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Partial-Load Professor, Program Advisor and Simulation Specialist, Humber College and Michener/UHN, Toronto, Ontario

> *As a nurse, we have the opportunity to heal the heart, mind, soul and body of our patients, their families and ourselves. They may not remember your name but they will never forget the way you made them feel.*
>
> *—Maya Angelou*

I have been a member of CCCN since 2001. Provincially in Ontario, I have been the Provincial Director, Professional Education Chair, Instructor for the Cardiovascular Certification Exam and presenter for online webinars and national conference presentations. Nationally, I have been the president elect, co-author of the CCCN National competencies, and co-contributor to the CNA Cardiovascular Certification exam. My career has been divided equally between clinical practice and education. I have been in nursing in Ontario for over 30 years.

In my role as president of CCCN, I chair the Board of Directors and, in partnership with an association management firm work to achieve CCCNs strategic plan/imperatives. I want to give back to my profession for the innumerous opportunities I have been given during my career. In giving back, I hope to contribute to the future of cardiovascular nursing. For my presidency, I challenge all nurses to *be the difference in cardiovascular nursing in Canada.*

Past President: Susan Morris, RN BN MEd CNCC(C) CCN(C)

Clinical Nurse Educator, New Brunswick Heart Centre, Saint John, New Brunswick

> *Everyone can learn, just not in the same way, or on the same day.*
>
> *—Malcolm Knowles*

I have been a CCCN Member since 1986 and a member of the CCCN Board of Directors since 2006. I am also a Canadian ACLS Nursing liaison for Heart & Stroke Foundation and American Heart Association. I believe that professionalism in nursing can be enhanced through membership in CCCN. Therefore, my professional dream would be to have all nurses practising in the field of cardiovascular nursing become members of CCCN.

As a nurse entering the field in 1984, I knew I loved the "heart" and I had a fascination with resuscitation science; so cardiovascular nursing was a natural fit. I graduated with a diploma in nursing, but soon realized nurses need a commitment to life-long learning and graduated with a baccalaureate degree some years later, then went on to pursue a master's degree in education. I have certificates in critical care nursing and adult education along with CNA certification in critical care and cardiovascular care. My area of research interest is Targeted Temperature Management and Post Cardiac Arrest Syndrome. I have the pleasure of being the Canadian representative at the American Heart Association and act as a liaison for Advanced Cardiac Life Support. In addition to a fulfilling professional life, I have a wonderful husband of 35 years, two beautiful daughters (both of whom are nurses) and three beautiful grandchildren. I feel very fortunate in life and given the opportunity I would not change a thing (other than my weight!). I love my career as a registered nurse and clinical nurse educator. CCCN has played a large part in shaping my career and I can't stress enough that membership has its benefits.

Secretary/Treasurer: Paula Gaynes, RN, BN, CCN(C)

Staff Nurse Critical Coronary Care & Cardiac Stepdown Units, Horizon Health Network, Saint John Regional Hospital, Saint John, New Brunswick

> *I'm not telling you it's going to be easy, I'm telling you it's going to be worth it.*
>
> *—Art Williams*

I have been an actively contributing member of CCCN since 2009; acting as Provincial Director for the NB/PEI region (2011-2014) and currently serving as Secretary/Treasurer for the CCCN National Board since 2014.

I graduated from the Saint John School of Nursing in 1996 and I have been employed in Critical Care Units in Corpus Christi, Texas (1998–1999), and in Saint John, NB (1999-present). Married for over 20 years, with two teenaged daughters, I work full-time and have successfully completed a Critical Care Course (2007), earned my Cardiovascular Nursing Certification (2008), and obtained my Bachelor of nursing degree from the University of New Brunswick (2011).

I welcome every opportunity to learn something new and am always willing to share my knowledge with others. I am the proud recipient of the Lynne Childs Award for Clinical Excellence (2015) and feel this is a positive reflection of my nursing career to date. As a full-time bedside/floor nurse, I feel that I offer a hands-on and realistic (sometimes gritty) opinion to our CCCN discussions. I want to be a positive and contributing voice that engages in the conversation and discussion of cardiovascular nursing issues and I look forward to continuing to be a positive advocate for all CV nursing.

Director – Provincial Divisions: Christina (Chris) Kuttnig, RN, BN, CCN(C)

Continuing Education Instructor, Cardiac Sciences Program, St. Boniface Hospital, Winnipeg, Manitoba

Be the change that you want to see in the world.

—M. Gandhi

I first became a member of CCCN when, as a new cardiology educator in 2007, the local chapter provincial director approached me to join the CCCN MB planning committee for Keeping Current with Cardiovascular Care. She was an inspiration as she was a strong advocate for cardiovascular nursing and kept CCCN MB alive through tough times. In 2009, that same mentor encouraged me to become the secretary-treasurer for the local chapter. I became the provincial director for Manitoba in 2011 and have been to the present time. During that time I was involved in many teleconferences across the country with other provincial directors and joined the National CCCN board as Director of Provincial Directors, and was a member of the financial and awards committee in 2015.

I have had the fortune of working with amazing cardiovascular nurses who have allowed me opportunities to work on clinical projects and presentations. These projects or presentations were shared locally at the Keeping Current with Cardiovascular Care, as well as nationally through CCCN at the fall conference Canadian Cardiovascular Congress or spring conference Updating Your Cardiovascular Toolkit.

My role with CCCN has allowed me opportunities to share ideas, challenges and network about practice issues and innovative care with colleagues locally, provincially and nationally. I find that when I network or work with other nursing leaders in cardiovascular nursing I am re-energized to continue to strive for excellence, learn more, share more and encourage others to do the same. We are the voice in Canada for cardiovascular nursing and our strength in numbers can affect change in the health of Canadians.

National Research Director: Sheila O'Keefe-McCarthy, RN, BScN, MN, PhD, CNCC(C)

Assistant Professor, Brock University, Faculty of Applied Health Sciences; Department of Nursing, St. Catharines, Ontario; Adjunct Assistant Professor, Trent University, School of Nursing, Peterborough, Ontario; Critical Care Registered Nurse, Ross Memorial Hospital-Intensive Care, Lindsay, Ontario

If you find it in your heart to care for somebody else, you will have succeeded.

—Maya Angelou

I have had the pleasure of being involved with CCCN since 2007 in various capacities such as: Chair of the National CCCN Research Executive; Member-Ontario Executive Division-Ontario Provincial Research Chair; Senior Mentor-CCCN Mentorship Program; Moderator-CCCN Scientific Sessions, Abstract Reviewer; and Committee Member-Local Conference Planning Committee.

Through service on the CCCN Board I hope to a) increase visibility of CV nursing in Canada in terms of promoting patient-focused clinical research in women's and men's cardiovascular health, b) provide educational opportunities for patients and healthcare providers, and c) extend reach to create awareness, and promote knowledge mobilization of CV clinical and research projects within this scientific community.

Director of Professional Education: Clare Puzey, BN, RN, ACCN, CCN(C)

Clinical Nurse Educator Cardiac Catheterization Lab/ STEMI Program & Short Stay Cardiology Unit, Alberta Health Services – Foothills Medical Centre, Calgary, Alberta

Live as if you were to die tomorrow. Learn as if you were to live forever.

—Mahatma Gandhi

I have more than 25 years of experience in the critical care environment including cardiac ICU/CVICU/trauma ICU/pediatrics/emergency and as a flight nurse with STARS Air Ambulance. Cardiac nursing is relevant in all areas of practice, so I have been very fortunate to have always had this foundational background. Currently, I am the Clinical Nurse Educator for the Cardiac Catheterization Lab/Short Stay Cardiology unit at the Foothills Medical

Centre and am actively involved with Provincial STEMI and ACS Initiatives. I also continue to work in the emergency department.

My real passion is teaching and advocating for all members of the healthcare team. Over the past three years I have developed a platform for all cardiac educators across Canada to network, share knowledge, and pool resources and best practice guidelines. I am also an instructor for numerous cardiac specialty courses and workshops; as well as Advanced Cardiac Life Support (ACLS), Trauma Nursing Core Courses (TNCC), and the Adult Critical Care Nursing Certificate Program (ACCN).

In Spring of 2017, I assumed the role of Director of Professional Education for the CCCN National Board. This portfolio is instrumental in ensuring all cardiac nurses have the tools, knowledge, practice guidelines and standards necessary to work throughout the cardiac health environment. I feel it is so valuable to have a national voice that provides direction and support to all of our nurses working in the cardiovascular specialty.

Words of wisdom: the nursing profession provides all of us with the amazing ability to work anywhere and in any environment. Never stop learning!

Director of Membership and Communication: Laura Runcie BN, RN, MSN, CCN(C)

Cardiac Services Registered Nurse, New Brunswick Heart Centre (NBHC) Saint John Regional Hospital, Saint John, New Brunswick

> *There are three ways to ultimate success: The first way is to be kind. The second way is to be kind. The third way is to be kind.*
>
> —*Fred Rogers*

I joined CCCN in 2014, six months after graduating, in pursuit of camaraderie and knowledge. I sought to surround myself by intelligent and passionate nurses. The more involved with CCCN I became, the more role models I met and the more fervent of CV nursing I became.

For the first three years of my nursing career I worked in CCU and cardiac stepdown at the NBHC. During this time I was an active member of CCCN, acted as the NB secretary from 2015–2016, presented at a CCCN spring conference and became a certified CV nurse. In 2016 my family moved to BC, where I worked in the cath lab, and then CCU. To remain active with CCCN, I volunteered to operate its social media pages in 2017. This volunteer position evolved into my current director role in 2018. Since then, the CCCN social media presence has grown, now including Facebook, Twitter and LinkedIn. In this role, and in conjuncture with my Master's degree, I have also worked to improve and update the education and health promotion section of the CCCN website. In mid 2018 my family relocated back East where I returned to the NBHC's CCU. Although I have not been a nurse for long, I am a zealot for continued education, having attended many provincial and national cardiac conferences. Though currently on maternity leave, I am still very involved with and excited about everything CCCN has to offer, thus making it my goal to get the word out!

Director of Publications: Jo-Ann V. Sawatzky, RN, PhD

Professor, University of Manitoba, Winnipeg, Manitoba
Editor, Canadian Journal of Cardiovascular Nursing

> *Eventually all things fall into place. Until then, laugh at the confusion, live for the moments, and know everything happens for a reason.*
>
> —*Albert Schweitzer*

I was appointed to the role of Director of Publications for CCCN and Editor, *Canadian Journal of Cardiovascular Nursing* (CJCN) in April 2019. I have been a member of CCCN since 2001, the Provincial Research Director for Manitoba since 2008, and an Associate Editor for the CJCN since 2012. I am also a past recipient of the CCCN Cardiovascular Nursing Research Excellence Award. In addition to frequently publishing with colleagues in peer-reviewed journals, including the CJCN, I have been a peer reviewer for numerous journals and have mentored and collaborated with many graduate students in writing for publication.

My many years of clinical practice in critical care and cardiovascular nursing were foundational to my pursuit of a career in academia and my passion for research in the cardiovascular health and illness trajectory and women's cardiovascular health, in particular. I continue to be actively involved in women and heart health initiatives, locally, provincially, and nationally. Most recently, I was invited to be a member of the Canadian Women's Heart Health Alliance and the Alliance's Advocacy Working Group, which strives to improve women's cardiovascular health across the lifespan.

As the Director of Publications and the CJCN Editor, I am committed to promoting the mission and goals of the CJCN—to foster the exchange of knowledge that is relevant to all areas of cardiovascular nursing and, in turn, to deepen our understanding of the clinical needs of our patients and their families.

CCCN Staff

David Miriguay – Executive Director

David, CAE, has 20 years of experience in the not-for-profit and charities sector and has worked as Executive Director for three national organizations.

His areas of expertise include finance, administration, education, and event management, as well as governance, policy, marketing and program development. David has successfully developed, implemented and managed a number of major events and sponsorship programs for national associations.

Kathryn Boire – Administrator

Kathryn, PAdm, has been involved in managing associations for 17 years, specializing in conference and tradeshow planning.

Kathryn has strong organizational and problem-solving skills and works effectively with volunteers and suppliers to produce successful events both large and small. Kathryn manages one of the largest events in Canada for the association sector—the annual Tête-à-Tête tradeshow.

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Do you know a nurse who deserves recognition for her/his accomplishments in and contribution to the field of Cardiovascular Nursing? A nurse who demonstrates excellence in her/his practice?

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For more information on how to nominate a deserving colleague please **click here** or visit our website at **www.cccn.ca** under the Awards tab.

Women are under-researched, under-diagnosed, and over-dying

—Heart & Stroke Foundation, 2019

The Canadian Journal of Cardiovascular Nursing announces a Call for Papers for a Theme Issue: *Women's Heart Health Across the Lifespan*

The Canadian Journal of Cardiovascular Nursing (CJCN) is pleased to announce the call for papers for a special theme issue on women and heart health for the 2020 spring issue. We invite researchers, clinicians, and educators to submit short reports* of novel research projects or initiatives related to women's heart health across the lifespan. The publication of this special issue will align with the 3rd Canadian Women's Heart Health Summit in Ottawa in April 2020. Please direct queries to Dr. Jo-Ann Sawatzky, CJCN Editor at **joanne.sawatzky@umanitoba.ca**

Deadline for submissions extended to January 15, 2020.

*criteria: max 12 double-spaced pages [excluding title page]; Please follow general CJCN Author Guidelines for research/non-research submissions: **https://www.cccn.ca/media.php?mid=1278**.

Dysrhythmia Competency and Education: A Regional Education Program Development Project to Improve Nursing Knowledge and Patient Safety

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Abstract

Cardiac rhythm interpretation and management are key skills required by nurses to practise safely in a monitored care environment. However, the Fraser Health (FH) region in British Columbia (BC) reportedly has considerable variation in the skill levels of nurses to identify and manage dysrhythmias. Differences in content and scope, as well as employer requirements for cardiac rhythm training programs contribute to this variation. The purpose of this educational program development project was to assess the status and need for dysrhythmia training in nurses within FH, and then to develop, implement, and evaluate a program for dysrhythmia competency and education. The goal of this regional program was to set a minimum standard of knowledge required for safe nursing cardiac monitoring practice. Initial outcomes suggest healthy participation rates. Implications for nursing practice include the potential for more accurate and timely identification of cardiac dysrhythmias, which in turn may improve patient care and safety outcomes.

Key words: dysrhythmia education; cardiac rhythm competency; regional implementation

Koning, C., Slade, J., Smith, K., & Di Lella, D. (2019). Dysrhythmia Competency and Education: A Regional Education Program Development Project to Improve Nursing Knowledge and Patient Safety. *Canadian Journal of Cardiovascular Nursing*, *29*(3), 7–15.

Clinical Highlights

- Dysrhythmia education and training has resulted in high variability in knowledge and skill in nurses monitoring cardiac patients in Fraser Health and British Columbia.
- There is the potential to improve the knowledge, skill, and confidence of RNs working in cardiac monitored areas by providing online dysrhythmia competency testing and education.
- A standardized dysrhythmia program for a region may facilitate the goal of all nurses working with cardiac monitored patients having the ability to provide a similar standard of care for cardiac monitored patients.

Introduction

Cardiac monitoring competency is important for two key reasons; nursing clinical practice outcomes and patient care outcomes. This proficiency in cardiac monitoring is important for quality care provision and patient safety, and also has a positive effect on healthcare outcomes and clinical practice (Burnett, Goldberg, DeMaria, Levine, & Katz, 2019; Mashikian, 2019; Rodriguez Muñoz et al., 2016; Webster et al., 2016; Zègre-Hemsey, Garvey, & Carey, 2016).

First, nursing clinical practice competency in cardiac monitoring allows for improved nursing confidence and early identification and treatment of life-threatening cardiac rhythms (Burnett et al., 2019; Gilligan, et al., 2005; Throndson, Davis, Gohn, Walton, & Bergner, 2012; Zègre-Hemsey et al., 2016). Numerous studies support the benefit of equipping nurses with dysrhythmia identification and management skills as a way to improve patient care outcomes (Burnett et al., 2019; Dane, Russel-Lindgren, Parish, Durham, & Brown, 2000; Funk et al., 2017; Kapurkar, Sandhya, & Babar, 2017; Little, Ho, & Scott, 2001; McGrath & Sampson, 2018; Sanders et al., 1994; Webster et al., 2018; Zègre-Hemsey et al., 2016). Several of these authors also discuss the importance of incorporating cardiac monitoring training early in nurses' careers to help manage life-threatening events in practice and optimize patient care (Little et al., 2001; Webster et al., 2018; Zègre-Hemsey et al., 2016). In addition, nurses benefit greatly from the knowledge development needed to effectively care for cardiac patients and gain confidence with practice (Funk et al., 2017; Mashikian, 2019). Of interest is that practising and simulating critical events in healthcare have been found to be essential for knowledge retention (Burnett et al., 2019);

others highlight the importance of structure in the educational materials, for instance, a formal program outline, goal setting, and testing (Kapurkar et al., 2017).

The second reason for high-level dysrhythmia competency is to improve patient outcomes (Begg, Willan, Tyndall, Pepper, & Tayebjee, 2016; Burnett et al., 2019; Dane et al., 2000; Shah & Rubin, 2007; Webster et al., 2018). It is, therefore, essential that nurses recognize and interpret rhythms correctly, so they can provide rapid interventions when necessary, and avoid critical life-threatening events that have the potential to result in patient mortality (Burnett et al., 2019; Dane et al., 2000; Rodriguez Muñoz et al., 2016)

From the above literature, it is clear that there are benefits to patient care and nursing clinical practice when nurses can recognize and correctly manage life-threatening cardiac arrhythmias.

Aim

The aim of the education program development project was to plan, develop, implement, and evaluate a regional dysrhythmia education and competency program for nurses within FH. The goal of the dysrhythmia program was to set a minimum standard throughout the region for all nurses working in cardiac monitored areas to assess their knowledge and skill level, as a way of improving patient safety.

Context

FH is a regional health authority in BC, Canada, which includes 12 acute care hospitals with a service area capturing a growing population of 1.8 million. FH is the largest health authority region by population in BC, with more than 200 cardiac monitored beds in the acute care hospitals, and many more outside of cardiac units. Competency in the cardiac monitoring of patients at these sites is a required skill to ensure patient safety in many cardiac units at FH (Fraser Health, 2015). However, FH does not specify where or how this competency should be obtained, nor do they routinely test or evaluate this skill set. This lack of evaluative processes can result in gaps in knowledge and an increased potential for adverse events (McGrath & Sampson, 2018), including the: misinterpretation of cardiac rhythms and the consequential delivery of inappropriate interventions (Bae et al., 2012; Shah & Rubin, 2007), undetected myocardial infarctions (Begg et al., 2016), and even death (Birnbaum et al., 1994; Funk et al., 2017).

Needs Assessment

To evaluate these gaps in knowledge, the FH cardiac clinical nurse specialist (CNS), with the help of the cardiac educators at each of the sites, assessed the current state of cardiac monitoring competency training of nurses in the region. The purpose of this assessment was to evaluate the current level of cardiac rhythm education and assess for variation within the region. The catalyst for this assessment was a report of an event at one site where a life-threatening cardiac rhythm was not identified, which had the potential to result in a catastrophic event. The needs assessment was conducted via email correspondence with 10 of FH's largest acute care site's cardiac educators. Questions included: how many cardiac monitored beds they have, what the units' requirements were for cardiac rhythm training prior to hire, was there any unit-based rhythm education provided for the staff, was there any competency test conducted on a regular basis, and what were the perceived barriers to cardiac rhythm education in FH. While conducting this assessment, we found the lack of recognition and confidence in rhythm identification was not isolated to the site where this adverse event was reported. Similar events of poor rhythm recognition were reported at several sites in FH. These adverse events in cardiac monitoring are hard to track, as they are rarely entered into the Patient Safety Learning System (PSLS) event-reporting database and are usually only revealed in informal conversation.

The needs assessment revealed that the level and skill set associated with telemetry training varies substantially within

Table 1. Dysrhythmia Training and Education Surveillance Scan and Needs Assessment of FH Sites

Facility	# of Non-critical monitored beds	Dysrhythmia training/ education
Royal Columbian	61	High acuity training BCIT* & ACLS*
Abbotsford	24 (in CCU)	High acuity training BCIT* & ACLS*
Eagle Ridge	9	High acuity training BCIT*
Surrey Memorial	16	BCIT 7150 or Michener ECG course pre-hire
Burnaby	21	Prefer BCIT dysrhythmia course pre-hire, but can be from another institution & ACLS*
Chilliwack General	8	Intensive care (ICU)/Coronary Care Unit (CCU) monitor cardiac rhythms on medical unit where medical nurses are untrained in cardiac rhythms
Peach Arch	4	Any telemetry course pre-hire required for 4 telemetry beds located outside of critical care
Langley	6 (in CCU)	Critical care trained nurses. Telemetry beds located in CCU only
Ridge Meadows	10	CCU/ICU nurses monitor cardiac rhythms on surgical floors where surgical nurses have no dysrhythmia training
Delta	4	BCIT* funded telemetry training for 4 telemetry beds in medical unit.

**Note: BCIT = British Columbia Institute of Technology; ACLS = Advanced Cardiac Life Support*

FH (Table 1). For example, nurses in the telemetry units at Royal Columbian Hospital are trained in advanced cardiac life support (ACLS) and High Acuity Specialty from British Columbia Institute of Technology (BCIT). This education combination includes cardiac rhythm identification, dysrhythmia management, and competency testing every two years for ACLS. Royal Columbian Hospital is the second largest hospital in FH, the Heart Centre, and has the highest acuity patients in the region. As such, a high level of dysrhythmia training is necessary and expected. Other urban acute care settings, including Surrey Memorial and Abbotsford Hospitals, the largest and third largest hospital in the region respectively, have the same combination of ACLS and high acuity specialty training for their Coronary Care Unit (CCU) nurses. However, the telemetry unit nurses at Surrey Memorial Hospital are required to complete a dysrhythmia course prior to hire. The provider of the dysrhythmia course is not specified in the job description, which has resulted in varying regional levels of competencies.

At the more rural sites like Ridge Meadows Hospital, a smaller semi-rural hospital, critical care area nurses attend the critical care training through BCIT, which includes dysrhythmia training. However, in addition to monitoring their critical care patients, the critical care nurses also remotely monitor telemetry patients in the hospital's surgical unit. The nurses working on the surgical unit providing direct care to these cardiac patients do not require dysrhythmia or cardiac training. This model of care is mirrored at Chilliwack Hospital, with the critical care areas providing remote monitoring support to other cardiac or medical areas in the hospital. Fraser Canyon Hospital, a small rural hospital east of Vancouver, has implemented a small cardiac monitoring area within their emergency department. Nurses working in this setting do not have clear guidelines if dysrhythmia training or prior experience with cardiac monitoring is required for this area. Other similarly smaller sized facilities in FH (less than 150 beds) support the completion of an online-accredited telemetry course to work in a cardiac monitored area, such as those offered by SkillStat, BCIT, and Michener Institute.

In summary, there was great variation found in the cardiac monitoring training and skills required in FH. No in-house developed training was provided by FH. Many sites reported that the monitored patients were located in medical or surgical areas, but these patients' cardiac rhythms were monitored remotely in the intensive care unit (ICU) or CCU areas. Nurses working on these medical and surgical floors were not required to have dysrhythmia training. Based on the conversations with clinical nurse educators at the various sites, many felt this was a safety concern.

To assess how FH compared with other facilities in British Columbia regarding cardiac rhythm education and training standards, a provincial assessment was conducted with the help of a convenience sample of provincial cardiac educators at three sites in different health authorities. These results are presented in Table 2.

In conversation with these three health authorities in BC, we determined that there are no known standardized competency tests currently available in BC to assess the dysrhythmia knowledge of RNs practising in cardiac monitored areas. Furthermore, there are concerns within the province that individuals who have completed telemetry training do not retain the knowledge if it is not regularly practised in clinical situations (K. Redman, personal communication, October 29, 2018; T. Oye, personal communication, October 26, 2018; K. Shipley, personal communication, October 28, 2018). These findings of lack of knowledge retention are consistent with the published

Table 2. Sample of Provincial Dysrhythmia Training and Education for Employment in Monitored Units

Facility	ECG course	Method	Cost	Issues
Kelowna General	Provide in house training to ICU nurses: ECCO; Basic ECG Interpretation course; New cardiac unit hires require any telemetry course prior to starting work; BCIT or Skill Stat preferred	ECCO is a six-hour online course moderated by an educator	Program sponsored. ECCO=$140 for individual or organization can purchase a site license for 1-3 years for the specific course	Lack of knowledge retention if too long since course completion. Renewals/refreshers not required
Vancouver General	Require telemetry course prior to hire, BCIT preferred; In-house instructor-led basic ECG refresher offered during orientation	Educator-led refresher; Prefer telemetry training prior to start	In-house: program-sponsored	Nurses with prior ECG training have varied retention: can identify a rhythm, but unsure of how to intervene
St. Paul's Hospital	Three-day course offered a few times a year. RNs with experience take a challenge exam; if passed, they are not required to take the course	Educator-led; Annual refresher of approx. 30 rhythms; Prefer telemetry training prior to hire	In-house: program-sponsored	Lack of knowledge retention

**Note: ECCO = Essentials of Critical Care Orientation; BCIT = British Columbia Institute of Technology* literature (Allen, Currey, & Considine, 2013; Duncan & Wright, 2014; Funk et al., 2017), and support the importance of annual competency review to ensure nurses' knowledge retention and retrieval of information.

The details of the most commonly taken dysrhythmia courses are listed in Table 3. As of July 2019, no course offers annual competency reviews. The annual review is important, as it encourages nurses to take steps to ensure they are competent prior to the review. Sustainability of knowledge is a key factor in being able to utilize that knowledge in a critical situation, which is high-risk but low-frequency, especially in an environment with less acuity and at smaller hospitals with lower rates of cardiac dysrhythmia monitoring (Funk et al., 2017; Kapurkar et al., 2017; McGrath & Sampson, 2018). Unfortunately, however, nurses are often required to pay for these courses prior to hire, which is a barrier to enrollment.

Program Development

During the needs assessment we focused on cardiac specific areas. However, areas outside of the cardiology units also expressed the need for additional cardiac monitoring training. These areas included overflow emergency monitored areas, post-operative recovery areas, oncology, endoscopy, and mental health providers who monitored electroconvulsive therapy patients. Thus, it became clear that any education or competency program that was developed would need to be relevant and applicable to all nurses caring for patients on cardiac monitors, regardless of the setting. Of interest is that when consulting end users in the development of this program, there were some clinical areas that 'opted out' of participating in the regional dysrhythmia program. These more intensive care areas, like critical care and emergency departments, felt their RNs had sufficient skills to practise safely in cardiac monitoring and management because of their in-house training programs for nurses working in these areas. Nevertheless, the current situation within FH necessitated standardization in order to ensure safe, measurable, competent care at all hospital sites and all units with cardiac-monitored patients within the same health authority. To ensure effective uptake, the program needed to be nurse driven and accessible, with the goal to improve patient safety. While the need for standardized dysrhythmia education and competency was evident, a practical and sustainable strategy for implementation was less clear.

A performance framework, based on the W.K. Kellogg Foundation logic model development guide (W.K. Kellogg Foundation, 1998), was designed by the FH cardiac CNS, with the intent to illustrate the FH system priorities, possible outputs within a future regional dysrhythmia competency and education program, and the expected outcomes (see Figure 1). This performance framework takes the form of a logic model and was used as a guide to visualize the potential impacts at a health systems level.

To begin, we reviewed the system priorities of FH and the cardiac services leadership team goals for alignment and support of this education project. The FH cardiac leadership team endorsed the input priorities of the performance framework. The efficient and affordable use of resources was essential to ensure success and support of the program. The program needed to be innovative in providing a solution to the identified problems, while simultaneously being appropriate and applicable to end users. To address these key points, a working group consisting of experts in cardiac knowledge and education was formed to develop the program. This team, including FH cardiac educators and the FH cardiac CNS, created the regional dysrhythmia education program. While the program was designed primarily for cardiac leaders, cardiac educators, and nurses working in cardiac monitored areas, anyone can access and use the modules to improve their knowledge and skills. The program was divided into four components or steps: 1) the clinical protocol, 2) the dysrhythmia competency test, 3) the dysrhythmia education module, and 4) the practical application guidelines. The intention of the program was three-fold: 1) to improve health outcomes, 2) to improve health system and performance, and

Table 3. Summary of Current and Commonly Used Dysrhythmia Training and Education Options for Nurses in BC

Program	Duration	Method	Cost*	Competency
SkillStat Six second ECG essentials or mastery course	Essentials course: 1 day Mastery course 3 days	Instructor	Essentials (8 hrs): $275; Mastery (20 hrs): $675	No exam or certification on completion; no annual competency
Michener Institute 12-lead ECG interpretation EK816-YY1	Continuous enrolment for one-year max. Can contract an instructor for in class teaching	Online	$219	No annual competency
BCIT* NSCC* 7150 dysrhythmia interpretation and management	12-week ECG course Can contract an instructor to teach a refresher course	Online: 12 weeks Classroom: 4 days	Online: $554.19 Classroom: $583.03	No annual competency

**Note: Current as of July 8, 2019; BCIT = British Columbia Institute of Technology; NSCC = Nursing Specialty Critical Care*

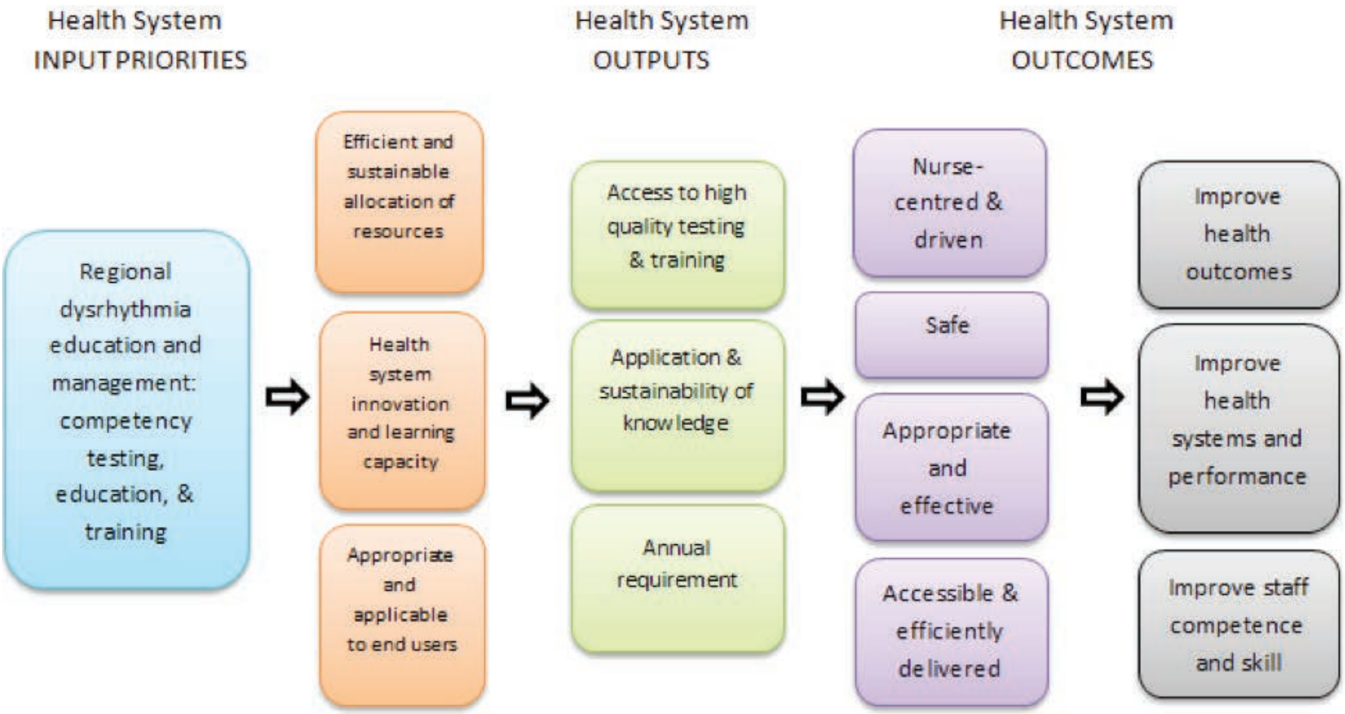

Figure 1. FH Dysrhythmia Performance Measure Framework Logic Model

3) to improve nursing skills and competence.

First, the working group developed a clinical protocol to act as a roadmap for anyone in FH accessing the course, and for educators to facilitate implementation and adherence to the proposed annual requirements. The clinical protocol included the identification of the core users of the program and a systematic approach to guide the educator or instructor in the use of the program tools. Second, the working group created a bank of two competency tests, with 40 and 50 questions respectively, and requiring a pass rate of 80%. If the learner fails the first attempt, a second test is offered. If the second test is failed, learners are asked to review their test results with their designated educator to assess the learner's needs and aid in the development of a learning plan to achieve competency.

For the third step, we developed an online dysrhythmia education course for situations in which competence is not achieved after the two tests, or if learners want to refresh their knowledge. This course, which helps learners reach the necessary level of competence to practise safely, covers topics of cardiac anatomy and physiology, and cardiac dysrhythmia identification and management. Multiple resources (Aehlert, 2011; Betts et al., 2019; Jaffe et al., 1991; T. Libby & N. Heppell, personal communication, May 19, 2010; Molnar & Gair, 2019; Shackell & Gillespie, 2009; Washington Heart Associates LLC., 2015) were utilized to ensure course content is current and evidence-based. The education course includes nine modules with 162 slides, and 60 practice questions distributed throughout the modules. This education course also acts as refresher to help individuals review the essentials of cardiac care and monitoring while testing their knowledge with a quiz after each learning module. Last, the practical component of the dysrhythmia program provides a guideline of objectives and goals that are identified by the educator and participant who needs further practical simulation.

The education and competency modules were uploaded to the FH Learning Hub, with the help of an expert in web design. Many health authorities in BC currently utilize the Provincial Health Services Authority (PHSA) online learning portal, also known as the Learning Hub. These health authorities include FH, Island Health, Northern Health, Providence Health Care, PHSA, and Vancouver Coastal Health. The Learning Hub houses education materials in a convenient and accessible way that can be completed online, or in classrooms, depending on the instruction method. The Learning Hub has been underutilized with regard to dysrhythmia competency programs and, therefore, provided a unique platform from which to launch a comprehensive dysrhythmia education and competency program for FH. This learning portal also provides an opportunity to share this tool outside of FH in future. When compared to the cost of the other dysrhythmia education and training options illustrated in Table 3, Learning Hub is the most cost-effective method of delivery, with no cost to the employee. Learning Hub provides a platform that is easy to access, uses existing infrastructure, and has built-in tools for monitoring competency testing, and measuring use and outcomes in the future.

Of interest is that online learning platforms have been found to be as effective in developing knowledge as instructor-led programs (Bazrafkan & Hemmati, 2018; Gonzalez, O'Brien-Barry, Ancheta, Razal, & Clyne, 2017).

While the original intent was to make the competency test an annual mandatory requirement for all nurses working in cardiac monitored areas, at the time of launch, this was not approved by FH's professional practice department, as it did not align closely enough with the Ministry-mandated required education topics. This shifted our intention to encourage all new RNs working in FH cardiac monitoring areas to complete the competency test at the time of hire, irrespective of previous telemetry training. All other RNs working in cardiac monitoring areas would be encouraged to complete the dysrhythmia competency test annually. Our goal is to ensure that all nurses monitoring cardiac patients have the same level of competency, as demonstrated by passing the standardized test.

The education course can be taken as a refresher prior to taking the competency test or for additional education if the employee is unsuccessful in the competency test. Furthermore, the education course can be used as a complete nine-module program, or learners can select individual modules to study where they think their learning may need improvement. Educators can also use this education course to help learners focus their learning needs in order to maintain competency. For example, if a learner does not pass the competency test due to lack of ventricular rhythm recognition, then the ventricular rhythm module can be reviewed. The requirement for completion of the education and competency test modules is determined by the individual unit educators and managers, as is any financial reimbursement for completion of the modules or competency tests. From a FH perspective, the dysrhythmia education and competency course is strongly recommended, but is not a mandatory

Implementation

After we developed all the components of the dysrhythmia education and training, and uploaded them onto a test Learning Hub platform, we completed a three-week peer review period. During this time, more than 60 individuals from various nursing specialty groups in FH reviewed the materials and had an opportunity to provide comments on the content. This valuable end user feedback was incorporated in the revisions of the competency test and education modules prior to launching the program live on June 5, 2019.

The dysrhythmia program was distributed via email to all FH educators and FH managers who were encouraged to share the modules with their individual groups at all sites to ensure that all employees who should be trained in cardiac rhythm identification management had the opportunity to be prepared with the necessary knowledge and skills to do so. While this program was developed specifically for nurses, because every FH employee has access to Learning Hub, they all now had access to the dysrhythmia education and competency program free of charge and at their convenience.

Evaluation

Part of the development process was to set measurable outcomes, including improving: 1) health outcomes, 2) staff competence and skill levels, and 3) system performance.

Health outcomes are an important indicator and can be used to track performance. Health outcomes include patient safety and quality of care provision. Currently, for this program, health outcomes related to the program are difficult to measure, as patient safety events related to dysrhythmias are rarely documented and often under-reported. Steps to improve this and develop strategies for more accurate reporting of dysrhythmia-related incidents are planned for future. In the meantime, however, if nurses are improving their dysrhythmia knowledge and skills, there should be a resultant improvement in patient safety outcomes.

Improving staff competence and skill levels were measured via a short 10-question survey that was emailed to 94 participants one month after the program was launched on Learning Hub. The participants who were included in the survey had either registered for the competency, the education modules, or both. The survey included questions related to the employee's area of practice, level of cardiac experience, years of experience, confidence levels, and perceived value of the modules. The goal was to evaluate if the content was applicable, determine participant demographics, and track confidence levels with monitoring cardiac rhythms. While the response rate was low (*n*=13; response rate = 14%), it did highlight certain factors. Most participants who registered for either the competency test or the education course had already successfully completed an accredited dysrhythmia course (69%), were primarily working in cardiac (38%) or emergency (38%) areas, in community hospitals (59%), and tertiary care (41%). Most survey respondents had more than 10 years' monitored care experience (38.5%) and after participating in the dysrhythmia competency or education, based on a scale of 0 to 100, felt 77% confident of their cardiac monitoring skills. This confidence level in correctly interpreting a cardiac rhythm is similar to that in the published literature, which ranges from 77% (Begg et al., 2016) to 88% (Bae et al., 2012; Shah & Rubin, 2007). While these modules are not mandatory or a requirement for work, most survey respondents stated that they completed the education modules for their own personal interest (54%) for review (46%) and/or as a refresher (54%).

System performance is an indication of the efficiency or cost-effectiveness of a healthcare service. The Learning Hub has tools to track participant numbers and test results. One month after launching the program, there were 189 registered users: 80 registered users signed up for the competency test module and 109 registered users selected the education module; after four months, there were more than 330 registered users of the two modules. While the emergency and critical care departments had originally opted out of using the modules, the survey results showed the opposite; these high-acuity areas were where most registered participants for the dysrhythmia program were located. After live launch, there were also several requests from outside of FH to gain access to the learning modules. Employees of Fraser Health who worked at other health authorities in the Province of BC were disseminating the information to other sites. Due to this demand, the working group agreed that the course would be open to the public later this year after some final graphic edits and aesthetic improvements.

Preliminary results suggest that the dysrhythmia education and competency modules launched on the Learning Hub platform have knowledge value for employees of FH working in cardiac monitored areas. The preliminary outcomes for increasing nursing confidence, knowledge and skills, and system performance are positive. In the short term, the participation numbers are continuing to increase. As well, there is interest in our program from outside of our health authority, prompting the move to make the modules accessible to the public later in 2019.

Discussion

The goal of the regional dysrhythmia program is to ensure that all nurses who should be trained in telemetry identification and management are able to access this training, and set a region-wide minimum standard for competency. During the development process, it was noted that there were limited standardized in-house resources for dysrhythmia training available online that were cost effective for most healthcare professionals. There are several reasons why more in-house developed dysrhythmia competency tools do not exist in BC. First, to develop a program, even a small one, is costly because it requires extensive work and takes months of preparation, consultation, and evaluation. The market share of education surrounding this topic is well protected by the various large academic institutions in the area. While these academic programs are excellent in content, they are often out of the financial and geographical reach of the average individual. Second, if the health authority were to cover the cost for each individual participant attending these institutions for training, it would amount to an exorbitant sum each year. Moreover, these existing academic programs do not offer regular competency testing for employees once the course is complete. There is a need to provide easy affordable access to high-quality testing and training, maintain and sustain knowledge, and encourage annual review of learning. Therefore, our program was a practical, feasible, and economic solution.

This education program may also serve as a template for the development of similar programs in other regions across the country. The benefit of using the logic model to guide program development and implementation is threefold. First, it helps to communicate the intention of the program to those individuals outside of the program development team in a concise way. Second, it delineates the key principles that guide the program, namely that it needs to be nurse-centred and driven, appropriate and effective, and accessible. Third, it defines the program outcomes that can be evaluated to measure program success, for example, improved system performance and improved nursing competence. The logic model is a visual way to illustrate the resources, the activities, and the desired program outcomes for this dysrhythmia education program. There are a few key factors to consider when developing a regional dysrhythmia education and competency program. The developers in the working group require expert knowledge and skills to ensure the legitimacy and validity of the program. The content should be evidence-based, relevant, and easily accessible for the end users. Last, the outcomes that are set to assess performance need to be measurable and should be used to inform ongoing improvements of the program.

Challenges in developing our program included broadening the scope of the education and competency to meet the needs of not only cardiac nurses, but rather all nurses providing cardiac monitoring to patients; many of these nurses work in areas outside of cardiac units. This required that the content be less detailed in pathophysiology and broader in nature, shifting the focus to topics that were most important to improve patient outcomes, like recognition and management of life-threatening dysrhythmias. Challenges with implementation included that there is no funding provided for completion of the dysrhythmia education and competency modules. This lack of compensation may have an effect on participation rates. Importantly, we have yet to develop a regional strategy to ensure ongoing nursing competency, as this program is not mandatory. Many cardiac units in the bigger hospitals in FH have informed their staff that the competency test is an annual requirement. However, without financial compensation for completing the modules, there is the increased potential for non-compliance. In addition, measuring outcomes is critical to the program evaluation process. To this end, we plan to continue to track participation rates, record events that involve miss-identification or miss-management of dysrhythmias, and evaluate the utility and cost-effectiveness of the program.

Limitations of the project included the relatively small sample sizes for the needs assessment and initial program survey. Therefore, the data may not be representative of the population of interest. However, further surveys of program participants are planned for the future. Fiscal constraints necessitated the use of existing infrastructure and the online format to ensure free and accessible access to the modules. While the literature indicates that online learning is as effective as in-person learning (Bazrafkan & Hemmati, 2018; Gonzalez et al., 2017), some participants do report greater learning potential with in-person instruction.

Relevance to Clinical Practice

To practise safely in a cardiac monitored area, a nurse requires adequate skills and competencies to correctly identify and manage abnormal cardiac rhythms. Recognizing and managing life-threatening dysrhythmias may be common practice for some RNs, but for others, especially in smaller rural sites, this high-risk, low-frequency situation could have negative outcomes if not handled correctly. For all nurses monitoring cardiac patients in Canada, competency in dysrhythmia identification and management should be a priority. The FH cardiac network has made it a strategic priority to provide regional education and ensure competency for all nurses working in cardiac monitored areas.

Conclusion

Competency in cardiac rhythm interpretation and management is a critical skill for nurses working in a cardiac monitoring environment. However, based on a needs assessment, we determined that there was considerable variation in the skill levels of nurses who worked in monitored areas, as well as the employer requirements for cardiac rhythm training in our region. Therefore, we set out to develop a regional education program that would establish a minimum standard of knowledge for safe nursing practice in cardiac monitoring areas. The dysrhythmia education and competency program developed within FH has been successful in providing a cost-effective and accessible means for nurses to gain knowledge and skills relating to cardiac monitoring care. Moreover, the program development process, guided by a logic framework, may serve as a template for other regions in planning a similar program. Initial outcomes of the program suggest that the dysrhythmia modules have value in improving employee competence and confidence. Implications for nursing practice include the potential for more accurate and timely identification of cardiac dysrhythmias that, in turn, may improve patient care and safety outcomes.

REFERENCES

Aehlert, B. (2011). *ECGs made easy*. Mosby: Elsevier. Missouri.

Bae, M. H., Lee, J. H., Yang, D. H., Park, H. S., Cho, Y., Chae, S. C., & Jun, J. E. (2012). Erroneous computer electrocardiogram interpretation of atrial fibrillation and its clinical consequences. *Clinical Cardiology*, *35*(6), 348–353. https://doi.org/10.1002/clc.22000

Bazrafkan, L., & Hemmati, M. (2018). The effect of cardiac arrhythmias simulation software on the nurses' learning and professional development. *Journal of Advances in Medical Education & Professionalism*, *6*(2), 86–91.

Begg, G., Willan, K., Tyndall, K., Pepper, C., & Tayebjee, M. (2016). Electrocardiogram interpretation and arrhythmia management: A primary and secondary care survey. *British Journal of General Practice*, *66*(646), e291–e296. https://doi.org/10.3399/bjgp16X684781

Betts, J., Desaix, P., Johnson, E., Johnson, J,. Korol, O., ... Young, K. (2019). Anatomy and Physiology [e-textbook]. Houston, TX: Openstax College. Retrieved from https://opentextbc.ca/anatomyandphysiology/

Birnbaum, M., Robinson, N., Kuska, B., Stone, H., Fryback, D., & Rose, J. (1994). Effect of advanced cardiac life-support training in rurual, community hospitals. *Critical Care Medicine*, *22*(5), 741–749. https://doi.org/10.1097/00003246-199405000-00007

Burnett, G., Goldberg, A., DeMaria, S., Levine, A., & Katz, D. (2019). Knowledge retention after simulated crisis: importance of independent practice and simulated mortality. *British Journal of Anaesthesia*, *123*(1), 81–87. https://doi.org/https://doi.org/10.1016/j.bja.2019.02.030

Dane, F., Russel-Lindgren, K., Parish, D., Durham, D., & Brown, T. (2000). In-hospital resuscitation: Association between ACLS training and survival to discharge. *Resuscitation*, *47*(1), 83–87. https://doi.org/10.1016/S0300-9572(00)00210-0

Fraser Health. (2015). *Fraser Health acute care standard: nursing cardiac services telemetry and non-monitored unit*. Fraser Health, BC: Fraser Health Authority. Acute Care Standard version 1.0. Retrieved from http://fhpulse/clinical_resources/clinical_policy_office/Lists/CDST%20Library/DispForm.aspx?ID=1249

Funk, M., Fennie, K. P., Stephens, K. E., May, J. L., Winkler, C. G., & Drew, B. J. (2017). Association of implementation of practice standards for electrocardiographic monitoring with nurses' knowledge, quality of care, and patient outcomes. *Circulation: Cardiovascular Quality and Outcomes*, *10*(2), 1–10. https://doi.org/10.1161/CIRCOUTCOMES.116.003132

Gilligan, P., Bhatarcharjee, C., Knight, G., Smith, M., Hegarty, D., Shenton, A., ... Bradley, P. (2005). To lead or not to lead? Prospective controlled study of emergency nurses' provision of advanced life support team leadership. *Emergency Medicine Journal*, *22*(9), 628–632. https://doi.org/10.1136/emj.2004.015321

Gonzalez, R., O'Brien-Barry, P., Ancheta, R., Razal, R., & Clyne, M. (2017). Peer education versus computer-based education: Improve utilization of library databases among direct care nurses. *Journal of Nursing Professional Development*, *33*(4), E1–E5. https://doi.org/10.1097/NND.0000000000000371

Jaffe, A.S., Atkins, J., Field, J., Fransice, C., Gibson, R., ...Weaver, W.D. (1991). Recommended guidelines for in-hospital cardiac monitoring of adults for detection of arrhythmia. *Journal of the American College of Cardiology, 18*(6), 1431–1433. https://doi.org/10.1016/0735-1097(91)90670-5

Kapurkar, K., Sandhya, J., & Babar, R. (2017). To assess the effectiveness of structured teaching programme on knowledge and knowledge of practice regarding advanced cardiac life support among staff nurses. *International Journal of Scientific Research, 6*(5), 431–435. https://doi.org/10.15373/22778179

Little, B., Ho, K. J., & Scott, L. (2001). Electrocardiogram and rhythm strip interpretation by final year medical students. *Ulster Medical Journal*, *70*(2), 108–110. PMCID: PMC2449230

Mashikian, R. (2019). Nursing education for newly implemented cardiac monitoring and titratable medications in a stem cell transplant unit. *Biology of Blood and Marrow Transplantation*, *25*(3), S439–S440. DOI: https://doi.org/10.1016/j.bbmt.2018.12.477

McGrath, A., & Sampson, M. (2018). Electrocardiograms: a guide to rhythm recognition for emergency nurses. *Emergency Nurse*, *26*(1). https://doi.org/https://doi.org/10.7748/en.2018.e1767

Molnar, C & Gair, J. (2019). Concepts of Biology – 1st Canadian edition. [e-textbook]. Houston, TX: Openstax College. Retrieved from https://opentextbc.ca/biology/front-matter/preface-to-the-1st-canadian-edition/

Rodriguez Muñoz, D., Alonso Salinas, G., Franco Diez, E., Moreno, J., Matía Francés, R., Hernández-Madrid, A., & Zamorano, J. (2016). Training in management of arrhythmias for medical residents: a case-based learning strategy. *International Journal of Medical Education, 7*, 322–323. https://doi.org/10.5116/ijme.57c2.a738

Sanders, A., Berg, R., Burress, M., Genova, R., Kern, K., & Ewy, G. (1994). The efficacy of an ACLS training program for resuscitation from cardiac arrest in a rural community. *Annals of Emergency Medicine, 23*(1), 56–59. DOI: 10.1016/s0196-0644(94)70009-5

Shackell, E. & Gillespie, M. (2009). The Oxygen Supply and Demand Framework: A tool to support integrative learning. *Dynamics: The Official Journal of the Canadian Association of Critical Care Nurses. 20* (4), 15-19. PMID: 20088357

Shah, A., & Rubin, A. (2007). Errors in the computerized electrocardiogram interpretation of cardiac rhythm. *Journal of Electrocardiology, 40*(5), 385–390. https://doi.org/https://doi.org/10.1016/j.jelectrocard.2007.03.008

Throndson, K., Davis, V., Gohn, W., Walton, L., & Bergner, T. (2012). The 2C ECG project: Identifying factors that influence nurses confidence and competence with ECG monitoring. *CCCN Abstracts*, S427. Health Sciences Centre, Winnipeg, MB.

W.K. Kellogg Foundation. (1998). W.K. Kellogg Foundation Logic Model Development Guide. Retrieved from https://www.bttop.org/sites/default/files/public/W.K. Kellogg LogicModel.pdf

Washington Heart Associates LLC. (2015). Arrhythmias. Washington DC. Retrieved from http://www.washingtonhra.com/arrhythmias/ventricular-tachyarrhythmias.php

Webster, C., Hallett, C., Torrie, C., Verstappen, A., Barrow, M., Moharib, M., & Weller, J. (2018). Advanced cardiac life support training in interprofessional teams of undergraduate nursing and medical students using mannequin-based simulation. *Medical Science Educator, 28*(1), 155–163. https://doi.org/https://doi.org/10.1007/s40670-017-0523-0

Zègre-Hemsey, J. K., Garvey, J. L., & Carey, M. G. (2016). Cardiac monitoring in the emergency department. *Critical Care Nursing Clinics of North America, 28*(3), 331–345. https://doi.org/10.1016/j.cnc.2016.04.009

Advance Care Planning in Heart Failure: A Narrative Synthesis of the Perspectives of Patients, Family Members, and Healthcare Providers

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Abstract

Context: *Advance care planning (ACP) is a process whereby people articulate personal values and goals and identify a substitute decision-maker to guide future medical treatment or end-of-life care. As rates of heart failure (HF) continue to rise, guidelines recommend ACP be initiated early in the disease trajectory. However, the majority of HF patients do not participate in ACP.*

Objective: *To provide an examination of current ACP literature for nurses working with the HF population and synthesize perspectives of patients, family members, and healthcare providers.*

Methods: *Seven databases were searched. Eligible studies explored ACP or end-of-life (EOL) decision-making for patients with HF.*

Results: *1,134 articles were identified; 43 articles were included in the final review. Key themes related to ACP in HF included uncertainty, timing, discomfort, relationships, and responsibilities.*

Conclusion: *Most ACP research is exploratory or interventional; future research should examine the social and relational nature of this complex process.*

Killackey, T., Peter, E., MacIver, J., & Mohammed, S. (2019). Advance Care Planning in Heart Failure: A Narrative Synthesis of the Perspectives of Patients, Family Members, and Healthcare Providers. *Canadian Journal of Cardiovascular Nursing, 29*(3), 16–25.

Clinical Highlights

- Currently, the majority of HF patients do not participate in ACP, despite educational interventions and clinical guideline recommendations.
- ACP relies heavily on relationships. This review highlights the social and relational nature of ACP and EOL decision-making for patients living with HF.
- As healthcare providers closest to patients and families, nurses should develop competence and confidence to initiate ACP conversations.
- Nurse researchers should examine the social and relational aspects of ACP and work to highlight the potential opportunity for nurses to increase their involvement in the ACP process.

Cardiovascular disease is the leading cause of hospitalization and the second leading cause of death in Canada (Canadian Institute for Health Information, 2017; Statistics Canada, 2017). Heart failure (HF) is a chronic, progressive, and terminal cardiovascular disease, characterized by weakened or damaged muscle, resulting in the heart's inability to pump blood efficiently. Heart failure is also the end result of many common cardiovascular diseases such as hypertension, coronary artery disease, myocardial infarction, and cardiac arrhythmias (American Heart Association, 2015). There are currently more than 600,000 Canadians living with HF and more than 50,000 patients newly diagnosed with HF annually (Heart and Stroke, 2016). As more Canadians survive cardiovascular diseases due to improvements in diagnostics and management, the prevalence of HF continues to rise (Heart and Stroke, 2016).

Advance care planning (ACP) is a process whereby individuals reflect on and articulate personal values and goals and identify a substitute decision maker in order to direct healthcare decisions and guide future medical treatment or end-of-life (EOL) care (McMahan, Knight, Fried, & Sudore, 2013). Current HF management guidelines recommend that ACP be initiated early and often in the disease trajectory. Most recommendations favour a proactive approach and suggest discussing ACP during specific milestones, such as with each hospitalization, change in health status, or device implantation (Allen et al., 2012). Participating in ACP has been associated with increased quality of life, fewer acute care admissions, lower rates of depression and anxiety in caregivers, and lower healthcare costs at the EOL (Detering, Hancock, Reade, & Sylvester, 2010; Denvir, Murray, & Boyd, 2015; Dixon, Matosevic, & Knapp, 2015; Zhang et al., 2009). Increasing ACP engagement for HF patients could lead to decreased rates of hospital admission, decreased stress and anxiety, improved patient-provider communication, and increased patient and family satisfaction with EOL care (Dev, Abernethy, Rogers, & O'Connor, 2012; Teno, Gruneir, Schwartz, Nanda, & Wetle, 2007). Currently, the majority (76%) of HF patients do not participate in ACP, despite educational interventions and clinical guideline recommendations (Butler et al., 2015; Chow & Senderovich, 2018; Evangelista et al., 2012; Habal, Micevski, Greenwood, Delgado, & Ross, 2011). The literature outlines common barriers to this practice, which will be discussed in this review. One aspect, however, that is not frequently addressed in this research is that ACP is often perceived as an individual process and is provided to patients and families using an individualized model of care (Singer et al., 1998; Sudore & Fried, 2010). There is some evidence to suggest that the individualized model is incongruent with the realities of the ACP experience, leading to low rates of participation. However, this claim requires further examination (Killackey, Peter, MacIver, & Mohammed, 2019; Robinson, 2011; Singer et al., 1998).

The purpose of this review is to provide a synthesis of literature related to ACP in the HF population with a focus on the relationships among patients, family members, and healthcare providers (HCP). A relational approach provides an alternative perspective from the current conceptualization of ACP as a practice grounded in individualistic autonomy. Overall, this review will highlight the relational nature of ACP as an inherently social process and provide a starting point from which further exploration of ACP in the context of chronic disease management can occur. Importantly, viewing ACP through a social lens highlights the important role nurses play in this process, and identifies potential opportunities for nurses to enhance the ACP experience for patients and their families.

Methods

We conducted a systematic literature review and narrative synthesis. The finalized search strategy used for this review was developed with the support of an Information Specialist. Based on the goal and content of the search, the following databases were used: CINAHL, MEDLINE, MEDLINE In Process, PsycINFO, Scopus, and Sociological Abstracts. MeSH headings (MH) and keywords to identify the population were selected based on a HF search hedge developed at the University Health Network and the search was completed on June 20, 2016. MH related to ACP were selected based on a recent systematic review that examined the practice of ACP (Johnson et al., 2015). Examples of specific MH and keywords (*) included: advance care planning (MH), advance directive (MH), living will*, power of attorney*, substitute decision maker, patient/healthcare provider/family member experience*, patient/family/healthcare provider perspective*, heart failure (MH).

In total, 1,134 unique articles were identified; duplicates were removed, and articles were then reviewed by title and abstract for eligibility (See Figure 1: PRISMA Diagram). Articles were included if they met one of the two following criteria groups:

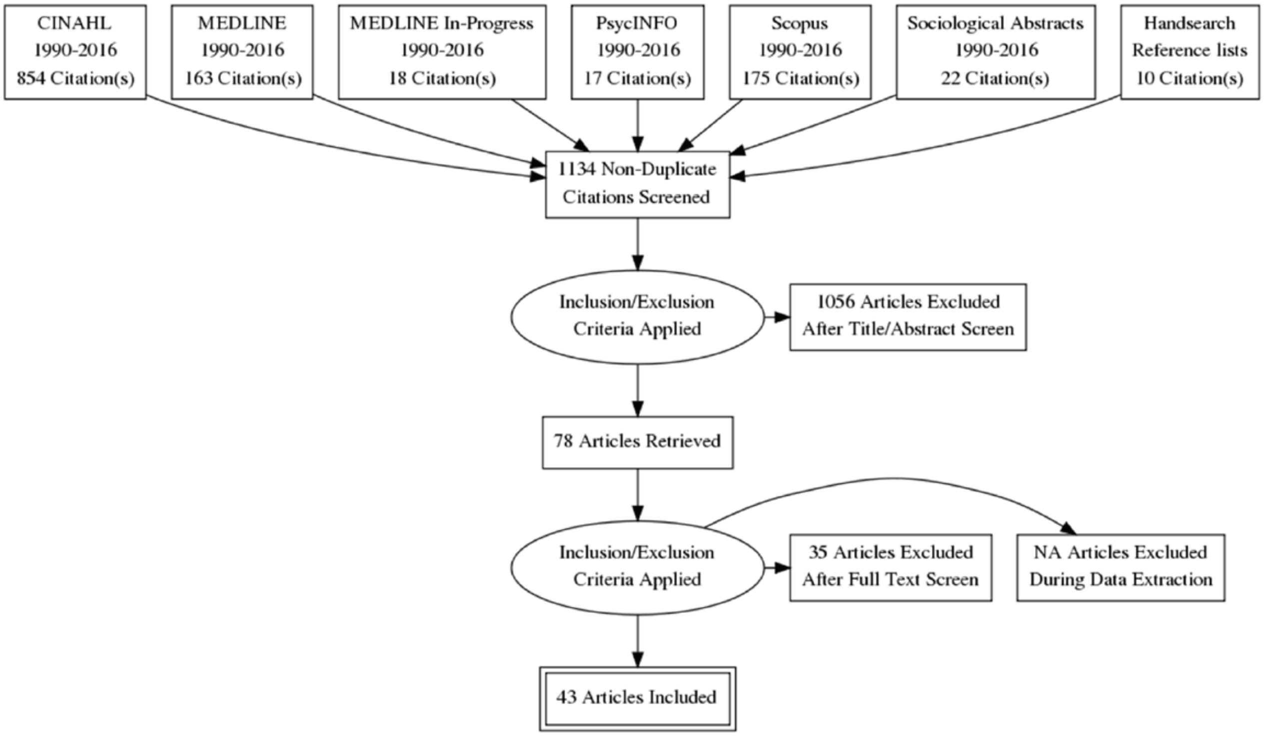

Figure 1. **PRISMA Diagram: Literature Search Strategy**

1. Studies examining ACP practices, implementation, interventions, prevalence, or awareness in the HF population
2. Studies examining the perspectives, experiences, or EOL preferences of patients with HF, their family members, or their HCP.

Articles providing ethical or moral examinations of ACP were used for contextual development. Seventy-eight articles were selected for full-text review and 43 articles were included in the final synthesis of results (see Figure 1: PRISMA Diagram). Hand searching produced 10 articles, one of which was included. Data extracted from full-text reviews included research objectives, study design, population, methodology, findings, limitations, and future research suggestions. Quantitative studies were appraised using the Critical Appraisal Skills Program (CASP, 2019) guidelines and qualitative research was appraised using both CASP guidelines and Eakin and Mykhalovskiy's (2003) guidelines for qualitative research assessment. This approach was chosen in order to avoid a proceduralistic evaluation of qualitative research, and instead focus on substantive contributions by using individual study methods as a resource for understanding the respective study results (Eakin & Mykhalovskiy, 2003).

Studies were selected based on their ability to provide an overview of the key features of ACP within this population; studies with perspectives on ACP as a social, emotional, and relational process were examined in relation to those using a traditional individualist approach. This approach is consistent with the style of literature review being conducted because narrative reviews are best suited to presenting a broad perspective on a topic using theory and context and presenting philosophical perspectives in a balanced manner (Green, Johnson, & Adams, 2001). In the case of this review, the narrative style works to highlight the juxtaposition between individualistic and relational accounts of autonomy in the context of ACP as a healthcare practice. Narrative reviews do not provide aggregate data but, instead, provide an interpretation of current research by developing relevant themes and broadening understandings of a particular phenomenon. The phenomenon under exploration in this review is ACP and the way it is framed as an autonomy-enhancing practice within the chronic illness context (Grant & Booth, 2009).

Results

Overall, 43 studies were included in this review. Most were published within the past 10 years (*n*=30 published since 2010) and were heterogeneous in design. Overall, the current state of the literature in this field is focused on interventional and exploratory research. Designs ranged from observational (*n*=17), interventional (*n*=8), and qualitative (*n*=13), as well as a small number of mixed methods studies (*n*=2) and literature reviews (*n*=3). Studies encompassed a broad spectrum of topics, from evaluation of ACP interventions to examination of preferences for treatment, as well as exploration of perceptions and experiences of patients, family members, and HCP participating in ACP.

Current Practices

Prevalence and awareness of ACP in cardiac patients. A number of researchers have examined the status of ACP in the cardiovascular population by conducting surveys examining awareness and prevalence of advance directives. Advance directives (ADs) can be defined as the documentation component of ACP, and usually consist of one or both of the following elements:

1. A legally designated substitute decision maker (SDM)
2. A written declaration of personal values, wishes, or specific treatments the patient would accept or not accept when they are incompetent or unable to provide personal consent (often called a living will) (Tajouri, Ottenberg, Hayes, & Mueller, 2012; Tobler, et al., 2012b).

Recent studies have suggested there is a wide range of awareness and prevalence of ADs in the HF population. Most significantly, two Canadian quantitative studies demonstrated that only 24–44% of HF and congenital heart defect patients (who either have HF or have a high likelihood of developing HF) were aware of ADs (Habal, 2011; Tobler et al., 2012b). When examining the prevalence of ADs in patients with HF and those who were receiving implantable cardiac pacemakers and/or cardioverter defibrillators, between 30–59% of patients had ADs, and patients with an AD were more likely to be white and older than patients who did not have an AD (Pasalic, Tajouri, Ottenberg, & Mueller, 2014; Tajouri et al., 2012). Using ADs as a proxy outcome measure for the success of the ACP process within the HF population suggests a significant lack of patient uptake and completion, as well as low rates of overall awareness.

ACP and device deactivation. One unique component of ACP in the HF population is the prevalence of medical devices, such as left ventricular assist devices (LVADs) and implantable cardioverter-defibrillators (ICDs), and the need to manage these devices at EOL. An example of a challenging decision within the trajectory of advanced HF includes the decision to implant an ICD. Patients with advanced HF often do not understand their prognosis, their need for an implantable device, or the function of the device throughout the HF experience (Habal et al., 2011; Russo et al., 2011). This lack of understanding contributes to challenges experienced during decision-making and the ACP process, as patients and their families may not have the requisite information or understanding to support informed decision-making or ACP (Ahluwalia & Enguidanos, 2015; De Vleminck, 2013; De Vleminck, 2014; Greutmann, 2013; Lee et al., 2017; MacIver, Tibbles, Billia, & Ross, 2016).

ICD deactivation is a challenging issue for patients and HCP alike. Habal et al. (2011) revealed that only 11% (*n*=2) of study patients who had ICDs were aware that their devices could be deactivated. Similarly, Tajouri et al. (2012) reported that only 2% (*n*=2) of the ADs completed by study patients with ICDs mentioned the device or its deactivation at the EOL. A systematic review of clinical practices and provider and patient attitudes regarding deactivating ICDs at the EOL suggested that deactivation is discussed with less than half of patients receiving ICD implantation (Russo et al., 2011). Overall, these results align with previous studies demonstrating that 30-60% of patients with ICDs or LVADs report having ADs, but very few directives actually mention cardiac devices or specify their preferences for management at the EOL (Pasalic et al., 2014).

In general, a limitation of the majority of survey-based studies is that a documented AD is equated with completing ACP (Connors, Dawson, Desbiens, et al., 1995; Habal et al., 2011; Heffner & Barbieri, 2001; Pasalic et al., 2014; Sadeghi, Walling, Romano, Ahluwalia, & Ong, 2016; Schellinger, Longbottom, & Briggs, 2011; Tajouri et al., 2012; Tobler et al., 2012b). This conceptualizes ACP as a practice in which autonomy is exercised at one discreet time point (i.e., the moment the AD is signed) and that the contents of ADs are meant to guide all future decisions. This conceptualization fails to recognize ACP as a process that may change over time and deserves continuous attention, re-examination, and flexibility. Additionally, there are inherent limitations when examining existence of documentation: (1) documents may exist, but may not be filed in the medical record, (2) patients may state they have completed relevant documentation when they have not, and (3) the SDM may not be aware of the existence or location of documents (Shapiro, 2015). These findings are especially significant, considering the central role that SDMs can play at EOL.

ACP Interventions

The Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatments (SUPPORT) trial in 1995 was one of the largest population-based studies to date, which examined the impact of ACP interventions on patients' EOL care using both observational data and randomized controlled trial results. This four-year study, which followed more than 9000 patients with various chronic diseases (including HF), involved specially trained nurses who were tasked to determine patient preferences, improve understanding of potential outcomes, encourage attention to pain control, facilitate ACP, and provide physicians with timely and reliable prognostic information in order to facilitate communication and decision-making (Connors, Dawson, Desbiens, et al., 1995). Unfortunately, study results demonstrated that this intervention was largely unsuccessful as it did not improve any outcome measures (e.g., median time until DNR written, DNR documentation, pain control, resource use, or presence of undesirable states such as being in an ICU setting, receiving mechanical ventilation, or being comatose), even though the study had sufficient power to detect even small improvements in EOL communication and decision-making (Connors, Dawson, Desbiens, et al., 1995).

Since the SUPPORT study, many clinicians have worked to re-imagine and implement novel ACP interventions designed to initiate or improve ACP practices in various settings. This review identified eight studies conducted since the SUPPORT trial that assessed ACP interventions within the cardiovascular population; settings included pre-operative cardiac surgery clinics, cardiovascular rehabilitation programs, homecare organizations, and inpatient hospital units. These studies are discussed in detail below.

Facilitated discussion and SDM interventions. Kirchhoff and Briggs are prominent nurse-researchers in the field of ACP and have contributed to the development of a number of intervention studies that have examined the impact of ACP in patients with HF (Briggs et al., 2004; Kirchhoff et al., 2010; Kirchhoff et al., 2012; Schellinger et al., 2011; Song et al., 2005). In all of these studies, patient-centred advance care planning (PC-ACP) or the similar disease-specific advance care planning (DS-ACP) interventions were provided to patients with symptomatic HF (Briggs et al., 2004; Kirchhoff et al., 2010; Kirchhoff et al., 2012; Schellinger et al., 2011) or patients undergoing cardiac surgery (Song et al., 2005). The intervention was a one-hour, five-stage discussion among a trained facilitator, the patient, and the SDM in order to develop an ACP. Five studies measured post-intervention AD documentation rates (Schellinger et al., 2011), patient-SDM congruence, and decisional conflict (Briggs et al., 2004; Kirchhoff et al., 2010; Song et al., 2005). Another study compared stated preferences with care received at the EOL (Kirchhoff et al., 2012). All studies found increased levels of ACP documentation (Schellinger et al., 2011), improvements in patient-SDM congruence, decreased decisional conflict in the intervention groups (Briggs et al., 2004; Song et al., 2005; Kirchhoff et al., 2010), and a general willingness to discuss preferences with a trained facilitator (Kirchhoff et al., 2012).

The major limitation of these studies is the generalizability to other health systems. Three of these studies were completed in American hospitals already using the *Respecting Choices* PC-ACP intervention program to improve the rates of ACP completion. These hospitals are located in regions with very ethnically homogeneous populations and many of the researchers noted that results had limited generalizability due to study samples being predominantly white (Kirchhoff et al., 2010; Song et al., 2005; Schellinger et al., 2011). Others have identified whites as the group most engaged in ACP, arguing that this may be related to their ability to identify with individualistic values (Barnato, Anthony, Skinner, Gallagher, & Fisher, 2009; Evangelista et al., 2012). Therefore, the positive results found by implementing ACP programs in these settings may not be easily generalized to populations with more racial diversity, but they do suggest race and socio-economic status may influence the practice of ACP, including access barriers to non-white populations.

Educational interventions. Three reviewed studies examined the impact of educational interventions on completion of ACP documentation in cardiovascular populations (Evangelista et al., 2012; Heffner & Barbieri, 2001; Sadeghi et al., 2016). All studies found that patients who received ACP education (through a workshop presentation, educational video, or palliative care consultation session) demonstrated higher understanding of ACP and that these interventions were feasible in their respective settings (Evangelista et al., 2012; Heffner & Barbieri, 2001; Sadeghi et al., 2016). However, based on documentation rates, educational interventions alone do not increase participation in the ACP process for cardiovascular patients (Evangelista et al., 2012; Heffner & Barbieri, 2001).

End-of-Life (EOL) Preferences

Since the publication of the SUPPORT study, HCPs and researchers have made significant efforts to understand the EOL preferences of patients with HF. Four quantitative studies have used trade-off tools to examine whether HF patients favour quality of life compared with quantity of life and how these preferences might influence treatment decisions (Brunner-La Rocca et al., 2012; Kraai et al., 2013; MacIver et al., 2008; Stevenson et al., 2008). Time trade-off techniques use hypothetical scenarios to better understand patient preferences (MacIver et al., 2008) and measure patients' preferences for quality versus quantity of life. When exploring patients' preferences for quality of life compared to quantity of life, findings have been varied and often contradictory. Brunner-La Rocca et al. (2012) used the time trade-off tool (TTO) to demonstrate that at baseline and at 12- and 18-month follow-up points, the majority (74%) of HF patients (n=410) were not willing to trade any survival time for excellent health. Conversely, using the same approach, Kraai et al. (2013) found that 61% of their sample of HF patients (n=61) were willing to trade time in order to achieve improved quality of life, although there was significant variability in the amount of time patients were willing to trade. These studies suggest that patients are heterogeneous in regard to these values and, in general, it cannot be assumed that patient values are fixed, or that they are similar to the values held by HCPs (Karimi & Clark, 2016). There are also significant limitations to using the TTO, including the hypothetical nature of questions, which make it challenging to correlate research-based responses to the decisions patients would make in reality.

MacIver et al. (2008), developed a modified TTO, which allowed for exploration of treatment preferences relevant to HF patients (n=91). This study identified that HF patients either preferred treatments to increase survival time or favoured strategies to improve quality of life. The authors did not find significant predictors for treatment preference, including sex, ejection fraction, jugular venous pressure, and HF progression (MacIver et al., 2008). Some studies that examined treatment preferences of HF patients have established that preferences for life-sustaining treatment change over time are based on the burden of treatment, and the likelihood of a positive outcome (Fried, Bradley, Towle, & Allore, 2002; Fried, Bradley, & O'Leary, 2003, Fried, Byers, et al., 2006, Fried, O'Leary, et al., 2007; Janssen, Spruit, Schols, & Wouters, 2011; Janssen et al., 2013). In addition, investigators have reported a complex relationship between health status and life-sustaining treatment preferences, which is likely influenced by numerous factors such as symptom burden, the affective state of patients and their family members, environmental and relational stressors, and other transient factors (Janssen et al., 2013).

When interpreting the results of these studies, there are limitations related to small sample size, type of sampling (i.e., often convenience sample), and the use of surveys. In quantitative research, surveys provide a limited number of prescribed outcome choices for participants completing these measures, which may hinder an in-depth analysis of preference formation as a complex and dynamic process (Fried & Bradley, 2003; Fried et al., 2006; Janssen et al., 2011; Janssen et al., 2013; MacIver et al., 2008; MacIver et al., 2016). Additionally, in many studies, groups of patients were examined with a variety of chronic illnesses, not only HF (Fried et al., 2002; Fried, Bradley, & O'Leary, 2003; Fried, Byers, et al., 2006; Fried & O'Leary, 2008; Janssen et al., 2011; Janssen et al., 2013). Therefore, these reports often lacked nuanced perspectives that may be relevant to HF in particular. Moreover, with the exception of the MacIver et al. (2008) study, the majority of studies did not acknowledge the influence of factors such as device usage or HF-specific treatments. Therefore, the overarching message from this research is that treatment preferences change over time and with disease progression, are not easily predictable, and are influenced by a number of transient factors and, thus, may not be amenable to elicitation and documentation using the current format of ACP.

Patient, Family, and HCP Experiences with ACP

Themes were generated from the analysis and synthesis of studies that explored the experience of participating in ACP from the perspective of patients, family members, and HCPs. Studies examining experiences with ACP were largely qualitative in nature; however, most were descriptive and did not take a relational approach.

Uncertainty. HF patients, family members, and HCPs identified the uncertainty associated with HF as an influential factor in the ACP process (Ahluwalia & Enguidanos, 2015; De Vleminck et al., 2013; De Vleminck et al., 2014; Dougherty, Pyper, Au, Levy, & Sullivan, 2007; Dunlay, Swetz, Mueller, & Roger, 2012; Evangelista et al., 2012; Fried et al., 2002; Fluur, Bolse, Strömberg, & Thylén, 2014; Greutmann et al., 2013; Jones, Nowels, Sudore, Ahluwalia, & Bekelman, 2015). Uncertainty regarding both diagnosis and prognosis is frequently cited as a barrier to initiating or participating in ACP for both patients and HCPs (Ahluwalia & Enguidanos, 2015; De Vleminck et al., 2013; De Vleminck et al., 2014; Greutmann et al., 2013). HCPs reported that patients are often uncertain or unaware of their diagnosis or prognosis associated with HF, which may contribute to HCPs avoiding or deflecting patient questions that could lead into ACP discussions (Ahluwalia, Levin, Lorenz & Gordon, 2012; Ahluwalia et al., 2013).

Patients reported that their lives are dominated by uncertainty regarding their life expectancy, hopes they could have for recovery or for the future, and how to discuss EOL issues with HCPs and family members (Dougherty et al., 2007; Jones et al., 2015). SDMs also experience uncertainty and described feeling unprepared, overwhelmed, and unsuccessful at predicting the patient's wishes, as well as experiencing stress about decision-making in clinical situations (Evangelista et al., 2012; Fried et al., 2002; Hall, Sanford, & Demi, 2008).

Discomfort discussing ACP and EOL care. HCPs experience discomfort discussing EOL care or death, which hinders their ability to initiate the ACP process (Ahluwalia et al., 2012; Ahluwalia et al., 2013; De Vleminck et al., 2014; Gigon, Merlani & Ricou, 2015; Greutmann et al., 2013; Habal et al., 2011). HCP discomfort is associated with: lack of adequate training or skill, lack of communication strategies, lack of confidence, unfamiliarity with the components of ACP, or an overall aversion to discussing death and other EOL issues (Ahluwalia et al., 2012; Ahluwalia et al., 2013; De Vleminck et al., 2014; Gigon et al., 2015). Cardiologists, in particular, self-rated their EOL communication skills as lower than other specialties and patients also reported lower ratings for the EOL communication skills of their cardiologists, compared to their general communication skills (Ahluwalia et al., 2012; Ahluwalia et al., 2013; De Vleminck et al., 2014; Gigon et al., 2015; Janssen et al., 2011). Wide agreement exists that increased education, training, and provision of communication strategies would improve HCP comfort and increase uptake of ACP conversations (Ahluwalia et al., 2012; De Vleminck et al., 2014; Gigon et al., 2015; Greutmann et al., 2013).

In settings where a trained, non-physician facilitator led ACP conversations, discomfort, and uncertainty were not identified as concerns, because the facilitator was not responsible for prognostication and was experienced with the emotional requirements of ACP conversations (Briggs et al., 2004; Evangelista et al., 2012; Kirchhoff et al., 2010; Schellinger et al., 2011; Song et al., 2005). These findings suggest that designating a specific service or introducing a specific role of a trained facilitator (e.g., HCP comfortable and experienced in ACP) may be beneficial to establishing successful ACP practices.

Time and timing. Four studies reported that HCPs identified lack of time as a barrier to addressing ACP (Ahluwalia et al., 2012; Ahluwalia et al., 2013; Ahluwalia & Enguidanos, 2015; De Vleminck et al., 2014). HCPs also reported challenges with "timing," such as being unable to identify key "moments" to introduce the idea of ACP in a fashion that was comfortable for patients, family members, and themselves. There was also a common belief that others are responsible for initiating ACP conversations, whether that was an HCP from another specialty, the patient, or a family member (Chandar et al., 2016; Gigon et al., 2015). A lack of patient initiation was cited as a barrier to successful ACP discussions between patients and HCPs (De Vleminck et al., 2014; Gigon et al., 2015), which aligns with the idea of readiness and HCPs' assumptions that patients and family members were not ready to embark on ACP conversations (De Vleminck et al., 2014; Greutmann et al., 2013; Habal et al., 2011).

Relationships. The relational aspect of patient autonomy is extremely relevant when examining the practice of ACP, which relies on collaboration among patients, SDMs, and HCPs. Therefore, it is not surprising that including family members in discussions facilitates the ACP process (Fluur et al., 2014; Hall et al., 2008; Shapiro, 2015). Considering that a large component of ACP focuses on appointing an SDM, it is especially important to ensure that SDMs are aware of the requirements of substitute decision-making and are sufficiently included in the exploration of the patient's values, goals, and wishes (Shapiro, 2015). The patient-provider relationship also plays an important role, with a strong, longstanding and trusting relationship with the patient being cited as facilitating ACP (Greutmann et al., 2013). A commonly cited reason that HCPs failed to participate in, or initiate ACP was not wanting to diminish hope, either in patients or family members who often prefer to focus on staying alive rather than thinking about death (Ahluwalia & Enguinados, 2015; De Vleminck et al., 2014; Greutmann et al., 2013). Providers were concerned that discussing EOL care would take away patients' hope (Greutmann et al., 2013), which could threaten the patient-provider relationship (De Vleminck et al., 2014).

Discussion

This review has highlighted a number of themes relevant to the experience of ACP for patients, family members, and HCPs in the context of HF. Despite research efforts and guideline recommendations, studies of ACP interventions are scarce and ACP interventions have failed to become fully integrated into routine HF care. Although occasionally successful when implemented within very specific contexts (i.e., homogenous, North American, white populations), based on the overall low rates of awareness and prevalence of ACP for both patients and HCPs, it is clear that ACP interventions have not sustained significant uptake in the HF population (Ahluwalia et al., 2013; Greutmann et al., 2013; Habal et al., 2011; Tobler et al., 2012b). Unlike other health behaviours that may be amenable to improvement via increased education, the ACP process seems to require more than educational interventions to increase participation rates. Additionally, the literature reviewed has demonstrated that treatment preferences fluctuate and are extremely unpredictable. Yet, numerous studies have focused on aggregating treatment preference data in order to draw conclusions that may be irrelevant for individual patients who experience their illnesses within the context of the relationships and social forces that have shaped their identity. This review has begun to demonstrate the complexity of the ACP process and how the elicitation of patients' and families' values is a challenging and highly circumstantial practice that is unique to the contexts of people's lives.

The majority of qualitative studies have focused on the perspectives and challenges from the viewpoint of the HCP who is frequently a physician and has the ability to 'control' the delivery of ACP (Johnson, Butow, Kerridge, & Tattersall, 2015). The qualitative research in this field has utilized a highly positivist stance (i.e., did not explore relationships or power dynamics) and has followed the individualistic paradigm that is central to quantitative biomedical research. Few studies have examined the experience of HF patients and their families who participate in ACP and whether they view this process as a means to secure their autonomy, or whether they value the individualistic form of autonomy that this practice currently promotes (Johnson et al., 2015; Singer et al., 1998).

Overall, this synthesis of studies identifies two assumptions that have been made on the part of researchers studying ACP within the HF population. These assumptions are:

1. HF patients value individualistic autonomy within the context of their chronic illness and EOL care.
2. HF patients understand ACP and view this practice as a means to support their autonomy within the context of their chronic illness and EOL care.

There are many aspects of this practice that require further exploration and explanation and these assumptions need to be challenged given the low participation in ACP.

Implications for Nursing Practice

The main implication of this work in the context of nursing practice is that ACP is a relational practice that is influenced by the priorities of Western societies, the institutional values of healthcare systems, and the relationships that exist between patients themselves, their SDMs, and their HCPs.

Societal and Institutional Influence

Limited time and increasingly scarce healthcare resources continue to be significant problems in many healthcare systems, as the population of older adults grows and the complexity of patients continues to increase. In addition to advocating for increased time to spend communicating with complex HF patients, modifications in training, compensation mechanisms, and an overall shift away from the dominant paradigm of the biomedical model are needed to support the ACP process.

There is currently no one service, provider, or profession that is solely responsible for the provision of ACP. As nurses are often the mediators of the patient, family, and healthcare team dynamics, they are often responsible for sharing patient priorities with the healthcare team. Therefore, this is an especially important area in which nurses should take on responsibility for supporting ACP, by developing competence and confidence in communicating with patients and families, and learning how to best support SDMs who are making challenging decisions.

Relationship with Others

ACP is an inherently relational process, as it relies heavily on the involvement of at least one SDM (and frequently involves many relationships with family and friends), as well as the involvement of key HCPs. Patients experience EOL decision-making as a social process; they are most concerned about relieving the burden placed on loved ones and are willing to provide surrogates with leeway when making challenging health decisions on their behalf (Johnson et al., 2015; Singer et al., 1998; Sudore & Fried, 2010). This demonstrates the need for nurses to provide ACP in a way that is targeted, not only to individual patients, but also recognizes the role and responsibility of SDMs and accounts for the influence of the social, political, and environmental forces that surround the patient and family.

Relationship with Self

Importantly, this review has demonstrated that individual treatment preferences do not necessarily represent stable core values and, therefore, cannot be accessed or extracted from patients and documented at any given point. This reality likely contributes to the challenges implementing ACP processes, as they currently stand (Janssen et al., 2011; Janssen et al., 2013). The current documentation-focused process also assumes that patients have sufficient self-awareness to clearly articulate very complex values, and sufficient confidence to express these values to family members and HCPs, even if they are in conflict with biomedical and societal norms. Overall, there is an important role for nurses as mediators and translators to support patients in understanding their options and recognizing and articulating their values to the healthcare team in a meaningful way. Additionally, there is a need for nurse researchers to examine the social and relational nature of this complex practice, and how ACP may or may not fit within the individualized model that is currently used in practice (Killackey, Peter, MacIver, & Mohammed, 2019).

Conclusion and Recommendations

Although institutionalized ACP has existed within healthcare systems for more than 25 years, it continues to be a challenge to implement and sustain. This review has added to the field by describing the current state of interventional and exploratory research regarding ACP in the HF population, as well as providing an account of experiences and challenges specific to the ACP process, as a component of chronic illness management. Most significantly, this review has highlighted the social and relational nature of ACP and EOL decision-making for patients living with HF and exposes the current incongruity between the individualistic underpinnings of ACP, as it is often provided in clinical practice, compared to the relational reality experienced by patients, family members, and HCPs, especially cardiovascular nurses.

Recommendations for future research include inquiry into the experience and decision-making process of patients and SDMs who are capable of participating in ACP during the HF trajectory (MacIver et al., 2008). Exploring the perspectives of patients and SDMs regarding the contextual factors that influence the uptake of ACP, the effect of ACP on interpersonal relationships, and the experience of ACP for SDMs would be beneficial to further develop knowledge on this topic and allow nurses to better understand the patient and family experience (Andreassen, Neergaard, Brogaard, Skorstengaard, & Jensen, 2015; Shapiro, 2015).

In conclusion, this review has demonstrated the need for nurse researchers to examine the challenging topic of ACP and the experience of chronically ill patients using theory and methodology that are congruent with the reality of patients and that allows researchers to account for relevant social and relational factors.

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REFERENCES

Ahluwalia, S.C., & Enguidanos, S. (2015). Advance care planning among patients with heart failure: A review of challenges and approaches to better communication. *Journal of Clinical Outcomes*, *22*(2), 73–82.

Ahluwalia, S.C., Levin, J.R., Lorenz, K.A., & Gordon, H.S. (2012). Missed opportunities for advance care planning communication during outpatient clinic visits. *Journal of General Internal Medicine*, *27*(4), 445–451. doi:http://dx.doi.org/10.1007/s11606-011-1917-0

Ahluwalia, S.C., Levin, J.R., Lorenz, K.A., & Gordon, H.S. (2013). "There's no cure for this condition": How physicians discuss advance care planning in heart failure. *Patient Education and Counseling, 91*(2), 200–205. doi:http://dx.doi.org/10.1016/j.pec.2012.12.016

Allen, L.A., Stevenson, L.W., Grady, K.L., Goldstein, N.E., Matlock, D.D., Arnold, R.M., … Spertus, J.A. (2012). Decision making in advanced heart failure: A scientific statement from the American Heart Association. *Circulation, 125,* 1928–1952. doi:10.1161/CIR.0b013e31824f2173

American Heart Association (2015). *Answers by heart: What is heart failure?* Retrieved from https://www.heart.org/-/media/data-import/downloadables/pe-abh-what-is-congestiveheart-failure-ucm_300315.pdf

Andreassen, P., Neergaard, M.A., Brogaard, T., Skorstengaard, M.H., & Jensen, A.B. (2017). The diverse impact of advance care planning: A long-term follow-up study on patients' and relatives' experiences. *BMJ Supportive & Palliative care*, 7(3), 335–340. doi:http://dx.doi.org/10.1136/bmjspcare-2015-000886

Barnato, A.E., Anthony, D.L., Skinner, J., Gallagher, P.M., & Fisher, E.S. (2009). Racial and ethnic difference in preferences for end-of-life treatment. *Journal of General Internal Medicine, 24*(6), 695–701.

Barnes, S., Gardiner, C., Gott, M., Payne, S., Chady, B., Small, N., ... Halpin, D. (2012). Enhancing patient-professional communication about end-of-life issues in life-limiting conditions: A critical review of the literature. *Journal of Pain and Symptom Management*, *44*(6), 866–879. doi:http://dx.doi.org/10.1016/j.jpainsymman.2011.11.009

Briggs, L.A., Kirchhoff, K.T., Hammes, B.J., Song, M.K., & Colvin, E.R. (2004). Patient centered advance care planning in special patient populations: A pilot study. *Journal of Professional Nursing*, *20*(1), 47–58.

Brunner-La Rocca, H. P., Rickenbacher, P., Muzzarelli, S., Schindler, R., Maeder, M.T., Jeker, U., ... Pfisterer, M.E. (2011). End-of-life preferences of elderly patients with chronic heart failure. *European Heart Journal*, 33(6), 752–759. doi:http://dx.doi.org/10.1093/eurheartj/ehr404

Butler, J., Binney, Z., Kalogeropoulos, A., Owen, M., Clevenger, C., Gunter, D., ... Quest, T. (2015). Advance directives among hospitalized patients with heart failure. *JACC: Heart Failure,* 3(2), 112–121.

Canadian Institute for Health Information (2019). Inpatient hospitalization, surgery and newborn statistics, 2017–2018. Retrived from https://www.cihi.ca/en/quick-stats

Chandar, M., Brockstein, B., Zunamon, A., Silverman, I., Dlouhy, S., & Ashlevitz, K., ... Obel, J. (2017). Perspectives of health-care providers toward advance care planning in patients with advanced cancer and congestive heart failure. *American Journal of Hospice and Palliative Medicine*, *34*(5), 423–429. doi:http://dx.doi.org/10.1177/1049909116636614

Chow, J., & Senderovich, H. (2018). It's time to talk: Challenges in providing integrated palliative care in advanced congestive heart failure. A narrative review. *Current Cardiology Reviews*, *14*(2), 128–137.

Connors, A.F., Dawson, N.V., Desbiens, N.A., et al. (1995). A controlled trial to improve care for seriously ill hospitalized patients: The Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatments (SUPPORT). *JAMA, 274*(20), 1591–1598. doi:10.1001/jama.1995.03530200027032

Critical Appraisal Skills Program (CASP) (2019). Qualitative research checklist, "Ten questions to help you make sense of qualitative research." Available at http://www.phru.nhs.uk/casp/critical_appraisal_tools.htm

Davidson, P.M. (2007). Difficult conversations and chronic heart failure: Do you talk the talk or walk the walk? *Current Opinion in Supportive and Palliative Care*, *1*(4), 274–278. doi:http://dx.doi.org/10.1097/SPC.0b013e3282f3475d

De Vleminck, A., Houttekier, D., Pardon, K., Deschepper, R., Van Audenhove, C., Vander Stichele, R., & Deliens, L. (2013). Barriers and facilitators for general practitioners to engage in advance care planning: A systematic review. *Scandinavian Journal of Primary Health Care, 31*(4), 215–226. doi:10.3109/02813432.2013.854590

De Vleminck, A., Pardon, K., Beernaert, K., Deschepper, R., Houttekier, D., Van Audenhove, C., ... Vander Stichele, R. (2014). Barriers to advance care planning in cancer, heart failure and dementia patients: A focus group study on general practitioners' views and experiences. *PloS one*, *9*(1), e84905. doi:http://dx.doi.org/10.1371/journal.pone.0084905

Denvir, M.A., Murray, S.A., & Boyd, K.J. (2015). Future care planning: a first step to palliative care for all patients with advanced heart disease. *Heart, 101*(13), 1002–1007. doi:10.1136/heartjnl-2014-306724

Detering, K.M., Hancock, A.D., Reade, M.C., & Silvester, W. (2010). The impact of advance care planning on end of life care in elderly patients: Randomised controlled trial. *BMJ, 340,* c1345. https://doi.org/10.1136/bmj.c1345

Dev, S., Abernethy, A.P., Rogers, J.G., & O'connor, C.M. (2012). Preferences of people with advanced heart failure—A structured narrative literature review to inform decision making in the palliative care setting. *American Heart Journal*, *164*(3), 313–319. doi:http://dx.doi.org/10.1016/j.ahj.2012.05.023

Dixon, J., Matosevic, T., & Knapp, M. (2015) The economic evidence for advance care planning: Systematic review of evidence. Palliative Medicine, 1–28. https://doi.org/10.1177/0269216315586659

Dougherty, C.M., Pyper, G.P., Au, D.H., Levy, W.C., & Sullivan, M.D. (2007). Drifting in a shrinking future: Living with advanced heart failure. *Journal of Cardiovascular Nursing*, *22*(6), 480–487. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=med5&AN=18090189

Dunlay, S.M., Swetz, K.M., Mueller, P.S., & Roger, V.L. (2012). Advance directives in community patients with heart failure. *Circulation. Cardiovascular Quality & Outcomes, 5*(3), 283–289. doi:http://dx.doi.org/10.1161/CIRCOUTCOMES.112.966036

Eakin, J.M., & Mykhalovskiy, E. (2003). Reframing the evaluation of qualitative health research: Reflections on a review of appraisal guidelines in the health sciences. *Journal of Evaluation in Clinical Practice,* 9 (2), 187–194. https://doi.org/10.1046/j.1365-2753.2003.00392.x

Evangelista, L.S., Motie, M., Lombardo, D., Ballard-Hernandez, J., Malik, S., & Liao, S. (2012). Does preparedness planning improve attitudes and completion of advance directives in patients with symptomatic heart failure?. *Journal of Palliative Medicine*, *15*(12), 1316–1320. doi:http://dx.doi.org/10.1089/jpm.2012.0228

Fluur, C., Bolse, K., Strömberg, A., & Thylén, I. (2014). Spouses' reflections on Implantable Cardioverter Defibrillator treatment with focus on the future and the end-of-life: A qualitative content analysis. *Journal of Advanced Nursing, 70*(8), 1758–1769. doi:10.1111/jan.12330

Formiga, F., Chivite, D., Ortega, C., Casas, S., Ramon, J.M., & Pujol, R. (2004). End-of-life preferences in elderly patients admitted for heart failure. *Quarterly Journal of Medicine, 97*(12), 803–808. doi:10.1093/qjmed/hch135

Fried, T.R., & Bradley, E.H. (2003). What matters to seriously ill older persons making end-of life treatment decisions?: A qualitative study. *Journal of Palliative Medicine*, *6*(2), 237–244. https://doi.org/10.1089/109662103764978489

Fried, T.R., Bradley, E.H., & O'Leary, J. (2003). Prognosis communication in serious illness: Perceptions of older patients, caregivers, and clinicians. *Journal of the American Geriatrics Society*, *51*(10), 1398–1403. doi:10.1046/j.1532-5415.2003.51457.x

Fried, T.R., Bradley, E.H., Towle, V.R., & Allore, H. (2002). Understanding the treatment preferences of seriously ill patients. *New England Journal of Medicine*, *346*(14), 1061–1066. doi:10.1056/NEJMsa012528

Fried, T.R., Byers, A.L., Gallo, W.T., Van Ness, P.H., Towle, V.R., O'Leary, J.R., & Dubin, J.A. (2006). Prospective study of health status preferences and changes in preferences over time in older adults. *Archives of Internal Medicine*, *166*(8), 890–895. doi:10.1001/archinte.166.8.890

Fried, T.R., McGraw, S., Agostini, J.V., & Tinetti, M.E. (2008). Views of older persons with multiple morbidities on competing outcomes and clinical decision-making. *Journal of the American Geriatrics Society*, *56*(10), 1839–1844. doi:10.1111/j.1532-5415.2008.01923.

Fried, T.R., O'Leary, J., Van Ness, P., & Fraenkel, L. (2007). Inconsistency over time in the preferences of older persons with advanced illness for life-sustaining treatment. *Journal of the American Geriatrics Society*, *55*(7), 1007–1014. doi:10.1111/j.1532-5415.2007.01232.x

Fried, T.R., & O'Leary, J.R. (2008). Using the experiences of bereaved caregivers to inform patient-and caregiver-centered advance care planning. *Journal of General Internal Medicine*, *23*(10), 1602–1607. doi:http://dx.doi.org/10.1007/s11606-008-0748-0

Gigon, F., Merlani, P., & Ricou, B. (2015). Advance directives and communication skills of prehospital physicians involved in the care of cardiovascular patients. *Medicine*, *94*(49). doi:http://dx.doi.org/10.1097/MD.0000000000002112

Grant, M.J., & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information and Libraries Journal, 26*(2), 91–108. https://doi.org/10.1111/j.1471-1842.2009.00848.x

Green, B.N., Johnson, C.D., & Adams, A. (2006). Writing narrative literature reviews for peer-reviewed journals: Secrets of the trade. *Journal of Chiropractic Medicine.* doi:10.1016/S0899-3467(07)60142-6

Greutmann, M., Tobler, D., Colman, J.M., Greutmann-Yantiri, M., Librach, S.L., & Kovacs, A. H. (2013). Facilitators of and barriers to advance care planning in adult congenital heart disease. *Congenital Heart Disease*, *8*(4), 281–288. doi:http://dx.doi.org/10.1111/chd.12025

Habal, M.V., Micevski, V., Greenwood, S., Delgado, D.H., & Ross, H.J. (2011). How aware of advanced care directives are heart failure patients, and are they using them?. *Canadian Journal of Cardiology*, *27*(3), 376–381. doi:http://dx.doi.org/10.1016/j.cjca.2010.12.067

Hall, P., Sanford, J.T., & Demi, A.S. (2008). Patterns of decision making by wives of patients with life threatening cardiac disease. *Journal of Family Nursing*, *14*(3), 347–362. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=c8h&AN=106382658&site=ehost-live

Heart and Stroke Foundation (2016). *Report on the Health of Canadians: The Burden of Heart Failure*. Retrieved from https://www.heartandstroke.ca/-/media/pdf-files/canada/2017-heartmonth/heartandstroke\reportonhealth2016.ashx?la=en&hash=91708486C1BC014E24AB4E71B47AEEB8C5EB93E

Heart and Stroke Foundation (n.d.) *Heart failure.* Retrieved from http://www.heartandstroke.ca/heart/conditions/heart-failure

Heffner, J.E., & Barbieri, C. (2001). Effects of advance care education in cardiovascular rehabilitation programs: A prospective randomized study. *Journal of Cardiopulmonary Rehabilitation and Prevention*, *21*(6), 387–391. http://dx.doi.org/00008483-200111000-00008

Janssen, D.J., Spruit, M.A., Schols, J.M., Cox, B., Nawrot, T.S., Curtis, J.R., & Wouters, E.F. (2012). Predicting changes in preferences for life-sustaining treatment among patients with advanced chronic organ failure. *Chest*, *141*(5), 1251–1259. doi:http://dx.doi.org/10.1378/chest.11-1472

Janssen, D.J., Spruit, M.A., Schols, J.M., & Wouters, E.F. (2011). A call for high-quality advance care planning in outpatients with severe COPD or chronic heart failure. *Chest*, *139*(5), 1081–1088. doi:http://dx.doi.org/10.1378/chest.10-1753

Janssen, D.J., Spruit, M.A., Schols, J.M., & Wouters, E.F. (2013). Dynamic preferences for site of death among patients with advanced chronic obstructive pulmonary disease, chronic heart failure, or chronic renal failure. *Journal of Pain and Symptom Management*, *46*(6), 826–836. doi:10.1016/j.jpainsymman.2013.01.007

Johnson, S., Butow, P., Kerridge, I., & Tattersall, M. (2015). Advance care planning for cancer patients: A systematic review of perceptions and experiences of patients, families and healthcare providers. *Psycho-Oncology* doi:10.1002/pon

Jones, J., Nowels, C.T., Sudore, R., Ahluwalia, S., & Bekelman, D.B. (2015). The future as a series of transitions: Qualitative study of heart failure patients and their informal caregivers. *Journal of General Internal Medicine*, *30*(2), 176–182. doi:http://dx.doi.org/10.1007/s11606-014-3085-5

Karimi, M., & Clark, A.M. (2016). How do patients' values influence heart failure self-care decision making?: A mixed methods systematic review. *International Journal of Nursing Studies, 59, 89–104.* doi:10.1016/j.ijnurstu.2016.03.010

Killackey, T., Peter, E., MacIver, J., & Mohammed, S. (2019). Advance care planning with chronically ill patients: A relational autonomy approach. *Nursing Ethics*, 0969733019848031.

Kirchhoff, K.T., Hammes, B.J., Kehl, K.A., Briggs, L.A., & Brown, R.L. (2010). Effect of a disease-specific planning intervention on surrogate understanding of patient goals for future medical treatment. *Journal of the American Geriatrics Society*, *58*(7), 1233–1240. doi:http://dx.doi.org/10.1111/j.1532-5415.2010.02760.x

Kirchhoff, K.T., Hammes, B.J., Kehl, K.A., Briggs, L.A., & Brown, R.L. (2012). Effect of a disease-specific advance care planning intervention on end-of-life care. *Journal of the American Geriatrics Society*, *60*(5), 946–950. doi:http://dx.doi.org/10.1111/j.15325415.2012.03917.x

Kraai, I.H., Vermeulen, K.M., Luttik, M.L.A., Hoekstra, T., Jaarsma, T., & Hillege, H.L. (2013). Preferences of heart failure patients in daily clinical practice: quality of life or longevity?. *European Journal of Heart Failure*, *15*(10), 1113–1121. doi:10.1093/eurjhf/hft071

Lee, M.C., Sulmasy, D.P., Gallo, J., Kub, J., Hughes, M.T., Russell, S., ... Nolan, M.T. (2017). Decision-making of patients with implantable cardioverter-defibrillators at end of life: Family members' experiences. *American Journal of Hospice and Palliative Medicine*, *34*(6), 518–523. doi:http://dx.doi.org/10.1177/1049909116641622

Lum, H.D., & Sudore, R.L. (2016). Advance care planning and goals of care communication in older adults with cardiovascular disease and multi-morbidity. *Clinics in Geriatric Medicine*, *32*(2), 247–260. doi:http://dx.doi.org/10.1016/j.cger.2016.01.011

MacIver, J., Rao, V., Delgado, D.H., Desai, N., Ivanov, J., Abbey, S., & Ross, H.J. (2008). Choices: A study of preferences for end-of-life treatments in patients with advanced heart failure. *The Journal of Heart and Lung Transplantation*, *27*(9), 1002–1007. doi:http://dx.doi.org/10.1016/j.healun.2008.06.002

MacIver, J., Tibbles, A., Billia, F., & Ross, H. (2016). Patient perceptions of implantable cardioverter-defibrillator deactivation discussions: A qualitative study. *SAGE Open Medicine*, *4*, 2050312116642693. doi:http://dx.doi.org/10.1177/2050312116642693

McMahan, R.D., Knight, S.J., Fried, T.R., Sudore, R.L. (2013). Advance care planning beyond advance directives: Perspectives from patients and surrogates. *Journal of Pain and Symptom Management, 46*(3), 355–365. https://doi.org/10.1016/j.jpainsymman.2012.09.006

Pasalic, D., Tajouri, T.H., Ottenberg, A.L., & Mueller, P.S. (2014). The prevalence and contents of advance directives in patients with pacemakers. *Pacing and Clinical Electrophysiology*, *37*(4), 473–480. doi:10.1111/pace.12287

Robinson, C. (2011). Advance care planning: Re-visioning our ethical approach. *Canadian Journal of Nursing Research, 43*(2), 18–37.

Russo, J.E. (2011). Deactivation of ICDs at the end of life: A systematic review of clinical practices and provider and patient attitudes. *The American Journal of Nursing*, *111*(10), 26–35. doi:http://dx.doi.org/10.1097/01.NAJ.0000406411.49438.91

Sadeghi, B., Walling, A.M., Romano, P.S., Ahluwalia, S.C., & Ong, M.K. (2016). A hospital based advance care planning intervention for patients with heart failure: A feasibility study. *Journal of Palliative Medicine*, *19*(4), 451–455. doi:http://dx.doi.org/10.1089/jpm.2015.0269

Schellinger, S., Sidebottom, A., & Briggs, L. (2011). Disease specific advance care planning for heart failure patients: Implementation in a large health system. *Journal of Palliative Medicine, 14*(11), 1224–1230.

Shapiro, S.P. (2015). Do advance directives direct? *Journal of Health Politics, Policy and Law*, *40*(3), 487–530. doi:10.1215/03616878-2888424

Singer, P.A., Martin, D.K., Lavery, J.V., Thiel, E.C., Kelner, M., & Mendelssohn, D.C. (1998). Reconceptualizing advance care planning from the patient's perspective. *Archives of Internal Medicine, 158,* 879–84. doi:10.1001/archinte.158.8.879

Song, M.K., Kirchhoff, K.T., Douglas, J., Ward, S., & Hammes, B. (2005). A randomized, controlled trial to improve advance care planning among patients undergoing cardiac surgery. *Medical Care*, 1049–1053.

Statistics Canada (2017). *Table 13-10-0394-01: Leading causes of death, total population, by age group.* doi:https://doi.org/10.25318/1310039401-eng

Stevenson, L.W., Hellkamp, A.S., Leier, C.V., Sopko, G., Koelling, T., Warnica, J.W., ... Schramm, E.E. (2008). Changing preferences for survival after hospitalization with advanced heart failure. *Journal of the American College of Cardiology*, *52*(21), 1702–1708. doi:10.1016/j.jacc.2008.08.028

Strachan, P.H., Ross, H., Rocker, G.M., Dodek, P.M., Heyland, D.K., & Canadian Researchers at the End of Life Network (CARENET). (2009). Mind the gap: Opportunities for improving end-of-life care for patients with advanced heart failure. *Canadian Journal of Cardiology*, *25*(11), 635–640. https://doi.org/10.1016/S0828-282X(09)70160-6

Sudore, R.L., & Fried, T.R. (2010). Redefining the "planning" in advance care planning: Preparing for end-of-life decision making. *Annals of Internal Medicine, 153*(4), 256–261. doi:10.7326/0003-4819-153-4-201008170-00008

Tajouri, T.H., Ottenberg, A.L., Hayes, D.L., & Mueller, P.S. (2012). The use of advance directives among patients with implantable cardioverter defibrillators. *Pacing and Clinical Electrophysiology*, *35*(5), 567–573. doi:10.1111/j.15408159.2012.03359.x

Teno, J.M., Gruneir, A., Schwartz, Z., Nanda, A., & Wetle, T. (2007). Association between advance directives and quality of end of life care: A national study. *Journal of the American Geriatrics Society, 55*(2), 189–94. doi:10.1111/j.1532-5415.2007.01045.x

Tobler, D., Greutmann, M., Colman, J. M., Greutmann-Yantiri, M., Librach, L.S., & Kovacs, A.H. (2012a). End-of-life in adults with congenital heart disease: A call for early communication. *International Journal of Cardiology*, *155*(3), 383–387. doi:http://dx.doi.org/10.1016/j.ijcard.2010.10.050

Tobler, D., Greutmann, M., Colman, J.M., Greutmann-Yantiri, M., Librach, S.L., & Kovacs, A. H. (2012b). Knowledge of and preference for advance care planning by adults with congenital heart disease. *The American Journal of Cardiology*, *109*(12), 1797–1800. doi:http://dx.doi.org/10.1016/j.amjcard.2012.02.027

Zhang, B., Wright, A.A., Huskamp, H.A., Nilsson, M.E., Maciejewski, M.L., Earle, C.C., ... Prigerson, H.G. (2009). Health care costs in the last week of life: Associations with end-of-life conversations. *Archives of Internal Medicine*, *169*(5), 480–488. doi:10.1001/archinternmed.2008.587

Cardiovascular Disease Prevention: A Scoping Review of Healthy Eating and Physical Activity Among Indigenous Peoples in Canada

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Abstract

Background: *Cardiovascular disease is a growing health issue among Indigenous peoples in Canada. In addition, it appears that cardiovascular risk factor modification is lacking in this population.*

Purpose: *The objective of this scoping review is to present a comprehensive analysis of the literature regarding dietary and physical activity behaviours among Indigenous Canadian peoples over the last ten years.*

Methods: *This scoping review was conducted using the methodology of Arksey and O'Malley (2005).*

Results: *Thirty studies examining the dietary and/or physical activity behaviours of Indigenous peoples were included in the review. The food transition among Indigenous peoples is reflected by a decrease in the traditional diet, resulting in decreased nutritional quality. It appears that most Indigenous peoples are engaged in regular physical activity, despite physical, economic, and political barriers.*

Conclusions: *Although these results corroborate earlier findings, additional nursing studies are needed to explore strategies for cardiovascular risk factor reduction in Canadian Indigenous peoples.*

Key words: lifestyle, Indigenous peoples, physical activity, nutrition

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Key Highlights

- The risk of dying from CVD is higher for Indigenous peoples than for the rest of the Canadian population.
- The reduction in traditional food consumption seems to coincide with a greater consumption of unhealthy market foods.
- Studies on physical activity suggest that the Indigenous peoples are active; however, the evaluation tools are inconsistent.
- The determinants of health, including the cultural and historical context, as well as individual risk factors, must be considered in developing strategies to reduce the risk for CVD in Indigenous peoples

In Canada, over 1.6 million people self-identify as Indigenous (Statistics Canada, 2018). According to the Constitution Act (1982), the term *Indigenous* defines three distinct groups: First Nations, Inuit, and Métis (Government of Canada, 1982).[1] Health disparities between Indigenous and non-Indigenous peoples have persisted for years (Smylie & Firestone, 2016). For example, cardiovascular disease (CVD) rates are almost 50% higher among First Nations and Métis compared to the general Canadian population (Public Health Agency of Canada, 2016) and health concerns about CVD are also emerging in Inuit communities (Hu, Singh, Kenny, & Chan, 2019). Moreover, compared to non-Indigenous people, the risk of dying from CVD is 30% higher among First Nations men and 76% higher among First Nations women (Tjepkema, Wilkins, Goedhuis, & Pennock, 2012). While the social determinants of

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[1] The term "Indigenous peoples" is a collective noun for First Nations, Métis and Inuit and as much as possible, the authors' use the more specific term. The term "Indigenous peoples" is not used interchangeably with First Nations. When applicable, it is noted whether referenced First Nations people are living on community (reserve) or off community.

health play a crucial role in these disturbing statistics, traditional cardiovascular risk factors are also critically important (Anand et al., 2001).

Nurses play an important role in CVD prevention and advocacy; therefore, they must be prepared to deliver quality care to the Indigenous population (Lanuza, Davidson, Dunbar, Hughes, & De Geest, 2011; Tobe, Maar, Roy, & Warburton, 2015). Lifestyles,which are often grounded in the determinants of health, appear to be at the root of Indigenous Canadians' health issues. Although the overall definition of healthy lifestyles may vary, most would agree that physical activity and healthy diet are key factors in preventing CVD and its associated complications (World Health Organization, 2004). Therefore, this scoping review focuses on the existing evidence related to dietary and physical activity behaviours among Indigenous peoples in Canada.

Background

The lifestyle related CVD risk factors of physical activity and diet cannot be addressed without consideration of the related CVD risk factors and the broader context of the social determinants of health. For example, in their Study of Health Assessment and Risk Evaluation in Aboriginal Peoples (SHARE-AP), published in *The Lancet*, Anand et al. (2001) concluded that both CVD risk factors and social determinants of health to play a crucial role in CVD statistics.

Social Determinants of Health

To reduce CVD risk factors in Indigenous peoples, health professionals must be aware of the social determinants of health, such as income, education, employment, living conditions, housing, colonization, and access to culturally competent health services (Tobe et al., 2015). Culture also determines health because of its historical roots and link to social conditions and politics (Joncas & Roy, 2015). Nurses must take a leadership role in shaping health care and social policy and help to reduce the global burden of CVD by advocating for cardiovascular health in vulnerable communities (Lanuza et al., 2011).

Cardiovascular Risk Factors

Although the cardiovascular health of Indigenous peoples is impacted by all CVD risk factors, diabetes and obesity are closely linked to dietary patterns and physical activity. The prevalence rates for diabetes among First Nations living off-community is 1.9 times higher than non-Indigenous people (12.7% vs 6.8%) and the prevalence among Métis (9.9%) is 1.5 times higher than non-Indigenous people (Public Health Agency of Canada, 2018). A large Canadian study (n = 2,802,845) predicted that about 80% of First Nations peoples will be diagnosed with diabetes in their lifetime (Turin et al., 2016). The recent Diabetes Canada guidelines assert that diabetes is generally diagnosed at an earlier age and complications are more frequent among Indigenous peoples, hence the relevance of assessing risk factors of diabetes (e.g. unhealthy diet, obesity or inactivity) from an early age (Crowshoe et al., 2018).

Obesity (BMI ≥ 30 kg/m^2) is also a major problem because obesity rates are higher among First Nations living off-community (28%), Métis (24%), and Inuit (28%), compared to non-Indigenous people (16%; Batal & Decelles, 2019). Unfortunately, the general trend among Canadians is an overall increase in obesity rates (Batal & Decelles, 2019). Furthermore, it is well documented that obesity is associated with CVD (Guh et al., 2009); therefore, interventions combining healthy diets and physical activity are recommended for CVD prevention (Tobe et al., 2015).

Diet & physical activity. To our knowledge, the only recent Indigenous related Canadian review of diet and physical activity focused solely on the Inuit peoples (Akande, Hendriks, Ruiter, & Kremers, 2015). Akande et al. (2015) systematically reviewed factors influencing dietary and physical activity behaviours (n=45 articles). Age and gender were found to be factors influencing the consumption of traditional food or market food. However, regarding physical activity, the authors reported inconsistancies with assesment methodology. Young and Katzmarzyk (2007) drew the same conclusion in their review of the physical activity patterns of Indigenous Canadian peoples, the determinants of said patterns, and their consequences. Willows (2005) conducted the only published review of Canadian Indigenous peoples healthy diets, intending to provide an overview of the state of knowledge and research gaps about the determinants of healthy diet among Indigenous peoples.

To date, researchers have given little attention to six themes related to the determinants of healthy eating in Aboriginal peoples in Canada, identified by Willows (2005): 1) the relationship between food beliefs and eating practices; 2) the link between the sensory properties of traditional and market foods and food choices; 3) the impact of Indigenous values (i.e., traditions of cooperation, sharing, and reciprocity) regarding food insecurity and a validated scale for this population; 4) perceptions and body image; 5) the influence of environment on food choices; and 6) the interaction of the determinants of health relative to food. Notably, Willows (2005) did not discuss the cultural aspect of Canadian dietary guidelines. The Canadian government developed Canada's Food Guide – First Nations, Inuit, and Métis in 2010, based on *Canada's 2007 Food Guide* (Government of Canada, 2010). In 2019, the *Food Guide* was revised to include the Indigenous peoples (Health Canada, 2019). For example, it now mentions that eating traditional food improves diet quality among Indigenous peoples (Health Canada, 2019). The *Food Guide* has also been translated into many languages, including nine Indigenous languages (Government of Canada, 2019).

Canada's current *Dietary Guidelines* address the determinants of health, as well as health inequities about healthy food choices (Health Canada, 2019). The Canadian Government is also currently working with Indigenous partners to support the development of healthy eating tools (Government of Canada, 2018). Based on the lack of current evidence and the Canadian *Food Guide*, we determined that it was relevant to undertake a scoping review of the literature related to dietary behaviours in Indigenous peoples over the last ten years. Since dietary and physical activity behaviours are closely linked in CVD prevention, it is of interest to include both of these factors in the review, and also because it builds on Akande et al.'s (2015) review of the Inuit peoples.

Aim and Methods

The present study offers a review of the literature regarding the dietary and physical activity behaviours of Indigenous Canadians over the last ten years. This scoping review aims to identify research gaps in the existing literature. It is rooted in the methodological framework of Arksey and O'Malley (2005), which includes six stages: 1) identifying the research question, 2) identifying relevant studies, 3) study selection, 4) charting the data, 5) collating, summarizing and reporting the findings, and 6) consultation exercice (optional).

Stage 1: Identifying the Research Question

This scoping review addressed the following underlying research question: *What are the extent of, nature of, and gaps in the literature related to the dietary behaviours and physical activities of Indigenous Canadians?* "Dietary behaviours" refer to habitual food choices, frequency of consumption, and quantity absorbed. The Canadian Society for Exercise Physiology (2017) defines physical activity as "any bodily movement produced by skeletal muscles that results in energy expenditures and increases heart rate and breathing. (par. 2)"

Stage 2: Identifying Relevant Studies

The search strategy used in a scoping review must be as rigorous as that of a systematic review (Arksey & O'Malley, 2005). Thus, we searched for relevant studies based on keywords regarding nutrition and physical activity among Indigenous Canadians. Our search included the terms: (First Nations OR Aboriginal OR Native OR Indians OR Inuit OR Metis) AND (Canada OR Canadian) AND (Lifestyle OR Healthy Lifestyle) OR (Exercise) OR (Food OR Feeding Behaviours OR Diet OR Eating Habit). We then consulted the *Medline*, *Pubmed*, *PsychInfo*, *CINHAL*, and *Sport Discus* data bases using various combinations of these keywords. We also limited the search strategy to qualitative and quantitative original studies on teenagers and adults (≥ 12 years), published in French and English, between June 2007 and June 2017. Studies completed before 2007 were not included, as they have been covered in previous literature reviews (Willows, 2005; Young & Katzmarzyk, 2007). Additional opinion pieces, reference works, and unpublished reports were also consulted. Thus, we excluded all studies on nutrition and physical activity associated with intervention, prevention, and health promotion programs, as well as studies pertaining to questionnaire validation, because they did not meet the research objective. Furthermore, articles on food insecurity, children (<12 years), or pregnant women were also excluded because these studies involved distinct Indigenous groups and specific, well-documented issues.

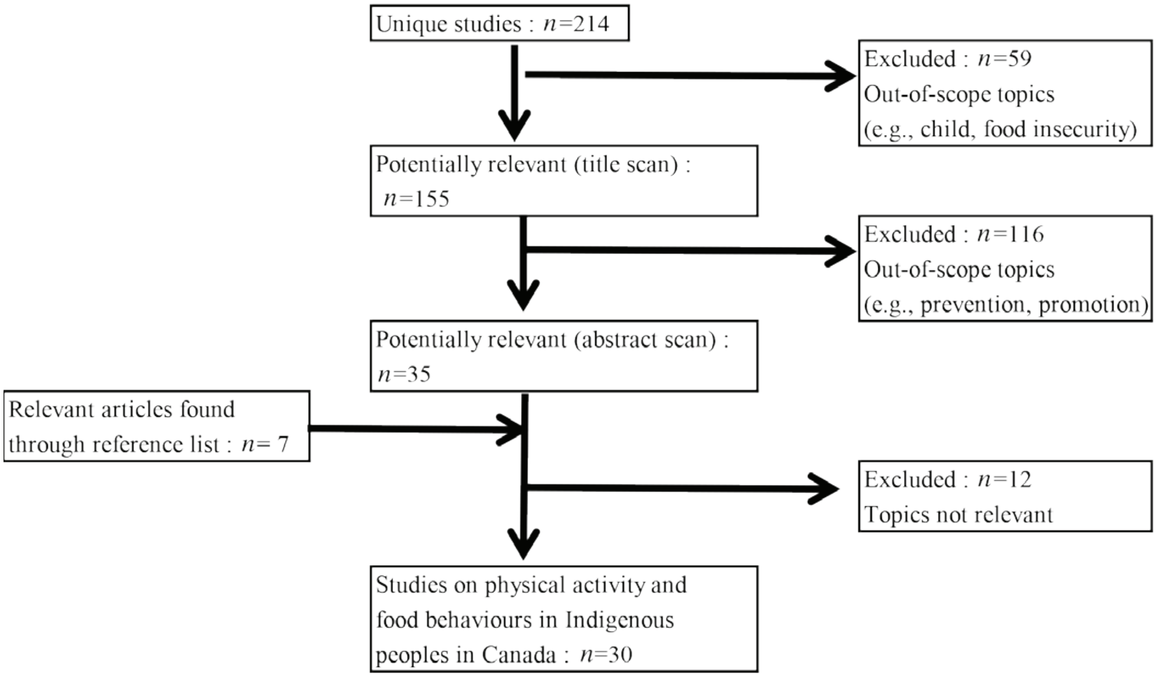

Figure 1. Flow Chart of Included and Excluded Studies.

Table 1. Overall Results of Scoping Review (*n*=30)

Year	First author	QUAN Design	Location	Indigenous peoples			Diet	PA
				FN	M	I		
2007	Kuhnlein	√	LA, NU, NT, YT	√	√	√	√	
2007	Sharma	√	ON	√			√	
2008	Garriguet	√	AB, BC, MB, ON, SK	√	√	√	√	
2008	Ho	√	ON	√			√	√
2009	Coble	MM	BC	√				√
2009	Sharma	√	NT			√	√	
2010	Erber (a)	√	NT			√	√	
2010	Erber (b)	√	NT			√	√	
2010	Hopping (a)	√	NT			√		√
2010	Hopping (b)	√	NU			√		√
2010	Hopping (c)	√	NU			√	√	
2010	Hopping (d)	√	NU			√	√	
2010	Mead (a)	QUAL	NU			√	√	
2010	Mead (b)	√	NU			√	√	
2010	Quadir	√	Canada	√	√	√	√	
2010	Sharma	√	NU			√	√	
2011	Findlay	√	Canada	√	√	√		√
2011	Sheikh	√	IN, NU, NUN			√	√	
2012	Foulds	√	BC	√				√
2012	Zotor	√	NT			√	√	
2013	Bruner (a)	MM	SK	√			√	
2013	Bruner (b)	MM	ON	√				√
2013	Sharma	√	NU			√	√	
2013	Sheehy	√	NU			√	√	
2014	Kolahdooz (a)	√	NT			√	√	
2014	Sheehy	√	NU			√	√	
2015	Akande	SR	Canada			√	√	√
2015	Sheehy	√	NU			√	√	
2017	Batal	√	BC, AB, MB, ON	√			√	
2017	Ryan	√	Canada		√			√
Total	30	25	-	11	5	23	23	9

Note. QUAN design = quantitative design ; MM = mixed methods ; QUAL = qualitative ; SR = systematic review ; PA = physical activity ; FN = First Nation ; M = Métis ; I = Inuit.

Location: AB= Alberta ; BC= British Columbia ; IN= Inuivialuit ; LA= Labrador ; MB= Manitoba ; NU= Nunavut ; NUN= Nunatsiavut ; ON = Ontario ; SK= Saskatchewan; NT= Northwest Territories ; YT= Yukon.

Stage 3: Study Selection

This stage is an iterative process consisting of a literature search, a redefinition of search strategies, and a review of selected articles (Levac, Colquhoun, & O'Brien, 2010). Some have suggested that a multidisciplinary team is essential at this point to ensure a rigorous process (Levac et al., 2010). Therefore, perspectives from nursing, physical sciences, and psychology characterize this scoping review. As the flow diagram (see Figure 1) indicates, following the removal of duplicates, a total of 214 studies were selected by two team members. First, the titles of articles that did not meet the inclusion criteria were removed, reducing the sample to 155, at which point the same procedure was applied to the abstracts. At this stage, the remaining 35 articles were reviewed independently by two team members. Seven additional articles were added from these studies' references lists. The two evaluators reached an 84% agreement for all 42 potential texts. Differences in opinion were discussed as a team before arriving at a consensus. At the end of the process, 30 articles were retained (see Table 1).

Stage 4: Charting the Data

Data charting corresponds to data extraction during a systematic review (Arksey & O'Malley, 2005). The approach resembles that of the narrative review but involves a more global perspective. Toward this end, the researchers designed a table containing the following details: author, year of publication, sample size, method, and key findings (see Tables 2 & 3).

Stage 5: Collating, Summarizing, and Reporting the Findings

Alhough the purpose of this stage involves analyzing the findings, it should be noted that, unlike in a systematic review, the objective of the scoping review is neither to evaluate the quality of the studies nor to determine if their findings can be generalised (Arksey & O'Malley, 2005).

Stage 6: Consultation Exercise

According to Arksey and O'Malley (2005), this stage is optional; however, according to Levac et al. (2010) it is essential. In this stage, researchers consult with stakeholders to validate the work of the scoping review and conduct a knowledge transfer. Accordingly, we discussed of dietary and physical activity behaviours with five Indigenous and non-Indigenous health professionals (i.e., four nurses and one nutritionist) in an Indigenous community, enabling them to validate the context of the findings. According to Levac et al. (2010), the knowledge gained from these findings can be disseminated via university nursing courses and scientific publications, as well as through popularizing science and synthesis presentations among Indigenous communities. We anticipate that our findings will be of interest to decision-makers, clinicians, and other researchers.

Results

Table 1 provides an overview of the 30 articles retained for this scoping review. Ten of the 30 studies were published in 2010 and most utilized a quantitative design (*n*=25). Four studies did not distinguish their subjects' ethnicity (i.e., First Nations, Métis, or Inuit). Three studies considered Canada as a whole, but none were specific to eastern Canada (i.e., Quebec and the Maritime provinces). A total of 23 studies examined dietary behaviours, and two of these included both dietary and physical activity behaviours. A single study focused on the Métis, seven on the First Nations, and 18 on the Inuit.

Tables 2 and 3 contain detailed descriptions of the 30 articles. The selected studies are divided into two sections based on subject: dietary and physical activity behaviours, or a combination. Most studies were conducted in Indigenous communities versus urban areas. With the exception of three studies, which neglected to clarify the participants' sexes, the average percentage of female participants was 73%. The mean of female participation for articles about dietary was 75% and 71% for the physical activity behaviours. Observations regarding the main findings of Tables 2 and 3 are presented in the following section.

Dietary Behaviour

All studies on dietary behaviours observed the emergence of the nutrition transition of the Indigenous peoples over the past decade. Nutrition transition for Indigenous peoples is defined as the balance of traditional foods to market foods related to socio-economic, cultural, and environmental dimensions (Halseth, 2015). Therefore, this section focuses on the intimately intertwined geographical, traditional food consumption, and socio-economic factors.

First, the consumption of traditional foods (e.g., caribou, fish, etc.) varied based on the location of study. While Ho et al. (2008) reported that 54% of the respondents in remote Ontario communities complemented their diets with the products of hunting and fishing, only 5% of respondents in a semi-remote community adopted this practice. Conversely, others reported that traditional foods were rarely consumed in both remote and semi-remote Ontario communities (Sharma et al., 2007). Regarding food consumption among the Inuvialuit, traditional foods were not on the list of the ten most eaten foods (Erber et al., 2010a). Traditional foods were consumed, on average, 1.6 times a day, compared with foods of low nutritional quality, which were consumed, on average, 9.2 times a day (Erber et al., 2010b). According to a study conducted among three Indigenous peoples communities in northern Canada (*n*=3,329), 22% of participants consumed traditional foods (Kuhnlein, Receveur, Soueida, & Berti, 2007). Those who favoured traditional foods appeared to be older men (Akande et al., 2015; Hopping et al., 2010c; Sheikh, Egeland, Johnson-Down, & Kuhnlein, 2011). Barriers to a traditional diet included the high cost of

Table 2. Descriptive Summary of Articles Meeting the Inclusion Criteria for Diet (*n*=21)

First author (year)	Sample	Method	Major findings *
Kuhnlein (2007)	*n*=3,329	24 h recall	Only 22% consume TFs. Consumption of fibre and vitamin E are below recommended levels.
Sharma (2007)	*n*=129	24 h recall	TFs are rarely consumed. The average daily portions of dairy products and FVs are below recommended levels.
Garriguet (2008)	*n*=6,224	24 h recall	Indigenous women consume significantly fewer dairy products than non-Indigenous women.
Sharma (2009)	*n*=101	24 h recall	Low consumption of fibre; vitamins A, C and E; folate and calcium are reported. Women consume lower amounts of vitamin D and iron than men. FVs are eaten less than once a day.
Erber (2010a)	*n*=64	24 h recall	Fibre intake is below the recommended levels. Caribou is the most consumed TF.
Erber (2010b)	*n*=230	QFFQ	The daily frequency of consumption of FVs is 1.6 ± 15. Women consume FVs 0.6 times more often than men. The mean consumption of TF is 1.6 ± 1.7.
Hopping (2010c)	*n*=211	QFFQ	Participants past the age of 50 consume a larger amount of TF. They eat market foods three times more frequently than FV and TF combined.
Hopping (2010d)	*n*=75	24 h recall	The daily intake of fibre and vitamins B6, D and E is below recommended levels. Caribou is the most consumed TF.
Mead (2010a)	*n*=43	Interviews	The nutrition transition is explained by the availability of foods high in fat and sugar and to changing Inuit values. The high cost of hunting equipment, lack of time and loss of traditional knowledge are all barriers to healthy eating.
Mead (2010b)	*n*=266	AIQ	The frequency ratio of unhealthy food acquisition versus healthy foods acquisition is 2.9 (2.3) in the 30-day recall period.
Quadir (2010)	*n*=35,000	FVIQ	Only 15% of the Indigenous peoples consume ≥5 portions of FVs a day.
Sharma (2010)	*n*=83	24 h recall	The daily intake of fibre and vitamins A, E and folate is below recommendations. Women consume less iron than men.
Sheikh (2011)	*n*=4,524	24 h recall	Less TF is consumed and a rise in the consumption of market foods is reported. Women consume significantly less TF.
Zotor (2012)	*n*=230	QFFQ	Market food is mainly consumed. Caribou is the only traditional meat in the list of 30 most eaten foods.
Bruner (2013a)	*n*=39 QUAN + 19 QUAL	24h recall Ethno	The portions of FVs and milk are below recommended levels, but salt, fat, sugar and oil exceed recommendations. Young people prefer market food over TF due to lack of exposure. The most consumed TF is moose meat.
Sharma (2013)	*n*=211	QFFQ	Only 10% meet the recommendations for fibre consumption. Vitamin D and calcium are below recommended levels.
Sheehy (2013)	*n*=211	QFFQ	Caribou is the most consumed traditional meat. Consumption of FVs is low, but almost 75% of Inuit peoples eat fruits.
Kolahdooz (2014a)	*n*=213	QFFQ	Vitamin B and sodium are consumed in excess, but vitamins A, C, D and E and fibre are below recommended levels.
Sheehy (2014)	*n*=175	QFFQ	Caribou is the only TF on the list of 30 most eaten foods, and there is low consumption of FVs.
Sheehy (2015)	*n*=208	QFFQ	The quantity of TF consumed daily is 418 ± 342 grams. The average intake of vitamin E and fibre is below recommended levels. Those who do not consume TF have vitamin A, magnesium and potassium deficiencies.
Batal (2017)	*n*=3,700	24h recall	Highly-processed foods account for 53.9 % of calories.

Note. TF = Traditional foods ; FN = First Nation ; FVs = Fruit and vegetables ; QFFQ = Quantitative Food Frequency Questionnaire ; AIQ = Adult Impact Questionnaire ; FVIQ = Fruit and Vegetable Intake Questionnaire ; QUAN = Quantitative ; QUAL = Qualitative ; Ethno = Ethnography.
**These findings are based on the 2007 national Canada Food Guide. The newly released version has reduced the four food groups to three (wholegrains, FV and proteins).*

Table 3. Descriptive Summary of Articles Meeting the Inclusion Criteria for Physical Activity (*n*=9)

First author (year)	Sample	Method	Major findings
Ho (2008)	*n*=343	24 h recall Accelerometry	Two-thirds of the participants do not engage in daily high-intensity PA. Participants report a diet high in fat and sugar and low in fibre. In remote communities, a traditional diet completes the menu (54% vs 5%). Women are more likely to use healthy cooking methods.
Coble (2009)	*n*=53 QUAN + 12 QUAL)	GLTEQ Focus group	Women are less active than men. A holistic approach involving body, spirit and community is linked to the practice of PA. More personal barriers (e.g., finances) than facilitators were evoked regarding the practice of PA. The participants want to see more PA planned around indigenous cultural aspects.
Hopping (2010a)	*n*=196	IPAQ	Inuvialuit participants spend an average of 3,709 ± 3,519 MET-min each week walking or engaging in moderate to high intensity activities. This corresponds to the highest level of PA on the IPAQ.
Hopping (2010b)	*n*=218	IPAQ	Nunavummiut participants spend an average of 3,801 ± 2256 MET-min each week walking or engaging in moderate to high intensity activities. This corresponds to the highest level of PA on the IPAQ.
Findlay (2011)	*n*=132,908	Self-Declaration	Off-community First Nations people and the Métis are more likely than non-Indigenous peoples to be physically active in their leisure time (37% and 39% vs 30%). There is no significant difference among the Inuit.
Foulds (2012)	*n*=882	HPAPQ	A significant proportion of Indigenous women have been identified as physically active compared with men. There is no major difference regarding the practice of moderate activity, although the percentage of moderately active men is almost twice that of women.
Bruner (2013b)	*n*=58 QUAN + 19 QUAL	MAQ Ethnography	The youngest participants are the most active. The PAs most reported are walking and household tasks. Barriers to PA include lack of time, fatigue, lack of child care, cold weather and physical safety.
Akande (2015)	*n*=45 articles	Based on PRISMA guidelines	There are many inconsistencies regarding PA. Age and gender are two key factors in the consumption of traditional and market foods. Smoking and alcohol consumption are reported as factors likely to negatively affect dietary habits and quality of nutrition.
Ryan (2017)	*n*=5,810	Questionnaire	Slightly over half of the Métis engage in ≥3 hours of PA a week, although women are significantly less active than men. Increased age equals less PA, and those who take part in cultural events are more active.

Note. PA = Physical activity ; QUAN = Quantitative ; QUAL = Qualitative ; GLTEQ = Godin Leisure Time Exercise Questionnaire ; IPAQ = International Physical Activity Questionnaire ; MAQ = Modifiable Activity Questionnaire ; HPAPQ = Healthy Physical Activity Participation Questionnaire.

hunting equipment, lack of time and information, loss of traditional knowledge, and an increased preference for market foods (Bruner & Chad, 2013a; Mead, Gittelsohn, Kratzmann, Roache, & Sharma, 2010a).

Results also showed that the transition from a traditional diet to a market diet impacts the nutritional well-being of Indigenous peoples. Six studies pointed to a low consumption of fruits and vegetables, often less than one portion a day (Erber et al., 2010b; Quadir & Akhtar-Danesh, 2010; Sharma et al., 2009; Sheehy, Kolahdooz, Roache, & Sharma, 2014; Sheehy, Roache, & Sharma, 2013; Zotor, Sheehy, Lupu, Kolahdooz, Corriveau, & Sharma, 2012). Moreover, Garriguet (2008) reported that Indigenous men consumed significantly less dairy products than non-indigenous men. Other findings revealed that the general consumption of the dairy food group was below recommendations (Bruner & Chad, 2013a; Sharma et al., 2007).

Researchers have also reported higher calorie consumption among Indigenous than non-Indigenous Canadians (Sharma et al., 2007; Sharma, Hopping, Roache, & Sheehy, 2013). In addition, First Nation peoples in four Canadian provinces (*n*=3,700) reportedly obtained 50% of their daily calories from highly-processed foods, which provide fewer micro-nutrients, and other nutrients, such as fibre, iron, and vitamin A (Batal et al., 2017). Therefore, it is not surprising that a number of studies have indicated that micro-nutrients, and other nutrients such as fibre, vitamin E and calcium, were below recommended levels (Bruner & Chad, 2013a; Eber et al., 2010b; Hopping et al., 2010d; Kolahdooz et al., 2014a; Kuhnlein et al., 2007; Sharma et al., 2009; Sharma et al., 2013; Sheehy, Kolahdooz, Roache, & Sharma, 2015).

Finally, several researchers identified iron deficiencies in Indigenous women in Nunavut and the Northwest Territories and linked these deficiencies to women's low consumption of traditional foods in comparison to men (Sharma, Cao, et al., 2010; Sharma et al., 2009). Batal et al. (2017) quantified the association between highly-processed foods and the quality of the First Nations peoples' diets and found that the reduced consumption of traditional foods was associated with greater consumption of market foods, including highly-processed products. Thus, the nutrition transition to diet of highly-processed foods appears to offer both a higher number of calories and less nutritional value, which may have a significant impact on CVD risk.

Physical Activity Behaviour

The only study conducted specifically among the Métis peoples in Canada (*n*=5,810) indicates that slightly more than half of these peoples engage in physical activity three hours or more per week (Ryan, Cooke, Kirkpatrick, Leatherdale, & Wilk, 2017). Based on two studies conducted among the Inuit in Nunavut (*n*=218; Hopping, Erber, Mead, Roache, and Sharma, 2010b) and the Northwest Territories (*n*=196; Hopping, Erber, Beck, De Roose, and Sharma, 2010a), researchers reported that most participants (89% & 89%) engaged in moderate-intensity physical activity each week.

According to a study by Findlay (2011), conducted among off-community Indigenous Canadians, First Nations members and Métis were more likely to be active in their leisure time (37% and 39% respectively) than non-Indigenous people (30%). However, the percentage of active Inuit individuals (31%) was not significantly different compared with non-Indigenous people (Findlay, 2011). In all groups combined, Indigenous men appeared to be more active than Indigenous women (Coble, Rhodes, & Higgins, 2009; Ryan et al., 2017). While two studies pointed to increased age as an impediment to physical activity (Bruner & Chad, 2013b; Ryan et al., 2017), a third study found no significant link between the two (Foulds, Bredin, & Warburton, 2012). Several barriers to physical activity were also discussed, including finances, absence of infrastructure, lack of time or help for child care, fatigue, cold weather, and an unsafe environment (Bruner & Chad, 2013b; Coble et al., 2009). In summary, despite some barriers to physical activity, Indigenous peoples appear to be relatively active. However, it is important to note that eight of the nine studies included in this review used only self-report measures of physical activity (i.e., subjective methods), where participants tend to under or overestimate their patterns of physical activity (Prince et al., 2008). Only one study used an objective method (i.e., accelerometer; Ho et al., 2008).

Discussion

The main objective of this scoping review was to summarise the literature related to dietary and physical activity behaviours among Indigenous Canadians. The results have addressed the specific research question focused on identifying the extent, nature, and gaps in this literature. Therefore, based on these results, the following discussion includes recommendations related to improving diet and physical activity in the Indigenous population, as well as study limitations and recommendations for research and, practice.

Recommendations for Dietary Behaviour

Regarding studies on dietary behaviour, findings highlight the nutrition transition of Indigenous Canadians, evidenced by the reduced consumption of traditional foods. One notable avenue for preventing CVD among Indigenous people is to stress the value of traditional foods, since these would replace less nutritional market foods at a lower cost (Mead et al., 2010a). The influence of traditional foods consumption is multifactorial, as presented in a study conducted within three Cree communities, where the individual, family, community and environment influenced the consumption of traditional foods (Gaudin, Receveur, Walz, Girard, & Potvin, 2014). In addition, Indigenous peoples place an important symbolic and identity value on traditional food; it is a means of cultural expression, an anchor to culture and personal well-being, an essential way to promote holistic health, and a direct link between the environment and human health (Institut national de santé publique du Québec, 2015).

The Indigenous resurgence paradigm, defined as a spiritual revolution for Indigenous who can find their identity and dignity by re-establishing connections to the land (Alfred, 2015), encourages the return to traditional food (Paquet, 2016). Strategies to support this paradigm may also reduce nutrition transition. For example, in areas where hunting, fishing, and harvesting are more difficult, community garden initiatives that respect traditional food principles should be considered (Paquet, 2016). Such a proposal might encourage, most notably, the consumption of fruits and vegetables, a food group that tends to be neglected in Indigenous communities, and in Canada as a whole (Colapinto, Graham, & St-Pierre, 2018). Another intervention to re-emphasize the value of traditional foods could be fiscal strategies (e.g., 20% discounts on healthy food), combined with nutrition education (Gwynn et al., 2019).

Recommendations for Physical Activity Behaviour

In terms of the Indigenous community's holistic view of health, the four spheres of influence (i.e., physical, emotional, mental, and spiritual) and the connection to family, community, and the land must be taken into account when developing strategies to increase physical activity (Dahlberg, Dahlberg, Hamilton, Hamid, & Thompson, 2018; Sport for Life Society, 2019). The barriers to physical activity mentioned in the studies reviewed were specifically linked to environments, both physical (e.g., climate and lack of infrastructure) and economic (e.g., relative cost of services). Specific to Indigenous women, in a study of Cree womens's beliefs and attitudes towards physical activity, Bruner and Chad's (2013b) findings included environmental and economic factors, but also highlighted the importance of safety, child care, women only, and age specific programming considerations.

Strengths and Limitations

A scoping review is a strong methodology because it is flexible and considers literature of various designs. The possibility to incorporate both qualitative and quantitative studies provides a better understanding of the social meanings associated to diet and physical activity. According to O'Brien et al. (2016), scoping reviews are beneficial because they focus on the state of research activity rather than the quality of literature. In only a few decades, Indigenous lifestyles have changed, and it is important to have contemporary evidence of the current status to be able to optimise cardiovascular health promotion and disease prevention. The main limitation of this study was the focus on studies published in peer-reviewed journals and the exclusion of grey literature. As well, we may have missed some relevant studies because some Indigenous journals or organization publications are not available on the database. It is relevant to specify that 15 of the studies included in the scoping review were conducted by the same team of researchers collecting preliminary data for a nutritional intervention program titled Healthy Foods North in Canada's northern communities (Sharma, Gittelsohn, Rosol, & Beck, 2010). The project targeted women in particular, as they were considered primarily responsible for meal preparation, hence the high prevalence of women in the samples.

Recommendations for Research

Overall, most studies (*n*=25) identified in this scoping review used a quantitative approach. Only one study used a qualitative approach; one was a systematic review ; and three used a mixed approach, which provides both qualitative and quantitative data. To address Indigenous Canadians' health inequalities, such methodology supports partnerships in the community, offers greater autonomy, and makes it possible to expose injustices (Plano, Clark, & Ivankova, 2016). Mixed methods results may provide a better understanding of this inequity, and triangulation may bring a more powerful argument to the results.

This picture of the last ten years highlights the evolution of the methodologies used to evaluate dietary habits. In line with this issue, the present point to the use, in 2010, of the Quantitative Food Frequency Questionnaire (QFFQ), developed specifically for the Inuit (Pakseresht & Sharma, 2010) and adapted for the Indigenous peoples of Alaska (Kolahdooz, Simeon, Ferguson, & Sharma, 2014b). Researchers must inquire about the importance of breakfast, traditional dietary behaviours in an urban context, and the number of meals consumed each day. This scoping review revealed that there is a lack of theoretical knowledge on these topics. Another promising approach would be to build on the work of Mead et al. (2010a,b) exploring the motivational aspects of diet.

Studies on physical activity suggest that Indigenous peoples are relatively active. Furthermore, the findings of two studies indicate that overweight and obese participants are also engaged in high levels of physical activity (Hopping et al., 2010a; Hopping et al., 2010b). These findings may, in part, be related to the use of self-report measures, as participants may have over-estimated their activity (Dyrstad, Hansen, Holme, & Anderssen, 2014) or perhaps BMI is not a good indicator of body composition in this population. Accordingly, Akande et al. (2015) suggest that the International Physical Activity Questionnaire (IPAQ) should be disregarded for the Inuit peoples. The weakness of questionnaire and physical activity diaries/logs is their need to be specific regarding the population and culture they examine (Strath et al., 2013). A more accurate measure of physical activity may be considered depending on feasibility/practicality, availability or resources, the administrations considerations and the desired outcomes (Strath et al., 2013). Additional studies are required to determine the actual practice of physical activity among Indigenous Canadians.

Cardiovascular health research among Canadian Indigenous women is now receiving more attention (Prince et al., 2018). As seen in this review, specific women's physical activity interventions are required but it is also very relevant to include a wider gender perspective. For example, it would be interesting to examine the disparities between men and women with respect to food choices. Also, as noted in this scoping review, very little research has focused on Métis health, which would be another relevant topic for future study (Kumar, Wesche, & McGuire, 2012).

Nursing implications

Nurses play an important role in cardiovascular health promotion and disease prevention (Canadian Council of Cardiovascular Nurses, 2015). Nurses working with the Indigenous population in the community must support initiatives that encompass the social determinants of health. Strategies related to improving diet and physical activity must address the economic and environmental, as well as cultural and historical barriers, such as re-emphasizing the value of traditional foods, and encouraging activity that is culturally relevant and feasible for indigenous peoples.

In order to provide optimal care to their Indigenous patients, cardiovascular nurses must develop and maintain cultural competency. Cultural training programs must be designed specifically for nurses, with integration of local knowledge because First Nations, Métis, and Inuit populations each have their own contexts and particularities.

Although the Canadian Nurses Association (2018) recently published an updated position statement on promoting cultural competence in nursing, and many nursing programs now include related topics in their curricula, it is also the individual nurse's responsibility to ensure cultural competence and safety in the care provided to Indigenous peoples. To this end, ongoing educational opportunities related to cultural competence must be promoted, as well as accessible to nurses in hospitals, communities, and educational instutions.

Conclusion

Cardiovascular disease occurrence is higher among Indigenous peoples than among non-Indigenous peoples, and this may be explained by differences in the social determinants of health, as well as individual risk factors for CVD. This scoping review presented a comprehensive analysis of the literature pertaining to dietary and physical activity behaviours among Indigenous peoples over the last ten years. The findings suggest that the rate of consumption of traditional foods varies widely among Canadian Indigenous communities. Globally, the food transition among Indigenous peoples is reflected by a decrease in the traditional diet, resulting in decreased nutritional quality. While it seems that many Indigenous peoples are engaged in regular physical activity, the methodology has been inconsistent. This review may, therefore, serve as a cornerstone for targeting issues in dietary and physical activity behaviours among Indigenous peoples in Canada. Finally, cardiovascular nurses have an important role to play in promoting cardiovascular health among Indigenous peoples. Knowledge of the social and cultural context of the determinants of health will facilitate the provision of culturally competent care and contribute to reducing cardiovascular health inequalities between Indigenous and non-Indigenous Canadians.

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REFERENCES

Akande, V. O., Hendriks, A. M., Ruiter, R. A., & Kremers, S. P. (2015). Determinants of dietary behavior and physical activity among Canadian Inuit: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity, 12*(84). doi:10.1186/s12966-015-0252-y

Alfred, T. (2015). Cultural strength: restoring the place of indigenous knowledge in practice and policy. *Australian Aboriginal Studies, 2015*(1), 3-11.

Anand, S. S., Yusuf, S., Jacobs, R., Davis, A. D., Yi, Q., Gerstein, H., . . . Lonn, E. (2001). Risk factors, atherosclerosis, and cardiovascular disease among Aboriginal people in Canada: The Study of Health Assessment and Risk Evaluation in Aboriginal Peoples (SHARE-AP). *The Lancet, 358*(9288), 1147-1153. doi:10.1016/S0140-6736(01)06255-9

Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology, 8*(1), 19-32. doi:10.1080/1364557032000119616

Batal, M., & Decelles, S. (2019). A scoping review of obesity among Indigenous peoples in Canada. *Journal of Obesity, 2019*. Article ID 9741090. doi:10.1155/2019/9741090

Batal, M., Johnson-Down, L., Moubarac, J.-C., Ing, A., Fediuk, K., Sadik, T., . . . Willows, N. (2017). Quantifying associations of the dietary share of ultra-processed foods with overall diet quality in First Nations peoples in the Canadian provinces of British Columbia, Alberta, Manitoba and Ontario. *Public Health Nutrition, 21*(1), 103-113. doi:10.1017/S1368980017001677

Bruner, B., & Chad, K. (2013a). Dietary practices and influences on diet intake among women in a Woodland Cree community. *Journal of Human Nutrition and Dietetics, 27*(s2), 220-229. doi:10.1111/jhn.12121

Bruner, B., & Chad, K. (2013b). Physical activity attitudes, beliefs, and practices among women in a Woodland Cree community. *Journal of physical activity and health, 10*(8), 1119-1127. doi:10.1123/jpah.10.8.1119

Canadian Council of Cardiovascular Nurses. (2015). *Standards for Cardiovascular Nursing*. Retrieved from http://www.cccn.ca/media.php?mid=1182

Canadian Society for Exercise Physiology. (2017). *Canadian 24-Hour movement guidelines : Glossary of terms*. Retrieved from http://www.csep.ca/fr/directives/glossaire-2017

Coble, J. D., Rhodes, R. E., & Higgins, J. W. (2009). Physical activity behaviors and motivations in an adult First Nation population: A pilot study. *Ethnicity & Disease, 19*(1), 42-48.

Colapinto, C. K., Graham, J., & St-Pierre, S. (2018). Trends and correlates of frequency of fruits and vegetable consumption, 2007 to 2014. *Health Reports, 29*(1), 9-14.

Crowshoe, L., Dannenbaum, D., Green, M., Henderson, R., Hayward, M. N., & Toth, E. (2018). Type 2 Diabetes and Indigenous Peoples. *Canadian Journal of Diabetes, 42*(sS), S296-S306. doi:10.1016/j.jcjd.2017.10.022

Dahlberg, E. E., Dahlberg, E. E., Hamilton, S. J., Hamid, F., & Thompson, S. C. (2018). Indigenous Australians perceptions' of physical activity: A qualitative systematic review. *International Journal of Environmental Research and Public Health, 15*(7). doi:10.3390/ijerph15071492

Dyrstad, M. S., Hansen, H. B., Holme, M. I., & Anderssen, A. S. (2014). Comparison of self-reported versus accelerometer-measured physical activity. *Medicine & Science in Sports & Exercise, 46*(1), 99-106. doi:http://dx.doi.org/10.1249/MSS.0b013e3182a0595f

Erber, E., Beck, L., Hopping, B. N., Sheehy, T., De Roose, E., & Sharma, S. (2010b). Food patterns and socioeconomic indicators of food consumption amongst Inuvialuit in the Canadian Arctic. *Journal of Human Nutrition and Dietetics, 23*(s1), 59-66. doi:10.1111/j.1365-277X.2010.01097.x

Erber, E., Hopping, B. N., Beck, L., Sheehy, T., De Roose, E., & Sharma, S. (2010a). Assessment of dietary adequacy in a remote Inuvialuit population. *Journal of Human Nutrition and Dietetics, 23*(s1), 35-42. doi:10.1111/j.1365-277X.2010.01098.x

Findlay, L. (2011). Physical activity among First Nations people off reserve, Métis and Inuit. *Health Reports, 22*(1), 47-54.

Foulds, H. J., Bredin, S. S., & Warburton, D. E. (2012). An evaluation of the physical activity and health status of British Columbian Aboriginal populations. *Applied Physiology, Nutrition, and Metabolism, 37*(1), 127-137. doi:10.1139/h11-138

Garriguet, D. (2008). Obesity and the eating habits of the Aboriginal population. *Health Reports, 19*(1), 1-17.

Gaudin, V. L., Receveur, O., Walz, L., Girard, F., & Potvin, L. (2014). A mixed methods inquiry into the determinants of traditional food consumption among three Cree communities of Eeyou Istchee from an ecological perspective. *International Journal of Circumpolar Health, 73*(1). doi:10.3402/ijch.v73.24918

Government of Canada. (1982). *Constitution Acts* Retrieved from https://laws-lois.justice.gc.ca/eng/Const/page-16.html

Government of Canada. (2010). *Eating well with Canada's food guide - First Nations, Inuit and Métis*. Retrieved from https://www.canada.ca/en/health-canada/services/food-nutrition/reports-publications/eating-well-canada-food-guide-first-nations-inuit-metis.html

Government of Canada. (2018). *Revision process for Canada's food guide*. Retrieved from https://www.canada.ca/en/health-canada/services/canada-food-guide/about/revision-process.html#a5.5

Government of Canada. (2019). *Food guide snapshot -Other languages*. Retrieved from https://www.canada.ca/en/health-canada/services/canada-food-guide/resources/snapshot/languages.html

Guh, D. P., Zhang, W., Bansback, N., Amarsi, Z., Birmingham, C. L., & Anis, A. H. (2009). The incidence of co-morbidities related to obesity and overweight: A systematic review and meta-analysis. *BMC Public Health, 9*(88). doi:10.1186/1471-2458-9-88

Gwynn, J., Sim, K., Searle, T., Senior, A., Lee, A., & Brimblecombe, J. (2019). Effect of nutrition interventions on diet-related and health outcomes of Aboriginal and Torres Strait Islander Australians: a systematic review. *BMJ open, 9*(4). doi:10.1136/bmjopen-2018-025291

Halseth, R. (2015). *The nutritional health of the First Nations and Métis of the Nortwest Territories: A review of current knowledge and gaps*. Prince George (BC): National collaborating centre for Aboriginal health.

Health Canada. (2019). *Canada's Dietary Guidelines for health professionals and policy makers*. Retrieved from https://food-guide.canada.ca/static/assets/pdf/CDG-EN-2018.pdf

Ho, L., Gittelsohn, J., Sharma, S., Cao, X., Treuth, M., Rimal, R., . . . Harris, S. (2008). Food-related behavior, physical activity, and dietary intake in First Nations–A population at high risk for diabetes. *Ethnicity & Health, 13*(4), 335-349. doi:10.1080/13557850701882936

Hopping, B., Erber, E., Beck, L., De Roose, E., & Sharma, S. (2010a). Inuvialuit adults in the Canadian Arctic have a high body mass index and self-reported physical activity. *Journal of Human Nutrition and Dietetics, 23*(s1), 115-119. doi:10.1111/j.1365-277X.2010.01103.x

Hopping, B., Erber, E., Mead, E., Roache, C., & Sharma, S. (2010b). High levels of physical activity and obesity co-exist amongst Inuit adults in Arctic Canada. *Journal of Human Nutrition and Dietetics, 23*(s1), 110-114. doi:10.1111/j.1365-277X.2010.01096.x

Hopping, B., Erber, E., Mead, E., Sheehy, T., Roache, C., & Sharma, S. (2010c). Socioeconomic indicators and frequency of traditional food, junk food, and fruit and vegetable consumption amongst Inuit adults in the Canadian Arctic. *Journal of Human Nutrition and Dietetics, 23*(s1), 51-58. doi:10.1111/j.1365-277X.2010.01100.x

Hopping, B., Mead, E., Erber, E., Sheehy, C., Roache, C., & Sharma, S. (2010d). Dietary adequacy of Inuit in the Canadian Arctic. *Journal of Human Nutrition and Dietetics, 23*(s1), 27-34. doi:10.1111/j.1365-277X.2010.01099.x

Hu, X. F., Singh, K., Kenny, T.-A., & Chan, H. M. (2019). Prevalence of heart attack and stroke and associated risk factors among Inuit in Canada: A comparison with the general Canadian population. *International Journal of Hygiene and Environmental Health, 222*(2), 319-326. doi:10.1016/j.ijheh.2018.12.003

Institut national de santé publique du Québec. (2015). *The Diet of Québec First Nations and Inuit peoples*. Québec (QC) : Gouvernement du Québec.

Joncas, J.-A., & Roy, B. (2015). Les grossesses chez les adolescentes autochtones au Canada [Teenage pregnancy in Aboriginal population]. *Recherches amérindiennes au Québec, 45*(1), 17-27. doi:https://doi.org/10.7202/1035161ar

Kolahdooz, F., Butler, L., Lupu, M., Sheehy, T., Corriveau, A., & Sharma, S. (2014a). Assessment of dietary intake among Inuvialuit in Arctic Canada using a locally developed quantitative food frequency questionnaire. *Journal of the American College of Nutrition, 33*(2), 147-154. doi:10.1080/07315724.2013.874890

Kolahdooz, F., Simeon, D., Ferguson, G., & Sharma, S. (2014b). Development of a quantitative Food Frequency Questionnaire for use among the Yup'ik People of Western Alaska. *PLoS ONE, 9*(6), 1-5. doi:10.1371/journal.pone.0100412

Kuhnlein, H. V., Receveur, O., Soueida, R., & Berti, P. R. (2007). Unique patterns of dietary adequacy in three cultures of Canadian Arctic indigenous peoples. *Public Health Nutrition, 11*(4), 349-360. doi:10.1017/S1368980007000353

Kumar, M., Wesche, S., & McGuire, C. (2012). Trends in Métis-related health research (1980–2009): Identification of research gaps. *Canadian Journal of Public Health, 103*(1), 23-28. doi:10.1007/BF03404064

Lanuza, D. M., Davidson, P. M., Dunbar, S. B., Hughes, S., & De Geest, S. (2011). Preparing nurses for leadership roles in cardiovascular disease prevention. *European Journal of Cardiovascular Nursing, 10* (s2), S51-S57. doi:10.1016/S1474-5151(11)00116-2

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: Advancing the methodology. *Implementation Science, 5*(69). doi:10.1186/1748-5908-5-69

Mead, E., Gittelsohn, J., Kratzmann, M., Roache, C., & Sharma, S. (2010a). Impact of the changing food environment on dietary practices of an Inuit population in Arctic Canada. *Journal of Human Nutrition and Dietetics, 23*(s1), 18-26. doi:10.1111/j.1365-277X.2010.01102.x

Mead, E., Gittelsohn, J., Roache, C., & Sharma, S. (2010b). Healthy food intentions and higher socioeconomic status are associated with healthier food choices in an Inuit population. *Journal of Human Nutrition and Dietetics, 23*(s1), 83-91. doi:10.1111/j.1365-277X.2010.01094.x

O'Brien, K. K., Colquhoun, H., Levac, D., Baxter, L., Tricco, A. C., Straus, S., . . . O'Malley, L. (2016). Advancing scoping study methodology: a web-based survey and consultation of perceptions on terminology, definition and methodological steps. *BMC Health Services Research, 16*(305). doi:10.1186/s12913-016-1579-z

Pakseresht, M., & Sharma, S. (2010). Validation of a quantitative food frequency questionnaire for Inuit population in Nunavut, Canada. *Journal of Human Nutrition and Dietetics, 23*(S1), 67-74. doi:10.1111/j.1365-277X.2010.01104.x

Paquet, N. (2016). La résurgence autochtone, un passage nécessaire vers une réconciliation : l'exemple de l'alimentation traditionnelle [The Indigenous resurgence, a necessary step to a reconciliation : the example of traditional food]. *Cahiers du CIÉRA, 13*, 79-99.

Plano Clark, V., & Ivankova, N. (2016). *Mixed methods research: A guide to the field*. Thousand Oaks (CA): SAGE.

Prince, S. A., Adamo, K., Hamel, M. E., Hardt, J., Gorber, S. C., & Tremblay, M. (2008). A comparison of direct versus self-report measures for assessing physical activity in adults: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity, 5*(56). doi:10.1186/1479-5868-5-56

Prince, S. A., McDonnell, L. A., Turek, M. A., Visintini, S., Nahwegahbow, A., Kandasamy, S., . . . Coutinho, T. (2018). The state of affairs for cardiovascular health research in Indigenous women in Canada: A scoping review. *Canadian Journal of Cardiology, 34*(4), e2-e2. doi:10.1016/j.cjca.2017.11.019

Public Health Agency of Canada. (2016). *Health status of Canadians 2016: A report of the chief public health officer*. Ottawa (ON): Minister of Health.

Public Health Agency of Canada. (2018). *Key health inequalities in Canada: A national portrait*. Ottawa (ON): Author.

Quadir, T., & Akhtar-Danesh, N. (2010). Fruit and vegetable intake in Canadian ethnic populations. *Canadian Journal of Dietetic Practice and Research, 71*(1), 11-16. doi:10.3148/71.1.2010.11

Ryan, C. J., Cooke, M., Kirkpatrick, S. I., Leatherdale, S. T., & Wilk, P. (2017). The correlates of physical activity among adult Métis. *Ethnicity & Health, 23*(6), 1-20. doi:10.1080/13557858.2017.1294655

Sharma, S., Cao, X., Gittelsohn, J., Ho, L. S., Ford, E., Rosecrans, A., . . . Zinman, B. (2007). Dietary intake and development of a quantitative food-frequency questionnaire for a lifestyle intervention to reduce the risk of chronic diseases in Canadian First Nations in north-western Ontario. *Public Health Nutrition, 11*(8), 831-840. doi:10.1017/S1368980007001218

Sharma, S., Cao, X., Roache, C., Buchan, A., Reid, R., & Gittelsohn, J. (2010). Assessing dietary intake in a population undergoing a rapid transition in diet and lifestyle: The Arctic Inuit in Nunavut, Canada. *British Journal of Nutrition, 103*(5), 749-759. doi:10.1017/S0007114509992224

Sharma, S., De Roose, E., Cao, X., Pokiak, A., Gittelsohn, J., & Corriveau, A. (2009). Dietary intake in a population undergoing a rapid transition in diet and lifestyle: The Inuvialuit in the Northwest Territories of Arctic Canada. *Canadian Journal of Public Health, 100*(6), 442-448.

Sharma, S., Gittelsohn, J., Rosol, R., & Beck, L. (2010). Addressing the public health burden caused by the nutrition transition through the Healthy Foods North nutrition and lifestyle intervention programme. *Journal of Human Nutrition and Dietetics, 23*(s1), 120-127. doi:10.1111/j.1365-277X.2010.01107.x

Sharma, S., Hopping, B., Roache, C., & Sheehy, T. (2013). Nutrient intakes, major food sources and dietary inadequacies of Inuit adults living in three remote communities in Nunavut, Canada. *Journal of Human Nutrition and Dietetics, 26*(6), 578-586. doi:10.1111/jhn.12091

Sheehy, T., Kolahdooz, F., Roache, C., & Sharma, S. (2014). Changing dietary patterns in the Canadian Arctic: Frequency of consumption of foods and beverages by Inuit in three Nunavut communities. *Food and Nutrition Bulletin, 35*(2), 244-252. doi:10.1177/156482651403500211

Sheehy, T., Kolahdooz, F., Roache, C., & Sharma, S. (2015). Traditional food consumption is associated with better diet quality and adequacy among Inuit adults in Nunavut, Canada. *International Journal of Food Sciences and Nutrition, 66*(4), 445-451. doi:10.3109/09637486.2015.1035232

Sheehy, T., Roache, C., & Sharma, S. (2013). Eating habits of a population undergoing a rapid dietary transition: Portion sizes of traditional and non-traditional foods and beverages consumed by Inuit adults in Nunavut, Canada. *Nutrition Journal, 12*(70). doi: 10.1186/1475-2891-12-70

Sheikh, N., Egeland, G. M., Johnson-Down, L., & Kuhnlein, H. V. (2011). Changing dietary patterns and body mass index over time in Canadian Inuit communities. *International Journal of Circumpolar Health, 70*(5), 511-519. doi:10.3402/ijch.v70i5.17863

Smylie, J., & Firestone, M. (2016). The health of Indigenous peoples. In: Dennis Raphael (Ed.), *Social determinants of health : Canadian perspectives* (3th ed., pp. 434-466). Toronto (ON): Canadian Scholars.

Sport for Life Society. (2019). *Indigenous Long-Term Participant Development Pathway 1.2 Resource*. Retrieved from https://sportforlife.ca/wp-content/uploads/2019/09/ILTPD_Sept2019_EN_web.pdf

Statistics Canada. (2018). *First Nations peoples, Métis and Inuit in Canada : Diverse and growing populations.* Retrieved from http://www.statcan.gc.ca/pub/89-659-x/89-659-x2018001-eng.pdf

Strath, J. S., Kaminsky, A. L., Ainsworth, E. B., Ekelund, S. U., Freedson, A. P., Gary, R. R., . . . Swartz, M. A. (2013). Guide to the assessment of physical activity: Clinical and research applications. *Circulation, 128*(20), 2259-2279. doi:10.1161/01.cir.0000435708.67487.da

Tjepkema, M., Wilkins, R., Goedhuis, N., & Pennock, J. (2012). Cardiovascular disease mortality among First Nations people in Canada, 1991-2001. *Chronic Diseases and Injuries in Canada, 32*(4), 200-207. doi:10.1017/S1431927612012615

Tobe, S. W., Maar, M., Roy, M. A., & Warburton, D. E. R. (2015). Preventing cardiovascular and renal disease in Canada's aboriginal populations. *Canadian Journal of Cardiology, 31*(9), 1124-1129. doi:10.1016/j.cjca.2015.05.024

Turin, T. C., Saad, N., Jun, M., Tonelli, M., Ma, Z., Barnabe, C. C. M., . . . Hemmelgarn, B. (2016). Lifetime risk of diabetes among First Nations and non–First Nations people. *Canadian Medical Association Journal, 188*(16), 1147-1153. doi:10.1503/cmaj.150787

Willows, N. D. (2005). Determinants of healthy eating in Aboriginal peoples in Canada: The current state of knowledge and research gaps. *Canadian Journal of Public Health, 96*(S3), S32-S36.

World Health Organization. (2004). *Obesity : preventing and managing the global epidemic : report of a WHO consultation.* Retrieved from https://www.who.int/nutrition/publications/obesity/WHO_TRS_894/en/

Young, T. K., & Katzmarzyk, P. T. (2007). Physical activity of Aboriginal people in Canada. *Applied Physiology, Nutrition, and Metabolism, 32*(S2F), S165-S178. doi:10.1139/H07-164

Zotor, F., Sheehy, T., Lupu, M., Kolahdooz, F., Corriveau, A., & Sharma, S. (2012). Frequency of consumption of foods and beverages by Inuvialuit adults in Northwest Territories, Arctic Canada. *International Journal of Food Sciences and Nutrition, 63*(7), 782-789.

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