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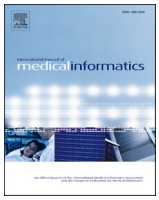

Review article

Digital health technology for Indigenous older adults: A scoping review

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ABSTRACT

Background: Telehealth implementation is a great solution for Indigenous older adults (OAs) due to the rise of chronic disease and other age-related health disorders. Telehealth is a promising option to increase quality of life, decrease healthcare costs, and offer more independent living.
Objectives: This scoping review investigated existing telehealth solutions that have been implemented to serve Indigenous OAs.
Methods: A structured search strategy was performed on 6 electronic databases: Ovid Medline, Ovid PsycINFO, Ovid Embase, EBSCOhost, Scopus and Cochrane. Studies were included in the review if they contained information on telehealth technologies for Indigenous OAs (aged 65 years and older). Grey literature was also explored in ProQuest Theses and Dissertations, ERIC, Google Advanced and various government websites from Canada, Australia/New Zealand and the USA.
Results: Twenty six articles were included and reviewed by two assessors. Analysis of the results from five countries revealed eight different types of telehealth solutions for Indigenous OAs. No documented telerehabilitation technologies were available to OAs in Indigenous Communities. Analysis of a broad range of Indigenous OAs with different chronic diseases revealed that they are seeking telehealth technologies for ease of access to health care, increased health equity and cost-effectiveness. Results revealed various advantages of telehealth for Indigenous OAs and barriers for implementing such technologies in Indigenous communities.
Conclusion: The use of telehealth technologies among OAs is expected to rise, but effective implementation will be successful only if the patient's acceptance and culture are kept at the forefront, and if healthcare services are provided by telehealth-trained healthcare professionals.

1. Introduction

Healthcare is problematic in rural and remote communities on Indigenous reserves, especially among vulnerable populations, including persons with disabilities [1], children [2] and older adults (OAs) [3]. Despite improvements in life expectancy and advances in medical therapies [4–8], these populations are faced with increasing inequalities in access to healthcare [9–12], specifically in the OA population [9,13,14]. In fact, as compared to urban and suburban residents, health care in the OA population may be poorest in rural communities due to the increased need for access to prescriptions [3,15], transportation solutions for OAs in isolated communities [3,15–19], inadequate access to care [3,15], limited access to specialists and specialized resources [3,16–19], poor infrastructure and coordination of services [15], lack of resources in the ambulatory setting [20], scarce assisted living [15] and in-home care for frail OAs [15], and barriers related to culture [15,21], language [15,21], and socioeconomics [3, 15–19]. Telehealth has grown rapidly to meet the healthcare needs of remote and distant communities. Telehealth is a term used to describe the use of telecommunication devices that allow geographically separated individuals to exchange health information synchronously or asynchronously between them [22,23]. Literature concerning telehealth solutions for OAs has developed significantly over the past several years [24]. It is reported that greater use of technology is associated with

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higher levels of social connectedness, and improved health and general quality of life [25,26]. Education is also a key factor in improving health literacy, the use of technology and adaptation to new technologies in the future, and the ability to search health information on the internet [27]. The adoption of telehealth is increasing, but many OAs including Indigenous individuals remain isolated from digital life.

Many barriers to the use of technology in OAs have been identified, including computer and tablet usage, as well as internet and e-mail [28–31]. Although there is a variety of telehealth technologies available to the chronically ill population, not all of these technologies may be used by OAs. In addition to chronic disease symptoms, OAs may experience alterations in vision, hearing, and dexterity, which may hinder their use of various telehealth devices [32,33]. They are more likely to require healthcare, specialized rehabilitation and palliative services as they continue to age, and telehealth can help increase access to these specialized services for this population [34]. Research has demonstrated telehealth services may be able to replace in-person visits and have been useful among OAs resulting in improved quality of life, health outcomes, and patient satisfaction [34–36]. This technology may therefore benefit OAs living in remote or rural communities. In fact, OAs living in rural or remote or Indigenous communities can often be located at a great distance from healthcare centers providing specialized services, making access to these centers more difficult for OAs within these communities. As a means of minimising this geographical barrier for OAs living within these communities, the implementation of telehealth services for OAs living in rural and remote communities has been suggested [34], and this may be especially relevant for Indigenous OAs. Telehealth services may be an effective way to increase access to healthcare within Indigenous communities by improving well-being and clinical outcomes and decreasing the need for Indigenous OAs to travel for specialized services [37]. However, to date, the development of telehealth technologies has seldom considered the important and unique cultural factors of Indigenous populations, as cultural appropriateness is one element influencing acceptance of use [37, 38].

Previous studies have established that telehealth enabled specialist consultations to be conducted in the safe environment, while improving affordability and convenience [39,40] and reducing the stress of healthcare, emphasizing the presence of an Indigenous health worker as a facilitator of culturally appropriate healthcare [37,41–43]. Literature clearly mentions a need for more in-depth research as the challenges associated with implementing telehealth in Indigenous communities are not unique to Indigenous settings, but are more pronounced as a result of cultural, political and jurisdictional issues [44,45]. Therefore, the aim of this study is to provide a clear state of the art regarding telehealth technologies that target Indigenous OAs living in Indigenous communities, and to identify emerging trends and future solutions to support this populace. In particular, this study aims to explore i. the existing telehealth solutions that have been implemented to serve Indigenous OAs and how have they evolved over time and for what healthcare need, ii. the approaches to implementing and evaluating telehealth solutions for OAs in Indigenous communities and iii. the barriers, facilitators and opportunities for implementing telehealth solutions for OAs in Indigenous communities.

2. Methods

2.1. Design

Literature corresponding to the topic of telehealth for Indigenous OAs is emerging and disparate; therefore, a scoping review was performed with the aim of gathering published literature with a broad range of study designs and grey literature without exclusions on the basis of country or year of publication [46,47].

2.2. Search strategy

A medical librarian searched the following databases: Ovid Medline, Ovid PsycINFO, Ovid Embase, EBSCOhost (including Ageline and CINAHL Full Text), Scopus and Cochrane Library. The initial search was constructed in Ovid Medline (Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily) in May 2020 and then translated to the other databases. The Ovid Medline search strategy is shown in Appendix A. The search was constructed with a mix of keywords and controlled vocabulary unique to each database. The librarian utilized a modified version of the search filter to retrieve studies related to Indigenous Peoples of Canada from the University of Alberta [48] in order to focus on the Indigenous component of the search and to reduce the appearance of studies related to non-Indigenous people. Additional keywords and subject headings to include Indigenous groups from Australia, New Zealand and the United States were added to the search strategy in order to retrieve resources from outside Canada in regions that include Indigenous communities. Search terms for telehealth included the following terms: *"telemedicine", "telerehabilitation", "remote consultation", "telepresence", "telesurveillance", "teleassistance", "telehealth", "ehealth", "mhealth", "telehomecare", "digital health", "e-coaching", "geriatric technology", "assistive technology", "smart home", "video conference", "telemonitoring", "home monitoring" and "virtual monitoring"*. Appendix A shows the exhaustive list of terms, subject headings, or combination of terms used to define the concept "telehealth". Authors also searched for grey literature in ProQuest Theses and Dissertations, ERIC, Google Advanced and various government websites from Canada, Australia/New Zealand and the USA as these countries involves explicit usage of Indigenous policies an planning models. All references were uploaded into EndNote (version X8, Clarivate Analytics, Philadelphia, Pennsylvania, USA) and duplicates were removed.

2.3. Inclusion and exclusion criteria

To be included, manuscripts had to be written in English or French and present information on telehealth for Indigenous OAs. The manuscripts had to include topics related to telehealth, telemedicine, telerehabilitation or remote consultation that are provided for Indigenous OAs living in Indigenous communities. Search results reporting outcomes exclusively related to young Indigenous people (<65 years) were excluded, as well as those related to non-Indigenous people. Two independent reviewers performed the search and study selection. To be included, a manuscript had to be judged relevant by both reviewers. If consensus could not be reached, a third reviewer was consulted. Manuscripts of various formats were included: journal articles, abstracts, MSc/PhD theses and project reports.

3. Results

3.1. Study selection

Literature search identified a total of 674 manuscripts. Twenty six manuscripts fully met the inclusion criteria and were included in the review (Fig. 1).

3.2. Publication date, place of publication and publication channel

All manuscripts were published in the last two decades, between 2002 and 2019, with a zero to three manuscripts per year. Manuscripts were published in five countries, with most published in the United States (38.5 %, n = 10) and Australia (34.6 %, n = 9) followed by Canada and New Zealand (n = 3) and Taiwan (n = 1).

Regarding the publication channel, 84 % of the manuscripts were peer-reviewed journal articles (n = 22), 8 % were conference abstracts (n = 2), and 8 % were grey literature (reports related to a government

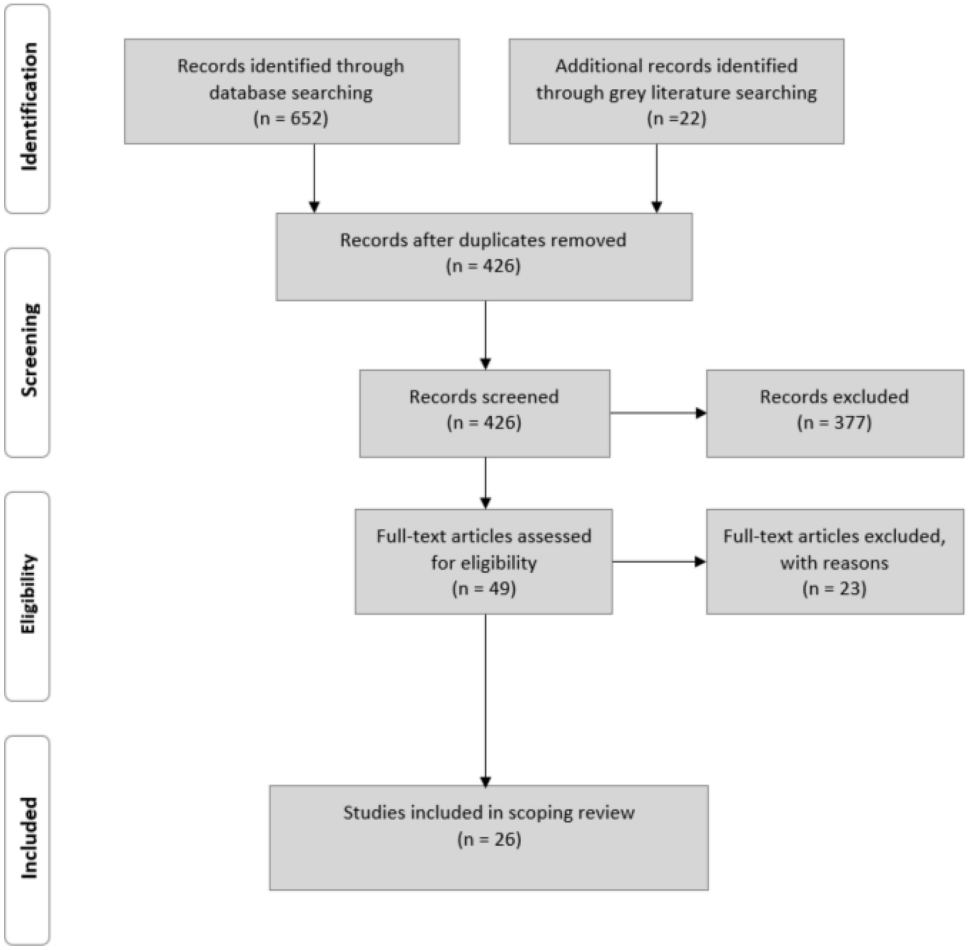

Fig. 1. Article selection process [49].

program report) (n = 2).

3.3. Study designs

Out of 26 manuscripts included in this study, 18 studies were descriptive. Four studies were interventional in design, including three randomized controlled trials, and one manuscript following the Kaupapa Maori Research (KMR) methodology. Since KMR, or literally 'a Māori way', is the least known among the methodologies retrieved in this review. A description of its characteristics as listed by Walker et al. (2006) [50] is provided below:

- KMR gives full recognition to Maori cultural values and systems,
- KMR is a strategic position that challenges dominant Pakeha (non-Maori) constructions of research,
- KMR determines the assumptions, values, key ideas, and priorities of research,
- KMR ensures that Maori maintain conceptual, methodological, and interpretive control over research, and
- KMR is a philosophy that guides Maori research and ensures that Maori protocol will be followed during research processes.

In addition to aforementioned study designs, the remaining manuscripts were three program evaluations and one proposal.

3.4. Telehealth solutions

Eight different telehealth solutions were identified and classified into four types as described and detailed in Table 1:

3.5. Clinical focus

The literature on telehealth for Indigenous OAs targeted a broad range of physical conditions (cardiology, oncology, diabetes, and ophthalmology) as well as mental and cognitive diseases, with a focus on remote evaluation and therapy. Telehealth also covered healthy lifestyles and patient engagement. Fig. 2 shows a classification of telehealth interventions targeting Indigenous OAs by intervention type and targeted disease/health concern. Qualitative analysis of the retrieved outcomes revealed the following themes:

3.6. Needs for telehealth solutions for Indigenous OAs

Three needs-related themes emerged from the thematic analysis of the included articles. "Access", "health equity" and "cost". Ten studies unanimously reported that telehealth technologies allow for improved access to healthcare for populations that might otherwise not have access [39,40,42,43,51–60]. Six studies clearly mentioned increased telehealth-related health inequity as represented by an increasing number of initial visits and more diagnoses in complex diabetes [52,53] and mental health [39,40,55,60]. Seven studies, including an economic evaluation paper [39,40,55,60], unanimously concluded that telehealth solutions allow for cost savings by minimising the need to travel and decreasing the burden on budgets of central clinics [39,40,55,60–63].

3.7. Outcomes of telehealth for Indigenous OAs

Of the total twenty six included manuscripts, fifteen studies reported improvements in clinical outcomes, namely psychiatric assessment,

Table 1
Telehealth solutions targeting Indigenous OAs.

Telehealth type	Telehealth solution	Brief description	References
Teleconsultation A way of connecting patients to physicians and nurses with three different modalities: virtually (teleconferencing), in-situ (mobile telehealth clinic), and led by the therapist located in a hub/city (telephone).	**Videoconference (VC)**	VC is established between a conference room (the hub) usually in the healthcare centre and the remote care setting (s) (the spokes). VC might be for new referrals, reviews, monitoring of treatment or routine follow-up 'visits'.	[39,40,42,43,51–60]
	Mobile telemedicine clinic	An approach of bringing care to a remote care setting. Via electronic communication, a therapist in the hub can review the findings and supervise the mobile clinic staff.	[61–63]
	Telephone	The referral from primary to secondary and to tertiary level is important to overcome the barrier of accessibility to advanced care. A national health service including 3-month service, including 4 telephone calls, mailed support material with tailored support and advice from a facilitator about the recommended quality and quantity of physical activity and food.	[64]
Health screening A group of medical screening platforms that record and transmit the information to the tertiary care centre for review by a therapist. Therapist recommendations are then relayed back to the remote site using the same platforms	**Remote screening equipment**	Telemedicine screening service for tele-ophthalmology [65,66] and teleradiology [65,67]. Image data sets are transmitted to local server and then uploaded to a workstation by the interpreting therapist.	[66,67]
	Portable device attached to patient's Smartphone	A small device (clips onto the back of most smartphones); can be used by anyone with minimal training; and records a single-lead electrocardiogram in ~30 s.	[68]
	Home monitoring unit and "store and forward"	Involves the recording of clinical data and "storing" the data on a server or device, which later transmits ("forwards") the information to a tertiary care centre for review by a physician or nurse practitioner. Physician recommendations are then relayed back to the remote site using the same technology.	[59]
Medical data processing and storage Allows to collect, store and integrate medical data to be used at client consultation.	**telemedicine devices**	Telehealth/ telemedicine integrator installed in community health centers (including an electronic client register, recall and reminder systems). The computer system maintained a database of all consented trail participants and their preventive services.	
	Information system	Information systems are designed to be used in 'real time' at client consultation, in order to serve as an effective reminder system in the delivery of health services according to specified guidelines.	[69,70]
Telehealth promotion Based on smartphone applications and web-based platforms that promote healthy lifestyles involving culturally relevant information	**Application** (Smartphone and web-based platform)	Smartphone apps provide health coaching, provision of evidence-based educational resources, goal tracking and peer support. Apps contained culturally relevant information, such as about activity groups specifically for a given community, promotion of wellbeing through spiritual concepts, customs, blessings, culturally relevant recipes, proverbs, and culturally tailored motivational messages. In Ni Mhurchu et al. (2019) [71], cultural icons are used as virtual rewards when participants achieved their goals.	[71,72]

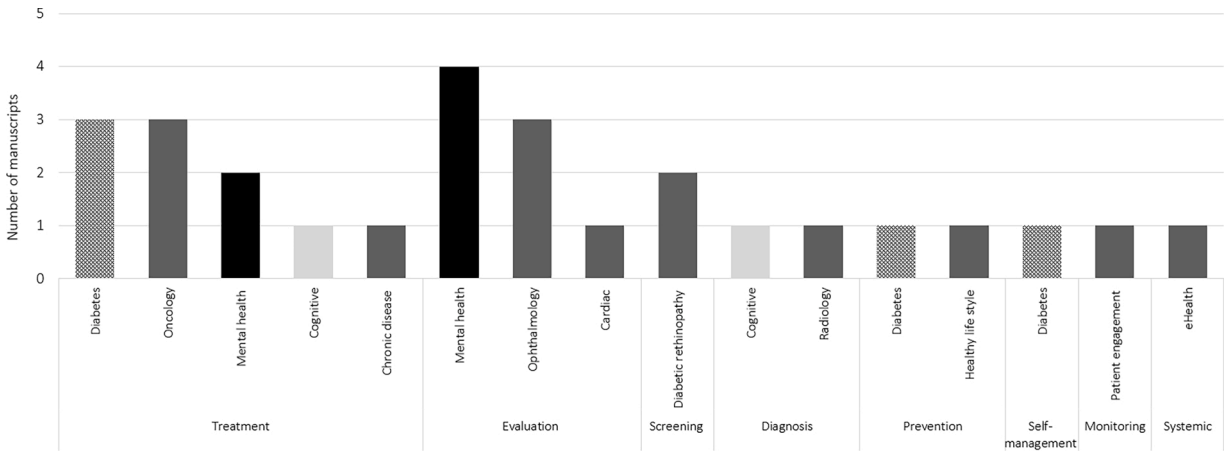

Fig. 2. Type of intervention per disease/health condition.

treatment and mental health services [39,40,51,55,60], diabetes diagnosis [65,66], diabetes treatment [64] and support of the self-care [72], colorectal cancer diagnosis [67], blindness prevention [61], chronic disease management [59], self-reported smoking rate [52,53], and general improvements in service delivery [69]. In terms of adherence to healthcare, two studies reported that telehealth solutions are effective in achieving improved adherence to diabetes self-care [52,53], while another study reported that a mobile health program did not improve adherence to health-related behaviour guidelines [71].

3.8. Acceptance of telehealth by Indigenous OAs

Usability of telehealth solutions has been reported in twelve studies in terms of satisfaction, perceived usefulness and acceptance. Seven studies reported patients' [39,40,42,43,55,60,62] and families' and healthcare providers' [42,43] satisfaction with telehealth technologies. Four studies reported a high level of perceived usefulness [54,56,58] and one study reported acceptance by patients and families conditional to respect of Indigenous culture [51].

4. Opportunities for development

Thematic analysis of the included articles allowed to identify barriers, facilitators and gaps in terms of telehealth development for Indigenous OAs. Four studies reported three barriers to implementing telehealth solutions for Indigenous OAs in Indigenous communities, namely acceptance by Indigenous OAs [68], culture [51] and healthcare providers' professional skills [42,43]. Five studies clearly mentioned that telehealth facilitates communication and medical information sharing, and constitutes a platform for research [40,42,54,60,67]. Five studies reported several opportunities for development; namely, the institutionalization of relevant work practices and enhanced health centre capacity [69], including technologist training, referring physician education, careful attention to image transmission, and clearly defined methods of communication with patients and referring providers [67], designating Indigenous health organizations as lead agencies and integrating telehealth as part of the publicly-funded healthcare system [70]. In terms of research, there is an opportunity for conducting research based on the initial benchmark report of diabetic retinopathy and diabetic macular edema [57,58].

5. Discussion

The aim of this study is to provide a clear portrait of telehealth technologies that target Indigenous OAs living in Indigenous communities, and to identify future directions for developing telehealth to support Indigenous OAs in their communities. The literature of telehealth for Indigenous OAs emerged only in the last two decades (2002–2019), totaling only twenty six manuscripts published at a frequency of ~1.5 manuscripts per year. Most of the literature is published in the USA (38.5 %) and Australia (34.6 %). While terms used to refer to Indigenous people were specific to Canada, USA, Australia and New Zealand, the search was not limited by countries. A few references emerged from different countries due to the variability of the term 'Indigenous' and only one article was included from a fifth country [Taiwan, [61]]. Overall, there is clearly a need for more research, in particular in Canada and New Zealand where many Indigenous communities could benefit from telehealth as many Indigenous OAs choose to live on their native lands. For example, 48 % of Indigenous OAs living in Canada live in rural communities [73].

Regarding the nature of literature, most of the manuscripts were peer-reviewed journal articles (n = 22) and the study designs were disparate. Most of the studies were descriptive (69.2 %). Only one article included an Indigenous methodology, namely the Kaupapa Maori Research also known as 'a Māori way'. Lack of scientific and grey literature, and dispersion of the search design suggested a major gap in addressing and reporting the health needs of Indigenous OAs living in Indigenous communities. The possibilities for developing improved telehealth solutions are significant. In terms of conducting research, there is a still need for portraying initial benchmarks in the micro, meso and macro levels to initiate or continue research work [e.g., [57, 58]].

At the micro level, more design and validation studies are needed to support the use of telehealth technologies by clinicians, family members or Indigenous OAs. At the meso level, most of the needs are situated around the increasing local healthcare capacity [69], namely clinician and technologist education and training in both the hub ('urban centre') and the spokes (remote location), and institutionalization of relevant work practice in terms of digital information transfer and digital communication with patients and referring providers [67]. Literature mentioned that telehealth is a viable vehicle that facilitates communication and data sharing, and constitutes a platform that can be deployed for research purposes [44,45,55,56]. At the macro level, designating Indigenous health organizations as lead agencies and integrating telehealth as part of the publicly-funded healthcare system was reported as a strategy for enabling better health outcomes in Indigenous communities [70]. Despite already high levels of acceptance and satisfaction with telehealth technology among Indigenous OAs, their families and the healthcare providers [39,40,42,43,55,60,62], and high levels of perceived usefulness, this strategy would increase the quality of implementation of telehealth solutions as a result of the solution being considered by members of the community. As such, we would observe greater acceptance of telehealth support by Indigenous OAs [68], a better fit to each community culture [51], and improved care as provided by clinicians with more adapted professional skills [42,43].

Interestingly, Weiner et al. (2011) reported acceptance of telehealth technology by patients and families conditional to respect of Indigenous culture [51]. In terms of clinical focus, the literature on telehealth for Indigenous OAs targeted a broad range of physical, mental and cognitive diseases, as well as healthy lifestyle promotion and patient engagement. 15/26 studies reported improvements in clinical outcomes [39,40,51–53,55,59–67,72] and general improvements in service delivery [69].

Surprisingly, although there is a need for rehabilitation (e.g., [74,75]) and telerehabilitation [76] services among Indigenous communities living in rural and underserved areas, our scoping review showed that there is no literature about telerehabilitation technologies for OAs in Indigenous communities at all. Telerehabilitation is an emerging field that covers different areas of medicine [77]. It has been defined by Zampolini et al. (2008) as "a subfield of telemedicine consisting of a system to control rehabilitation at distance" [78]. Absence of literature on telerehabilitation for Indigenous OAs inspires new ideas for initiating telerehabilitation systems for Indigenous communities following one of the solutions currently used in teleconsultation between physicians, nurses and patients; namely, virtual conferencing, mobile telehealth clinic, or led by the therapist following a hub-and-spoke organization design. The latter has been identified as an avenue that offers great potential for serving patients efficiently and effectively if they are deployed correctly [79]. Overall, from health perspective, the need for telehealth in Indigenous communities would not be different from the non-Indigenous population. The difference is in the way communication is established to counter the geographical distance and the clinical infrastructure, which is identified as a fundamental barrier along with cultural context [37,44]. Telehealth was unanimously reported as a facilitator for access to care in populations that might otherwise not have access [39,40,42,43,52,53,55,60,62,63], an efficient cost saving approach [39,40,55,60–63] and an enabler of health equity [39,40,52,53,55,60].

5.1. Strengths and limitations to this review

This scoping review has considered multiple contexts (i.e., Canada, USA, Australia, and New Zealand), however, the healthcare needs of Indigenous peoples in different countries may be different based on history, geographical location of Indigenous communities in these countries, which could limit the portraying of telehealth in Indigenous communities. Also, findings have been drawn from literature on Indigenous OAs, therefore this review cannot highlight any differences in the ways teleheatlh is used within Indigenous OAs and younger populations

5.2. Conclusion

This review revealed that there are several factors that can either facilitate or serve as barriers to telehealth implementation for OAs living in Indigenous communities. Moreover, this review shows lack of implementation of telehealth for Indigenous OAs, and the need for researchers to fill the gap of knowledge regarding the development of enhanced telehealth-friendly healthcare centers with advanced technologies and trained medical personnel.

5.3. Recommendations for further research

Current research on telehealth for Indigenous populations should be continued and reported more extensively for better awareness and evidence-based sensitization. More review of evidence is required, as research is growing and should be addressed as an iterative process rather than a one-time activity. Future studies need to elaborate more on how specifically health-related Indigenous OAs' needs differ from the needs of non-Indigenous population and how this could influence the way telehealth is developed and implemented. Linkages between cultural context (first barrier) and technology are absent on the literature. As a future direction for the second barrier, namely communication, additional preventative approaches are needed within Indigenous communities, such as screening and monitoring plans, and several experiences with non-Indigenous populations could be replicated with Indigenous OAs with adaptation to the needs of this populace.

Authors contribution

Dr. Mohamed-Amine Choukou has initiated the study and built the concepts around the search strategy in collaboration with Caroline Monnin, Health Sciences Librarian at the Neil John Maclean Health Sciences Library. Dr. Choukou, Dr. Ali Maddahi and Anna Polyvyana have run the screening, data extraction and materials preparation. Dr. Choukou has initiated a first draft of the manuscript. All the authors contributed to the final version of the manuscript.

Declaration of Competing Interest

The authors report no declarations of interest.

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Appendix A

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily <1946 to May 06, 2020>

Search Strategy:

1 telemedicine/ or telerehabilitation/ or remote consultation/ (26167)
2 ((tele or remote or virtual) adj1 (medicine or rehab* or consultation* or health or monitor* or assist* or presence* or robot or monitor* or surveillance* or homecare or care or caring or home-care)).tw,kw. (4560)
3 (telemedicine* or telerehab* or teleconsulation* or telehealth or ehealth or mhealth or mobile-health or telemonitor* or teleassist* or telepresence* or telesurveillance* or telehomecare or digital-health or e-coach or ecoach or gero?tech* or geriatric-tech* or smart-home or assistive-technolog* or home-monitor*).tw,kw. (31362)
4 Technology/ or Smartphone/ or self-help devices/ or videoconference/ or (iphone or smart-phone* or smartphone* or internet or video-conferenc* or videoconferenc*).tw,kw. or (assistive adj3 (device* or technolog* or "self-help")).tw,kf. (83510)
5 or/1-4 (119337)
6 exp Indians, North American/ or exp Inuits/ or exp Health Services, Indigenous/ or exp Ethnopharmacology/ or Alaska Natives/ or Athapaskan.mp. or Saulteaux.mp. or Wakashan.mp. or Cree.mp. or Dene.mp. or Inuit.mp. or Inuk.mp. or Inuvialuit*.mp. or Haida.mp. or Ktunaxa.mp. or Tsimshian.mp. or Gitsxan.mp. or Nisga'a.mp. or Haisla.mp. or Heiltsuk.mp. or Oweenkeno.mp. or Kwakwaka'wakw.mp. or Nuu chah nulth.mp. or Tsilhqot'in.mp. or Dakelh.mp. or Wet'suwet'en.mp. or Sekani.mp. or Dunne-za.mp. or Dene.mp. or Tahltan.mp. or Kaska.mp. or Tagish.mp. or Tutchone.mp. or Nuxalk.mp. or Salish.mp. or Stl'atlimc.mp. or Nlaka'pamux.mp. or Okanagan.mp. or Sec wepmc.mp. or Tlingit.mp. or Anishinaabe.mp. or Blackfoot.mp. or Nakoda.mp. or Tasttine.mp. or Tsuu T'inia.mp. or Gwich'in.mp. or Han.mp. or Tagish.mp. or Tutchone.mp. or Algonquin.mp. or Nipissing.mp. or Ojibwa.mp. or Potawatomi.mp. or Innu.mp. or Maliseet.mp. or Mi'kmaq.mp. or Micmac.mp. or Passamaquoddy.mp. or Haudenosaunee.mp. or Cayuga.mp. or Mohawk.mp. or Oneida.mp. or Onodaga.mp. or Seneca.mp. or Tuscarora.mp. or Wyandot.mp. or Aboriginal*.mp. or Indigenous*.mp. or Metis.mp. or red-road.mp. or on-reserve.mp. or off-reserve.mp. or First Nation.mp. or First Nations.mp. or Amerindian.mp. or (urban adj3 (Indian* or Native* or Aboriginal*)).mp. or Navajo.mp. or Cherokee.mp. or

Sioux.mp. or apache.mp. or Iroquois.mp. or Lakota.mp. or osage.mp. or modoc.mp. or ethnomedicine.mp. or residential school*.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. or Oceanic Ancestry Group/ or (aborigin* or torres-strait* or maori*).mp. (99765)

7 exp Geriatrics/ or Aged/ or Health Services for the Aged/ or Senior Centers/ or (elders or elderly or geriatric* or old-age or (seniors not "high school") or older adult* or centenarian* or nonagenarian* or octogenarian* or septuagenarian* or sexagenarian* or dottering or decrepit or tottering or overaged or "oldest old").mp. (3181832)

8 5 and 6 and 7 (112)

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