career development. Local or Indigenous people can be custom trained to become professional health care providers. Furthermore, Indigenous and rural residency programs can be established and expanded.

The findings of this thesis also identified Indigenous vision and culturally sensitive care as facilitators of integration of primary oral health care. In this regard, a most important step is to integrate Indigenous cultural safety training into the professional health and allied health education system. Culturally appropriate care can also be offered by integrating education and training on Indigenous medicine and healing by the culturally knowledgeable and competent administration.

Furthermore, interprofessional education and training is necessary to promote integrated care. Integrated health care can also be promoted using e-health technology. E-health-based policy decisions and planning can include support for the development of digital-health-based legislation on safety and performance requirements, as well as infrastructure expansion in primary health care settings in rural and remote areas. The goal of improving oral health of disadvantaged populations can be achieved through innovative and collaborative research program taking into account the spatial and cultural determinants of oral health.

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APPENDICES

Appendix 1. Permissions

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Re: Requesting permission to reproduce Rainbow model of Integrated Care figure in the PhD thesis

Pim Valentijn <valentijn@essenburgh.nl>
Sat 2021-04-17 03:35
To: Richa - <richa.richa@umontreal.ca>

Dear Dr. Richa Shrivastava,

With the proper reference you can use the RMIC for your doctoral thesis.

Kind regards,
Pim Valentijn

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Op 17 apr. 2021, om 03:42 heeft Richa - <richa.richa@umontreal.ca> het volgende geschreven:

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Debbie Ayotte <Debbie.Ayotte@cma.ca>
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Thanks for emailing the CMA for permission to use the diagram/figure below from page 6 of this document:

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Ottawa: Canadian Nurses Association, Canadian Medical Association, Health Action Lobby, November 2013
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Sincerely,

Debbie

—

Debbie Ayotte
Associate Director, Policy Research & Support
Directrice associeé, Recherche et soutien aux politiques
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Appendix 2: Ethical approval certificates

Université de Montréal

Comité d'éthique de la recherche en santé

8 mai 2018

Objet: Certificat d'approbation éthique - 2ième renouvellement – « Integration of oral health care with primary care in rural and remote aboriginal communities »

Mme Elham Emami, M. Félix Girard, Mme Louise Potvin & Mme Marie-Pierre Bousquet,

Le Comité d'éthique de la recherche en santé (CERES) a étudié votre demande de renouvellement pour le projet de recherche susmentionné et a délivré le certificat d'éthique demandé suite à la satisfaction des exigences qui prévalent. Vous trouverez ci-joint une copie numérisée de votre certificat; copie également envoyée au Bureau Recherche-Développement-Valorisation.

Notez qu'il y apparaît une mention relative à un suivi annuel et que le certificat comporte une date de fin de validité. En effet, afin de répondre aux exigences éthiques en vigueur au Canada et à l'Université de Montréal, nous devons exercer un suivi annuel auprès des chercheurs et étudiants-chercheurs.

De manière à rendre ce processus le plus simple possible et afin d'en tirer pour tous le plus grand profit, nous avons élaboré un court questionnaire qui vous permettra à la fois de satisfaire aux exigences du suivi et de nous faire part de vos commentaires et de vos besoins en matière d'éthique en cours de recherche. Ce questionnaire de suivi devra être rempli annuellement jusqu'à la fin du projet et pourra nous être retourné par courriel. La validité de l'approbation éthique est conditionnelle à ce suivi. Sur réception du dernier rapport de suivi en fin de projet, votre dossier sera clos.

Il est entendu que cela ne modifie en rien l'obligation pour le chercheur, tel qu'indiqué sur le certificat d'éthique, de signaler au CERES tout incident grave dès qu'il survient ou de lui faire part de tout changement anticipé au protocole de recherche.

Nous vous prions d'agréer, Mesdames, Monsieur, l'expression de nos sentiments les meilleurs,

Guillaume Paré
Conseiller en éthique de la recherche.
Comité d'éthique de la recherche en santé (CERES)
Université de Montréal

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p.j. Certificat #15-130-CERES-P(2)

adresse postale
C.P. 6128, succ. Centre-ville
Montréal QC H3C 3J7

3333 Queen-Mary
2e étage, bur. 220-3
Montréal QC H3V 1A2

Téléphone : 514-343-6111 poste 2604
ceres@umontreal.ca
www.ceres.umontreal.ca

Université de Montréal

Comité d'éthique de la recherche en santé

CERTIFICAT D'APPROBATION ÉTHIQUE

- 2ième renouvellement -

Le Comité d'éthique de la recherche en santé (CERES), selon les procédures en vigueur et en vertu des documents relatifs au suivi qui lui a été fournis conclu qu'il respecte les règles d'éthique énoncées dans la Politique sur la recherche avec des êtres humains *de l'Université de Montréal*

Projet	
Titre du projet	**Integration of oral health care with primary care in rural and remote aboriginal communities**
Chercheurs requérants	**Elham Emami** Professeure agrégée, Faculté de médecine dentaire - Département de dentisterie de restauration **Marie-Pierre Bousquet** (ND), Professeure agrégée, Faculté des arts et sciences - Département d'anthropologie **Louise Potvin** Professeure titulaire, École de santé publique - Département de médecine sociale et préventive **Félix Girard** (ND), Professeur adjoint, Faculté de médecine dentaire - Département de santé buccale
Autres collaborateurs:	Yves Couturier & Christine Loignon (U.Sherbrooke), Christophe Bedos, Mary Ellen Macdonald, Anne Andermann & Susan Law (McGill), Aimée Brennan Dawson (U.Laval) & Jill Torrie (Cree Board of Health & Social Services)
Note :	Ajout du financement IRSC (30 mars 2016) Ajout du financement IRSPUM-RRSPQ-RRSBO (14 juil. 2016)
Financement	
Organisme	Réseau canadien de recherche en santé buccodentaire (RCRSB) // IRSC // IRSPUM-RRSPQ-RRSBO
Programme	Subvention
Titre de l'octroi si différent	-- // "Participatory Evaluation of Implementation and Performance in Quebec Cree Communities" // "Quebec Cree communities primary oral health care: A community-driven evaluation"
Numéro d'octroi	

MODALITÉS D'APPLICATION

Tout changement anticipé au protocole de recherche doit être communiqué au CERES qui en évaluera l'impact au chapitre de l'éthique. Toute interruption prématurée du projet ou tout incident grave doit être immédiatement signalé au CERES.

Selon les règles universitaires en vigueur, un suivi annuel est minimalement exigé pour maintenir la validité de la présente approbation éthique, et ce, jusqu'à la fin du projet. Le questionnaire de suivi est disponible sur la page web du CERES.

Guillaume Paré
Conseiller en éthique de la recherche.
Comité d'éthique de la recherche en santé
Université de Montréal

8 mai 2018	**1er juin 2019**
Date de délivrance du renouvellement ou de la réémission*	Date du prochain suivi
4 novembre 2015	**1er juin 2019**
Date du certificat initial	Date de fin de validité

*Le présent renouvellement est en continuité avec le précédent certificat

adresse postale
C.P. 6128, succ. Centre-ville
Montréal QC H3C 3J7

3333 Queen-Mary
2e étage, bur. 220-3
Montréal QC H3V 1A2

Téléphone : 514-343-6111 poste 2604
ceres@umontreal.ca
www.ceres.umontreal.ca

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Faculty of Medicine
3655 Promenade Sir William Osler #633
Montreal, QC H3G 1Y6

Faculté de médecine
3655, Promenade Sir William Osler #633
Montréal, QC H3G 1Y6

Fax/Télécopieur: (514) 398-3870
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CERTIFICATION OF ETHICAL ACCEPTABILITY FOR RESEARCH INVOLVING HUMAN SUBJECTS

The Faculty of Medicine Institutional Review Board (IRB) is a registered University IRB working under the published guidelines of the Tri-Council Policy Statement, in compliance with the Plan d'action ministériel en éthique de la recherche et en intégrité scientifique (MSSS, 1998), and the Food and Drugs Act (17 June 2001); and acts in accordance with the U.S. Code of Federal Regulations that govern research on human subjects. The IRB working procedures are consistent with internationally accepted principles of Good Clinical Practices.

At a Board meeting on 15 October 2018, the Faculty of Medicine Institutional Review Board, consisting of:

Patricia Dobkin, PhD	Joséane Chrétien, MJur
Athanasios Katsarkas, MD	Sally Mann. M.S.
Kathleen Montpetit, MSc	Roberta Palmour, PhD
Alexandra Pasca, LL.M.	Margaret Swaine, BA

Sylvia Villeneuve, PhD

Examined the research project **A10-B39-18A** titled: *Integration of oral health care with primary care in rural and remote aboriginal communities*

As proposed by: Dr. Elham Emami (Applicant) to _____ (Granting Agency, if any)

And consider the experimental procedures to be acceptable on ethical grounds for research involving human subjects.

15 October 2018
Date

Chair, IRB

Dean/Associate Dean Faculty

Institutional Review Board Assurance Number: FWA 00004545

Appendix 3: Interview guides

INTERVIEW PLAN

CARE PROVIDER

Date: ……..

Number of interview: …….

Time and place:

A) OPENING THE INTERVIEW

- Greet the applicant; introduce yourself (interviewer /position) and make the interviewee feel comfortable
- Explain the purpose of the interview, inform candidate of the duration of the interview allow interviewee to read
- Invite the interviewee to clarify any doubts regarding the interview, and sign the 2 copies of consent form (keep 1 copy)
- Describe the interview process
- Before starting mention to participant that:

  Your anonymity will be respected:

  “Your name will appear on no report, on no published document. If you quote names of persons during the interview, these names will not be revealed”
- Underline that: "even if there is nothing really very indiscreet in the discussion, you can refuse at any time to answer or still to end the interview "
- Install the tape recorder (make test of recording)

B) CONDUCTING THE INTERVIEW

- Begin with unstructured, open questions to encourage the spontaneity, then encircle gradually the subject (funnelling technique)
- Make brief syntheses at the end of sections to make sure that we understood well and to give the opportunity to individual to complete or to modify its statements (reformulation: " if I understood well what you say to me, you ….")
- It is possible that, spontaneously, individuals approach the themes of discussion on a different order which that describes in the following sections (for example in passing directly of the section 1 in the section 3): in that case, not to try to respect the order of sections, the important is to facilitate its spontaneity while making sure that we approach all the strategic themes.

SECTION 1: BACKGROUND

1. What is your current role among the team of professionals? And how many years have you had this position?
    a. Are you several sharing the same role? (Work overload?)
2. Since when are you working with the Cree?
3. With what age group?
4. Which clientele you are working with?
    a. What are the health and social needs of this clientele?
    b. What do you think of your clientele?
5. Do you feel a difference in your approach to patients, whether they are male or female?
    a. Do you feel that your patients act differently because you are a man / woman?

SECTION 2: CLINICAL INTEGRATION (PRESENT or ABSENT)

6. What is your definition of primary care?
7. Who do you think are the members of primary care?
8. Who do you think plays a role in primary **oral health** care?
9. What types of oral care can you offer as primary care? Are they well integrated in your workplace?
    a. Tell me a about a clinical situation where you feel that there has been integration of oral health into primary care.
    b. Tell me a about a clinical situation where you feel that there has been no integration of oral health into primary care.
10. Let's say that I am a patient who comes to see you for a reason X, how do you proceed to evaluate me? (Do you have any protocols)
11. Do you see a link between the oral health and overall health of your patients? If yes, which one?
12. What role do you play in patients' oral health? Direct or indirect?

13. Suppose I'm a patient with a toothache, what would you do with this information? What is your protocol/procedure?
14. When you consider the patient's care, do you include the cultural elements? How?
15. Have you had prior training tailored to the needs of the Cree people?
    a) If not: Do you think this kind of training would help you in your work?
    b) Do you have any suggestions?
16. When you identify an oral problem that you cannot handle what do you do? What is your approach in order to find a solution?

SECTION 3: THE NEED OF INTEGRATION

17. What resources are available in your organization in order to integrate oral health care in the primary care?
18. What do you think about the role of different members of primary care (nurses, doctors, dentists)? How do you think managers could play a role towards achieving integration?
19. How do you see the role of patients in the performance of integrated care?
    a. Does the patient have an active or passive role?
20. What do you think of communication and transmission of information between the various stakeholders in your workplace?
    a. How is the communication with patients you treat in your workplace?
21. Who should be involved?
    a. How can collaborators be involved?
    b. How could the collaborators communicate well/efficiently?
22. What do we need to change in the organization of the services to improve the integration of oral health into primary care?
    a. Adjust the clinical information system (ex. : files)
    b. Adjust clinical tools, assessment tools and service planning tools.
    c. Adjust the coordination methods such as case management or binding speaker
    d. Adjust the inter-professional and inter-sectorial protocols
23. Who should take the leadership position of an integrated intervention in oral health?

24. How do you think your work experience would be if dental services were integrated into primary care?

SECTION 4: ORGANIZATIONAL INTEGRATION

25. How can the organization help in better management of oral health?
26. What are the facilitators (organizational) with regard to integration of oral health in primary care?
27. What are the barriers (organizational) with regard to integration of oral health in primary care?
28. How can we evaluate if our health integration measures are efficient?

SECTION 5: NORMATIVE INTEGRATION

29. How do you feel about one single universal model of oral health care integration would address the needs in all kinds of community settings?
30. Are there some norms, practical guidelines, protocols about the integration of oral health into primary care? If yes, please describe them.
31. How can we develop norms, practical guidelines, protocols for other health care professionals to further achieve the integration of oral health care?

SECTION 6: IMPLEMENTATION

32. What kind of oral care would you wish be provided in primary care?
33. In which section: long-term care, schools…

SECTION: 7

34. Do you believe that the method of remuneration is an attractive factor for different professionals? Why?
    a. What do you think would be the best way to encourage the involvement of health professionals in Cree communities?
35. What do you think of the clinic where you work? Facilities? Infrastructure?

SECTION 8: APPRECIATIVE INQUIRY

36. Describe a high-point experience in your organization- Looking at your entire experience with this practice, remember a time that was most meaningful to you; when you felt most alive, most fulfilled and most excited and engaged?
    - What made it meaningful?
    - What did you like most about the experience?
    - Can you describe how you felt?
    - Can you give some examples?

37. Without being modest, what is it that you most value about yourself, your work, and your organization?
38. Can you tell me about a time when you believe another colleague excelled or stood out as a leader?
    - What was it that made this time stand out or memorable for you?
    - What were the leadership qualities that you admired in that individual?
    - What are the skills and attributes that you believe are the most valuable in the managing your work?

39. What are the core factors that give life to this organization, without which the organization would cease to exist? OR What do you experience as the core factors that give life to this organization?
40. What three wishes do you have to enhance the health and vitality of your organization?

C) CLOSING THE INTERVIEW

- Is there anything else which seems to you important and that you would like to talk about? any comment?
- Thank candidate for their time and contribution
- Ask if the participant can be contacted later if necessary

D) AFTER THE INTERVIEW

- Verify the tape recording
- Write down any observations made during the interview

INTERVIEW PLAN

PATIENT

Date: ……..

Number of interview: …….

Time and place:

A) OPENING THE INTERVIEW

- Greet the applicant; introduce yourself (interviewer/position) and make the interviewee feel comfortable
- Explain the purpose of the interview, inform candidate of the duration of the interview allow interviewee to read the instructions
- Invite the interviewee to clarify any doubts regarding the interview, and sign the 2 copies of consent form (keep 1 copy)
- Describe the interview process
- Before starting, remind the participant that his/her anonymity will be respected, and that his/her name will not appear on any written report. If any other names are mentioned during the interview, they will also be kept anonymous.
- Underline that: "even if there is nothing really very indiscreet in the discussion, you can refuse at any time to answer or still to end the interview "
- Install the tape recorder (make test of recording)

D) CONDUCTING THE INTERVIEW

- Begin with unstructured, open questions to encourage the spontaneity, then encircle gradually the subject (funnelling technique)
- Make brief syntheses at the end of sections to make sure that we understood well and to give the opportunity to individual to complete or to modify its statements (reformulation: " if I understood well what you say to me, you ….")
- It is possible that, spontaneously, individuals approach the themes of discussion on a different order which that describes in the following sections (for example in passing directly of the section 1 in the section 3): in that case, not to try to respect the order of sections, the important is to facilitate its spontaneity while making sure that we approach all the strategic themes.

SECTION 1: ACCESS TO CARE

1. ELIGIBILITY / AVAILABILITY Do you feel that the dental services offered in your community are good?

    a. Do they meet your needs?

    b. What are your needs?

2. ACCESSIBILITY What do you think about the accessibility of the dental clinic?

    a. Transport

    b. Infrastructure

3. AVAILABILITY Are there any dental services that you would want to access which are not always available in your community?

4. ACCOMMODATION What do you think of the dental clinic's schedule? The availability of appointments? Does it meet your needs?

    a. What do you think about the waiting time prior to getting an appointment?

5. Do you ever happen to go to the dentist:

    a. For emergencies? When you are in pain? For regular routine examinations and cleaning?

    b. AFFORDABILITY Does the fact that your dental care is paid for motivate you to visit the dental clinic?

SECTION 2: PATIENT CARE

6. When you consult for a dental problem, do you feel that the clinic staff is taking good care of you?

7. Can you discuss your general health problems with your dentist?

    a. Do you feel comfortable when doing this?

b. Do you feel that discussing your problems with the dentist helps you acquire the resources you need?

8. In the last year have you seen a doctor for a health problem?
    a. Do you believe that this health problem has an impact on your oral health?
9. Do you receive appropriate care for your health condition?

***(oral health AND general health)

SECTION 3 : CONTINUITY

10. Is there a follow up after your appointment at the dental clinic? Do they communicate with you after your appointment?

    a. To make new appointments?
    b. To confirm your appointments? (Reminder)

11. What would be the best way to contact you?
    a. E-mail, phone, Facebook?
12. Who should preferably contact you? A Cree employee or a non-Cree professional?

SECTION 4 : PATIENT-CENTERED CARE

13. Do the dental clinic staff~~s~~ understand your needs? Why?
    a. Do you always understand what the dentist tells you? Do you feel comfortable asking questions about your treatment?
14. Do you feel that your dentist respects your values and preferences?
    a. As for the choice of treatments?
    b. As for the proceedings of the sessions?
    c. As for his approach?
15. Do you feel that your dentist would have the same approach with an individual of the opposite gender?
    a. Do you feel a difference if your care provider is a man or a woman?

SECTION 5: APPRECIATIVE INQUIRY

16. What are the core factors that give life to this organization, without which the organization would cease to exist? OR What do you experience as the core factors that give life to this organization?
17. What three wishes do you have to enhance the health and vitality of this organization?

SECTION 5: CONCLUSION

CLOSING THE INTERVIEW

- Is there anything else which seems important to you and that you would like to discuss? Any comment?
- Thank candidate for their time and contribution
- Ask if the participant can be contacted later if necessary

AFTER THE INTERVIEW

- Verify the tape recording
- Write down any observations made during the interview

Appendix 4: Consent form

Université de Montréal

Conseil Cri de la santé et des services sociaux de la Baie James
Cree Board of Health and Social Services of James Bay

Information Sheet and Consent Form for Participants

Study title: Oral Health Integrated into Primary Care: Participatory Evaluation of Implementation and Performances in Quebec Cree Communities

Details about the study	
Source of funding:	Canadian Institutes of Health Research (CIHR), The Quebec Canadian Network of Oral Health and bone Research
Principal investigator	Elham Emami, DDS, MSc, PhD (Université de Montréal) Jill E Torrie, MA (Cree Board of Health And Social Services of James Bay) Yves Couturier, PhD (Université de Sherbrooke) Christine Loignon, MSc, PhD (Université de Sherbrooke) Louise Potvin, MA, PhD (Université de Montréal)
Other Researchers	Christophe P Bedos, DDS, PhD (McGill University) Marie-Pierre Bousquet, PhD (Université de Montréal) Aimée Dawson, DMD, MSc (Université Laval) Christopher Fletcher, PhD (Université Laval) Félix Girard, DMD, MSc (Université de Montréal) Susan K Law, MD, PhD (McGill University) Mary E Macdonald, PhD (McGill University) Vivian R Ramsden, RN, BSN, MS, PhD (University of Saskatchewan)
Collaborators:	Martin Chartier, DDS, MSc (Public Health Agency of Canada)

The Cree Board of Health and Social Services of James Bay, in collaboration with researchers from the Université de Montréal are conducting a study on the integration of oral health into primary care services. We invite you to be part of a study.
Please read the information below, which will help you decide if you want to be in the study or not. Feel free to ask questions at any time.

What is the study about?

The aim of this study is to explore together how dental services (prevention and treatment) are working within other care services to meet the vision of Cree Board of Health and Social Services of James Bay and to meet the needs of patients.

What will I be asked to do?

If you volunteer to participate in this study, we invite you to participate in individual interviews or focus group discussion with one of our researchers or a trained student. You can choose the time and place of the interview according to your convenience and agreement. The researcher will ask you questions related to your experiences and challenges of dental services and your views on the integration of oral health care and the front-line services. Interviews will take up to 60 minutes. No repetition of interviews is planned for the same person.
All discussions will be recorded with a tape recorder, because it is impossible for the researcher to write everything down during the interview. Discussions contained on the audiotape will then be typed, and the audiotape will be destroyed.

What are the benefits of being in this study?

You will not withdraw any personal benefit by the means of your participation in this study. However, the results obtained could contribute to the advancement of knowledge in this field. Moreover, your participation could help health professional organizations develop effective policies that will facilitate the integration of oral health into primary care services. This study could thus have positive repercussions in the field of access to health services and on oral health in general.

What are the risks of being in this study?

You will not be put in any particular risk by participating in these interviews as they simply consist of discussing with a researcher. We guarantee you the utmost confidentiality throughout this study. You have the right to withdraw from the study at any time. Furthermore, if any of the questions make you uncomfortable you also have the right not to answer them. In any case, there is no consequence if you withdraw from the study or if you refuse to answer a question.

How will we protect your privacy?

Only information necessary for the research study will be collected. This information will remain confidential. To protect your identity, your name and identifying information will be replaced with a code (numbers and or letters); the link between the code and your identity will be held by the research team at Université de Montréal. No information that discloses your identity will be allowed to leave the institution.

Your study information will be kept for 7 years after completion of the study by the research team.
When the study is finished, we will report what we have found out to the Cree Health Board and the people from Eeyou Istchee. Later, we also hope to publish the findings, and present them at scientific meetings. The Cree Health Board will always see these papers first, before we make them public. People will not be able to tell what your own answers were.

It's your choice.

You are free to choose whether or not you want to be in this study. What you decide will not affect your health care or anything else.
If you decide to be in the study, we will ask you to sign a consent form. But you can still change your mind later with no consequences:

- You can withdraw from the study at any time. If you do, we will destroy any questionnaires you already filled out. We will send you a letter to confirm that we have done so.
- If you withdraw after we have finished the study and published the results, it will be too late to remove your information from the report. But we will make sure it does not get used for any future reports.

Is any compensation planned for your expenses and inconveniences?

There is no financial compensation planned for participating in this study.

For further information
If you have questions or concerns about the scientific aspect of this study or if you want to withdraw from the study, please contact the principal researcher:

Dre Elham Emami
Elham.emami@umontreal.ca
(514) 343-6053

If you have questions or concerns about the ethical aspect of this study, please contact the research ethics advisor

ceres@umontreal.ca
(514) 343-6111 ext 2604

For more information about your legal rights as a participant in the study, you can refer to the Université de Montréal website:

http://recherche.umontreal.ca/participants

For complaints or questions about your legal rights in this study, please contact:

Louise Valiquette
Interim Commissioner of complaints and quality of services
Cree Board of Health and Social Services of James Bay
515, boul. Décarie, St-Laurent (Québec) H4L 3L1
Phone toll free 1-866-923-2624
r18.complaints@ssss.gouv.qc.ca

OR

The ombudsman of the Université de Montréal
Tel : (514) 343-2100 *collect calls are accepted from 9 a.m. to 5 p.m.
Email : ombudsman@umontreal.ca.

Consent Form: Oral Health Integrated into Primary Care: Participatory Evaluation of Implementation and Performances in Quebec Cree Communities

By signing this document, you acknowledge that:

- You have read this form in its entirety;
- You understand the information given in this form and the possible implications;
- You have had the opportunity to ask questions and you are satisfied with the answers provided by the researcher;
- You understand the risks and benefits associated with this study;
- You understand that your participation is **entirely voluntary** and that you may refuse to participate or withdraw at any time without reason, and that no consequences are associated with a refusal or withdrawal;
- You have received a signed copy of this consent form to keep in your records.

I have read this form and understand the risks and benefits of the study. I know that participation is voluntary, and that I can withdraw at any time.

I agree to take part in this study and to participate to interviews_____.

Please answer the following question:

I. When available, findings from this study will be presented to the communities. For educational purposes, the Cree Board of Health and Social Services of James Bay (CBHSSJB) may be interested in contacting participants from this study for interviews, use of quotes, etc. Would you consent to being contacted by the CBHSSJB or members of the research team to: *(Check answer)*

		Yes	**No**
a.	Solicit your participation for radio and/or television interviews?	☐	☐
b.	Have your picture taken for print or web publication?	☐	☐
c.	Use some coded answers for print publication?	☐	☐
d.	Use some coded answers for the CBHSSJB website?	☐	☐

☐ **No**, someone **may not** contact me to ask me if I would be interested in participating in some of the public-education activities offered by the Cree Health Board.

_____	_____	
Name of Participant (Please print)	Signature	Date
_____	_____	
Name of Witness (Please print)	Signature	Date

By signing this consent form, I declare that:

- I have explained the major implications of this study;
- I have answered every question to the best of my ability;
- I have explained that participation is voluntary and that the individual may refuse to participate or withdraw from the study at any time;
- I have given a signed copy of the consent form to the participant.

_____	_____	
Name of person who obtained consent (print)	Signature	Date

Appendix 5: Permission from Cree Board of Health and Social Services of James Bay to submit the thesis

CONSEIL CRI DE LA SANTÉ ET DES SERVICES SOCIAUX DE LA BAIE JAMES
CREE BOARD OF HEALTH AND SOCIAL SERVICES OF JAMES BAY

Mistissini, September 22, 2021

SENT BY EMAIL

Dr Richa Shrivasatava
Email Address: *richa.richa@umontreal.ca*

Object: Letter of Approval to Request of Thesis's submission
Our reference: (22)_2016-05
Name of Thesis: Appreciative Inquiry in Evaluating the Integrated Primary Oral Health Services in Quebec Cree Communities

Dear Dr Shrivasatava,

Whit this letter, we are pleased to confirm the approval for submission of your thesis.

Thank you for taking into consideration the comments of Dr Lucie Papineau (Head of Dentistry) and Dr René Larouche (Dentist-advisor) from the CBHSSJB.

Please, let us know the outcome of your submission.

Meegwetch and we wish you a good day.

Sincerely,

Sylvie St-Pierre
Research Administrator
sylvie.st-pierre18@ssss.gouv.qc.ca

cc: RC-RAP members
Dr Lucie Papineau
Dr René Larouche

RC-RAP Letter of Approval to Request of Thesis's submission (22)_2016-05
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