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Editorial

For every dark night there is a brighter day!
—Tupac Shakur

Although some have said that there are still more dark days (and nights) ahead, we know that brighter days are on the horizon! Cardiovascular nurses continue to be committed to making a difference in patients' lives. We saw evidence of this at the recent annual conference of the Canadian Council of Cardiovascular Nurses (CCCN). The response to this first ever virtual format of the conference—in the middle of a pandemic—was beyond all expectations! Clearly, nurses are still eager to learn! If you are not already a member of the CCCN, I encourage you to join now; become part of a national network of cardiovascular nurses and access ongoing learning opportunities in the area of cardiovascular nursing.

In the current issue of the CJCN, Dr. Lusine Abrahamyan and associates share their concerning findings of a recent narrative review on access and referral to heart failure clinics in Canada. Dr. Karen Harkness and colleagues present the findings of a quality improvement initiative in which an existing USA-developed, patient decision aid for a destination therapy ventricular assist device (VAD) was adapted for use in Ontario, Canada. Lastly, Dr. Sabrina Wong and co-authors report on the interesting findings of their retrospective study of a nurse-led, transitional care, home visiting program for heart failure patients.

Happy reading!
Jo-Ann V. Sawatzky, RN, PhD
Editor, CJCN

Message from the CCCN President

As we approach the end of a challenging year in healthcare, I wanted to reach out to our cardiovascular nursing community to thank you for all that you are doing to keep patients, families and your own extended family members well during these unprecedented times. In times like this, it is helpful to keep connected and CCCN is committed to help you meet information needs and networking opportunities across the country. Please consider joining our renewing CCCN to stay connected. Benefits of being a CCCN member are included below.

Thanks to each of you who continue to make the difference in cardiovascular care in Canada.

CCCN President
Brenda Ridley

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Access and Referral to Heart Failure Clinics in Canada: A Narrative Review

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Abstract

Background: *Heart failure (HF) clinics are recommended for "high-risk" patients.*

Purpose: *To narratively review: (1) what is known about the availability of HF clinics in Canada, (2) which patients access them in relation to guideline recommendations, and (3) multi-level factors affecting access.*

Methods: *Search of Medline, and grey literature.*

Results: *Most clinics exist in Quebec, Ontario, and British Colombia, but there are not enough. While little evidence exists (only two studies; one in Canada), few patients access these clinics (~10-20%), and there is access inequity. Referral criteria across guidelines are inconsistent, with variably-defined recommendations that "high-risk" patients be referred. Multi-factorial issues are at play, including referring hospital characteristics, type of treating healthcare professional, clinic-level factors, and patient-level factors, such as socioeconomic status.*

Conclusions: *Heart failure clinic availability in Canada is insufficient, and access is inequitable.*

Implications: *Cardiovascular nurses can help to promote and provide more optimal HF clinic access in Canada, to improve patient outcomes.*

Key words: heart failure, referral and consultation, review, access, health services research

Abrahamyan, L., Ross, H., Gianetti, N., Rac, V., Virani, S., Wijeysundera, H., Zieroth, S., Howlett, J., Krahn, M., Soerensen, I., & Grace, S. L. (2020). Access and Referral to Heart Failure Clinics in Canada: A Narrative Review. *Canadian Journal of Cardiovascular Nursing*, *30*(3), 4–11.

Key Highlights

- Only a fraction of heart failure (HF) patients access HF clinics, despite guideline recommendations.
- There are few HF clinics in Canada, with substantial variations in clinic structure.
- Multi-level factors, including hospital characteristics, type of treating provider, inconsistent referral criteria, and patient sex/gender are related to low and inequitable use of clinics; cardiovascular nurses can play a key role in addressing these issues to ensure optimal patient outcomes.

Introduction

Heart failure (HF) is a chronic, progressive and incurable condition, punctuated by acute exacerbations. Due to exercise intolerance, shortness of breath, and fatigue, among other symptoms, patients with HF often have impaired quality of life (Dai et al., 2012). About 90,000 Canadians over the age of 40 are diagnosed with HF each year; in 2012, 669,600 people in Canada were living with HF (Blais et al., 2014; Public Health Agency of Canada, 2018).

Canadian HF patients are frequently hospitalized, such that HF patients comprise 2.3% of all hospitalizations (Canadian Institute for Health Information, 2020; Dai et al., 2012). HF has the second highest readmission rate of all conditions, reaching 18% within 30 days of the index admission (Samsky et al., 2019). Accordingly, HF management cost overall is estimated at 2% of total health expenditures (Cook et al., 2014), and hospitalization alone, in Canada, will cost $2.8 billion per year by 2030 (Tran et al., 2016).

Despite significant technological advancements in care (Yeung et al., 2012), and improved outcomes in other cardiovascular diseases in the Western world (Tu et al., 2009), HF prognosis remains poor. Based on available Canadian data, the risk-adjusted mortality after HF diagnosis is 10% at 30 days and 25% at one year in Canada (Yeung et al., 2012). For patients hospitalized with HF, the reported 10-year overall mortality is 99% with a median survival of 1.75 years (Chun et al., 2012). The five-year age- and sex-adjusted relative survival for HF (62%) is similar to that for cancers (50-57%; Askoxylakis et al., 2010; Stewart et al., 2001).

The goals of HF treatment include avoiding acute decompensation and need for hospitalization, as well as optimizing quantity and quality of life. This is achieved though evidence-based pharmacological and device-based care, and disease management. Current HF guidelines recommend lifestyle modifications (e.g., salt restriction, physical exercise), medications (e.g., renin-angiotensin-aldosterone system inhibition, beta-blockers, mineralocorticoid receptor antagonist therapy, & diuretics), requiring careful titration, and consideration of device therapies (Ezekowitz et al., 2017; Ponikowski et al., 2016; Yancy et al., 2018). Some patients may be eligible for mechanical circulatory support and/or heart transplant. For these patients, ongoing specialty care is also key. For optimal care, these complex patients require specialized, continuous, and coordinated care involving multiple healthcare providers and disciplines (Ezekowitz et al., 2017; Health Quality Ontario and Ministry of Health and Long Term Care, 2015).

The first specialized disease management programs or clinics began proliferating in the 1990s (Jaarsma & Strömberg, 2014), with Canadian guidelines first recommending these clinics in 2006 (Arnold et al., 2006). Indeed, provision of care for individuals with HF through these clinics is recommended in HF practice guidelines in Canada (Howlett et al., 2010), the United States (Yancy et al., 2018), and Europe (Ponikowski et al., 2016). Typically, these are outpatient, interprofessionally-delivered clinics, offering optimization of therapies, patient self-management education, ongoing surveillance, and management of clinical deterioration. Heart failure clinics are offered in a variety of settings, such as acute care hospitals, stand-alone clinics in the community, and primary care, and may offer services in the home, which may include remote monitoring with newer technologies (Health Quality Ontario, 2018; Jaarsma et al., 2006; Takeda et al., 2019). However, there appears to be little guidance on standards or core services. The most specific guidance appears in the HF Society of America consensus statement of 2008, which is dated (Hauptman et al., 2008), and the recent HF standards from Health Quality Ontario (Health Quality Ontario, 2018), which define: "specialized multidisciplinary care," but not HF clinics per se (p. 31). The latter definition was nevertheless adopted for the purposes of this review.

Compelling evidence from more than 60 randomized trials, and 15 meta-analyses report reductions in all-cause mortality by 15-20%, HF-related hospitalizations by 30-56%, and all-cause readmissions by 15-25% with HF clinic access compared to usual care (Clark & Thompson, 2012; Savard et al., 2011). The most recent meta-analysis reported 42% reductions in the composite outcomes of HF hospitalization and all-cause mortality (Gandhi et al., 2017). Effect sizes of such magnitude are not common across many disease conditions, and translate into many life years saved. Impact appears to be greater with greater intensity of visits and follow-up (Gandhi et al., 2017; Wijeysundera et al., 2013). There is also evidence to support cost-effectiveness of these clinics in Canada (Wijeysundera et al., 2013) and elsewhere (Pulignano et al., 2010; Van Spall et al., 2017).

However, the population impact of HF clinics has been limited because so few receive this care. For example, only one in 10 HF patients are seen in HF clinics in Ontario, with no jurisdiction serving more than 18% of patients (Wijeysundera et al., 2013). The reasons why are largely unknown. Moreover, there is lack of clarity on who should receive care in HF clinics, and discrepancies or biases in terms of which patients gain access (Abrahamyan et al., 2018; Gravely et al., 2012; Howlett, 2014). Therefore, the purpose of this narrative review was to summarize what is known about: (1) the availability and nature of HF clinics in Canada, (2) how many and which patients are being referred to/access them, and (2b) how this corresponds with guideline recommendations and policies in Canada and elsewhere, as well as (3) multi-level (e.g., system/organizational, provider, clinic, patient) factors affecting who is accessing them, and (4) implications. This was achieved through a review of Medline (see online Appendix at https://sgrace.info.yorku.ca/publications/ for search strategy from inception through April 2, 2019 created by an information specialist; Grace, 2020), as well as a grey literature search (including guideline repositories), and consultation with HF experts from across the country.

Availability and Nature of HF Clinics in Canada

Available sources revealed there are 34 HF clinics in Ontario (Wijeysundera et al., 2012), 47 in Quebec (Society of Quebec Cardiologists, 2020), 22 clinics in British Columbia (Provincial Health Services Authority, 2010), 11 in Alberta, three in Saskatchewan, one in Manitoba (which is also serving Northern Ontario and part of Nunavut), four in each of New Brunswick and Nova Scotia, and none in Prince Edward Island (the latter are all based on personal communication from co-authors, June 2019). It is important to note that these are "self-identified" clinics, which may not offer all components or elements recommended by the HF Society of America (Hauptman et al., 2008), or Health Quality Ontario (Health Quality Ontario, 2018). A 2012 study reported that the Ontario clinics are located in 12 out of 14 administrative health regions, with substantial variation in the population density they serve, ranging from 1:179,200 to 1:761,400 persons (Wijeysundera et al., 2012). It is not well-known how many clinics exist in other provinces and territories (Virani et al., 2020). Evidence suggests these clinics are primarily situated in larger-volume hospitals, whereas in the United States they are also found in smaller-volume institutions (McAlister et al., 2018). The appropriate number of HF clinics per capita/HF patient has not not been established. However, given the burden of HF as outlined above, there is likely still insufficient capacity in Canada, as has been observed in other countries (Driscoll et al., 2006; Jaarsma et al., 2006).

Nature/Structure

Regarding personnel, the 2010 Canadian Cardiovascular Society (CCS) HF guidelines recommended that HF clinics be staffed by "physicians, nurses, pharmacists, dietitians or other healthcare professionals with expertise in HF (Class I, Level A recommendation)" (Howlett et al., 2010, p.192). The most recent, 2017 updated guideline also recommended an 'interprofessional team' including, ideally, a physician, nurse, and pharmacist (Strong recommendation, High-quality evidence; Ezekowitz et al., 2017). A recent survey of Canadian clinics, with responding programs primarily in advanced care centres, revealed programs are almost all staffed by cardiologists, followed most often by a complement of nurses (i.e., an average of 2.31 Registered Nurse full-time equivalents [FTEs], and/or 1.67 Registered Practical Nurse FTEs, and/or 2.83 Advanced Practice Nurse FTEs, and/or 1.25 Nurse Practitioner FTEs), then administrative staff (1.6 FTEs) and allied health (0.7 FTEs; Virani et al., 2020). This demonstrates the key role that nurses play in these clinics. Although dated, the only provincial-level data come from Ontario and Alberta. In the former, HF clinics varied substantially in terms of number and type of personnel (Wijeysundera et al., 2012); the 34 clinics had a range from one to eight physicians, one to six nurses, and less than half of the clinics employed a dietitian or pharmacist. In Alberta, all of the 11 clinics had clerical assistance, nurses/nurse-practitioners and a cardiologist, as well as access to physiotherapy, occupational therapy, social work, and dietitians; four of the programs also had dedicated pharmacists (J. Howlett, personal communication, June 3, 2019).

While not shown by province, the recent Canadian survey of HF clinics suggested average annual volumes of 2496 visits per clinic per year, with expected variation by clinic size (Virani et al., 2020). The Ontario review also revealed major variation in annual volume (i.e., 200-1,749 visits; Wijeysundera et al., 2012). Based on available Canadian data, the average number of HF clinic visits per patient varied from three to eight within the first year of HF clinic enrollment (Abrahamyan et al., 2013). This is despite a recent meta-analysis suggesting benefits accrue with longer follow-up and more frequent visits (Gandhi et al., 2017). At Alberta's HF clinics, a median of 300 patients/year are served (J. Howlett, personal communication, June 3, 2019).

Existing evidence suggests that HF clinics are also heterogeneous in program structure (Riegel et al., 2010), and patterns of care (Abrahamyan et al., 2013; Clark & Thompson, 2012; Wijeysundera et al., 2013). The recent Canadian survey revealed 98% of responding clinics offer optimization of medical therapies, 78% offer advance care planning, 73% self-management support services, and 68% offer exercise training/access to cardiac rehabilitation (Virani et al., 2020). Almost all programs (98%) offered nursing support by telephone, and half (51%) offered remote monitoring of patients. The Ontario review revealed major variation in provided services (e.g., in-clinic dietary counselling, medication review; Wijeysundera et al., 2012). No other data on structure/patterns of care in Canada were identified through the literature review.

Finally, regarding wait times, the CCS HF guideline recommends that patients with recurrent hospitalizations be seen in a HF clinic within four weeks of discharge (Howlett et al., 2010), and the new Health Quality Ontario standards recommend HF clinic wait time as a quality indicator (Health Quality Ontario, 2018). Two-thirds of clinics responding to the recent national survey reported they were meeting this four-week benchmark (Virani et al., 2020). The only provincial-level data available show that wait times exceed recommendations in Quebec (Ducharme, 2017). Data from that province also show that patients accessing clinics have had their HF diagnosis for a median of 1.3 years before receiving care (Feldman et al., 2009). Those accessing the clinic with shorter disease duration were referred by a specialist, had higher income, and had been to the emergency department.

Referral and Access to Specialized Multidisciplinary Care: Rates

While Canadian patients are generally referred to HF clinics from acute care and also primary care, referral and subsequent use of HF clinics is low. There are few peer-reviewed studies on HF clinic usage rates at a population-level in any jurisdiction (Feldman, Huynh, Des Lauriers, et al., 2013; Gharacholou et al., 2011; Gravely et al., 2012; see online Table 1 https://sgrace.info.yorku.ca/publications/; Grace 2020). Based on Ontario administrative database analysis, 10.5% of HF patients were seen in HF clinics within a year from hospitalization (Wijeysundera et al., 2013). Based on a secondary analysis of another Ontario-based study, only 15% of hospitalized HF patients self-reported referral to HF clinics, and of those, 85% reported accessing the clinics (Gravely et al., 2012). A study in Quebec reported that after an emergency department visit, 29% of patients self-reported a referral to HF clinics at six weeks and 38% at six months (Feldman, Huynh, Lauriers, et al., 2013). In Alberta, an estimated 15% of patients access HF clinics. While appropriateness cannot be ascertained from these data, and guideline recommendations vary on who should be referred (see below), these are highly variable rates, indicating practice variations between provinces, as are observed elsewhere (Emdin et al., 2017).

HF Clinic Referral and Access: Guideline Recommendations and Policies

How does this conform with International and Canadian guidelines and policies regarding who should be referred to/access HF clinics? Current clinical practice guidelines are consistent in recommending referral to clinics for optimal HF management, but provide inconsistent patient eligibility criteria for referral (see online Table 2; https://sgrace.info.yorku.ca/publications/; Grace 2020). Previous versions of the guidelines shown, namely the 2013 American (Yancy et al., 2013) and 2010 Canadian guidelines (Howlett et al., 2010), recommend using multidisciplinary HF programs for patients at "high risk" of hospitalization (defined in different ways), while the 2016 European guideline (Ponikowski et al., 2016) recommends access for all HF patients regardless of acuity. A subsequent 2014 CCS survey of HF experts in Canada identified 12 criteria to define a 'high-risk' HF patient (e.g., non-adherence, recent HF hospitalization, new-onset HF; Howlett et al., 2016). This is consistent with a recent meta-analysis demonstrating greater benefit in 'high-risk' patients (Gandhi et al., 2017).

Canadian Policies

A rapid review by Health Quality Ontario (2015) found no studies that established the optimal patient referral criteria for HF clinics. The subsequent HF "quality-based procedures" (QBP) set/bundle, however, provided a list of referral criteria including 'high-risk' HF (not defined), recurrent hospitalizations, concomitant ischemia, and multi-morbidity (Health Quality Ontario and Ministry of Health and Long Term Care, 2015). This lack of clarity and specificity can lead to practice variation, which may negatively impact the outcomes of many HF patients.

Healthcare policies can also either support or impede utilization of HF clinics. Nationally, in 2016, the Heart and Stroke Foundation of Canada called upon governments and healthcare providers to "support integrated systems of care" for HF and "improve, expand and coordinate services across the continuum of care from prevention to diagnosis, treatment, management, end-of-life planning and palliative care" (Heart and Stroke Foundation, 2016, p. 12). Some provincial-level policies regarding HF clinics also exist. Alberta Health Services, for example, took a system-wide approach to enhance access by establishing a HF Network in 2008 (McAlister et al., 2013). Through this Alberta Cardiac Access initiative, several approaches to augment access to HF clinics were implemented, including training preceptorships, expansion of capacity in existing HF clinics, and establishment of five new clinics in under-serviced regions. The initiative resulted in lower 30-day mortality and readmission rates (adjusted odds ratio=0.83) when compared to regions without HF clinics. Similarly, British Columbia developed a Provincial HF Strategy in 2010 (Provincial Health Services Authority, 2010), which highlighted gaps in access to HF services and invested to create new HF clinics to achieve consistency in HF care across providers, jurisdictions, and geographies.

In Ontario, referral to a HF clinic became a recommended practice under Health Quality Ontario's HF QBP for post-acute episode of care in 2015 (Health Quality Ontario and Ministry of Health and Long-Term Care, 2015). The Ontario Cardiac Care Network's (now CorHealth) 2014 and 2017 HF strategies proposed to implement 'hub-and-spoke' models for integrated HF care, assigning a more defined role to HF clinics (i.e., 'primary hub for intermediate-complexity patients'; CorHealth Ontario, 2018); one of the proposed standards for the strategy included applying 'standardized referral criteria' to HF clinics. In 2018, CorHealth released an update recommending a regional 'spoke-hub-node' model of HF care. It delineates that 'spokes' are for low-risk and complexity patients, 'hubs' are for complex care in the community, such as an HF clinic (although HF clinics are not explicitly mentioned in the report, and tertiary 'nodes' or advanced cardiac hospitals are for high-risk patients (CorHealth Ontario, 2018). In 2018, Health Quality Ontario released quality standards for HF care in the community, which included referral to HF clinics (Health Quality Ontario, 2018). CorHealth subsequently released a roadmap for integrated HF care, where the above policies were implemented at several sites, with lessons learned forwarded for broader implementation (CorHealth Ontario, 2019).

As evidenced by this summary of available data on the availability and structure of HF clinics, as well as policies across provinces, clearly there is a lack of standardization across Canada with regard to where HF clinics fit in the health system, what they are comprised of and who should access them. This lack of standardization has signficant implications for future planning of the needed number, structure, and locations of HF clinics in Canada.

Factors Affecting Referral and Access to HF Clinics

Reasons why only a small fraction of patients are referred to, or access HF clinics despite these recommendations are not well-elucidated (Feldman, Huynh, Des Lauriers, et al., 2013; Gharacholou et al., 2011). Online Table 1 summarizes the only studies examining factors affecting HF clinic access in Canada, and elsewhere (https://sgrace.info.yorku.ca/publications/; Grace 2020). Given the substantial potential benefits of care in this highly fatal disease, investigating this access gap represents a real opportunity for improvement in care and outcomes. Lack of coordinated systems of HF care and clinics to which patients can be referred are major health system issues (Virani et al., 2017). Referral to a healthcare service is dependent upon a provider's action, while accessing care after referral is dependent upon a patient's behaviour. Thus, multi-level factors (e.g., health system, provider, clinic, patient) and mechanisms, individually and in combination, can affect referral and access (Feldman, Huynh, Lauriers, et al., 2013), and these are reviewed in turn below.

System/Organizational-level factors

A few studies have examined health system factors affecting HF clinic use. Having an outpatient HF clinic at the discharge hospital site and referral to other disease management programs (Gravely et al., 2012), as well as hospital type (e.g., academic) and larger size (Gharacholou et al., 2011) were shown to positively influence HF clinic utilization. Geographic location is another important factor. However, the establishment of clinics is rarely based on spatial analysis of disease prevalence, resources, and disparities in access (Wijeysundera et al., 2012).

Referring provider-level factors

Literature on provider-level factors influencing referral to HF clinics is lacking. However, some insights may be gleaned from reviews of physician factors affecting referral to cardiac rehabilitation programs (Ghisi et al., 2013). For example, we do not know if HF clinic referral decisions are influenced by existing referral policies or processes, funding mechanisms or financial arrangements (e.g., types of providers funded and how, billing), skepticism regarding the effectiveness of the clinics, or awareness of program availability, and acceptance criteria. It also may not be clear to physicians who should be making referrals: emergency room physicians, attendings, specialists, or primary care providers. A study in Quebec showed most patients (62%) were referred by a cardiologist or internist, but a substantial proportion were also referred by other specialists (24%) and general practitioners (14%; Feldman et al., 2009). As with cardiac rehabilitation, guidelines should be explicit, so patients are not missed.

HF clinic-level factors

Clinic-level factors such as capacity, human resources, location, integration with other disease management programs and the other services in the continuum of HF care (e.g., primary and specialist care), the relationship between delivering and referring providers, and clinic-specific referral criteria can also influence referral and access. Since there are no standardized referral criteria, HF clinics typically set their own (Virani et al., 2020), leading to variation. Moreover, HF clinics may have different criteria for newly-admitted and ongoing patients (Howlett et al., 2016).

Finally, integrated funding models for HF can also influence clinic referral criteria and processes through their effect on the continuum of care (Ministry of Health and Long-Term Care, 2018). Funding and human resources as raised above go hand-in-hand; there is an abundance of evidence supporting the optimization of care with advanced practice nurses, at less cost (Norful et al., 2018), thus enabling greater capacity.

Patient-level factors

Reflecting on variation in referral practices, clinics enrol dissimilar patient groups (e.g., range of average age: 54–75 years, and NYHA class IV: 2.3 to 21.4% of HF clinic population; Abrahamyan et al., 2013). As shown in Online Table 1 (https://sgrace.info.yorku.ca/publications/; Grace, 2020), there have only been three published studies on patient factors related to HF clinic use, and they do not point to consistency in terms of acuity being the basis for access; the patients that need them most are not accessing clinics. First, in a Quebec study, the patient-level predictors of referral within six months of discharge included male sex, younger age, and having systolic dysfunction (Feldman, Huynh, Des Lauriers, et al., 2013). This could suggest inequities, particularly based on gender. Second, an Ontario study reported that the patient-level predictors of access to HF clinics within one year of discharge included higher education, lower perceived stress, and lower functional status; age and sex were not significant predictors in this study (Gravely et al., 2012). Finally, in a US-based study, predictors included race/ethnicity, and several comorbidities (e.g., atrial fibrillation, depression, diabetes; Gharacholou et al., 2011). Differences between the patient-level predictors highlight, yet again, that the utilization of HF clinics is highly variable and context-dependent (Gravely et al., 2012). Patient-level barriers to access to HF clinics, and reasons for non-attendance despite referral, have also been scantly investigated (Crowder, 2006).

Discussion

Overall, it can be concluded that most HF patients do not access specialty clinics. The existing clinics vary significantly with regard to setting, structure, referral criteria, among many other parameters. Most of what we know stems from Ontario and Quebec only, with some information from the western-most provinces. How can we achieve the standardized Canadian indicators of quality HF care (Heckman et al., 2016) with such a fragmented and non-standardized system? While there are some congruent recommendations in Canada, we do not have consensus on how to even define a HF clinic, nor do we have means to measure HF care quality at a national level (Heckman et al., 2016).

Importantly as well, we do not know why in Canada only a small fraction of potentially-eligible HF patients receive care in HF clinics. While clearly capacity issues play a major role (particularly in the North and Manitoba), as does lack of direct government funding in most jurisdictions, is it also because they are not referred due to existing policies, and/or providers' beliefs / preferences? Is it the patient's preference not to be referred in some cases (i.e., provider raises and patient declines)? Are they referred, but face geographical, financial, or other individual or system-level barriers to access? Or are they not accepted for care because of clinic provider decisions? These are significant knowledge gaps that need to be addressed.

Moreover, perhaps a Canadian consensus process, in which cardiovascular nurses could play a central role, could be undertaken to delineate what evidence-based recommendations can be made on who would be best served in HF clinics. Then we could go about identifying the number of patients meeting the standardized criteria in Canadian provinces/regions, thus ensuring clinics have capacity and patients have access to high-quality, standardized HF clinics. There is also a need for research to establish which types of patients should be referred to the various levels of HF care. An outpatient HF registry could capture care receipt.

This review is limited in its narrative design; without a systematic literature review, it is possible some information on HF clinic referral and access may have been missed. Moreover, there was no primary data collection from HF clinics. However, an environmental scan and expert opinions were used to describe HF clinic availability in many provinces / territories where publications were not available.

In conclusion, HF clinics serve as centres to deal with complex cases in the community, where the latest guideline recommendations for care can be implemented. There is under-use, significant variation in access, inconsistent referral criteria, and lack of standardization in HF clinic models (including setting) in Canada. Cardiovascular nurses should play a key role in a multi-disciplinary team approach in this area, to support in particular development and implementation of national policies to ensure equitable, appropriate, and timely access to specialty HF care in communities across Canada.

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Adaptation of a Patient Decision Aid for a Ventricular Assist Device for Destination Therapy in Ontario, Canada

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Abstract

Background: *Patients considering a ventricular assist device for destination therapy (DT-VAD) face a complex decision. Patient decision aids (PDAs) facilitate informed, shared decision-making.*

Purpose: *The primary purpose of our quality improvement (QI) initiative was to produce a revised/adapted version of a USA-developed DT-VAD-PDA for use in Ontario, Canada.*

Methods: *Using mixed methods, we interviewed patients with DT-VADs, caregivers, and healthcare providers (HCPs; N = 18). Participants also completed an acceptability questionnaire on the USA-DT-VAD-PDA.*

Results: *Participants (N = 3 patients; 2 caregivers; 13 HCPs) indicated that the USA-DT-VAD-PDA included critically important information for patients and caregivers, and was a valuable patient teaching tool for HCPs. The interviews also elicited insightful recommendations for content adaptions and implementation strategies.*

Conclusions: *The outcome of this QI project was an evidence-informed DT-VAD-PDA that has the potential for HCPs to leverage when facilitating an informed, shared decision-making process for these patients within the Canadian context.*

Key words: patient decision aid, destination therapy, ventricular assist device, Canada

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Key Points

1. Patients considering a ventricular assist device for destination therapy (DT-VAD) face a complex decision.
2. Patient decision aids (PDAs) facilitate an informed, shared, decision-making process.
3. Engaging patients, caregivers (CGs), and healthcare providers (HCPs) in the process of adapting a USA developed DT-VAD PDA resource booklet for use in the Ontario context was a foundational step to evaluating the integration of the revised PDA into VAD patient care in Ontario and other provinces in Canada.

Background

Heart failure (HF) is a common, progressive illness with high symptom severity, poor quality of life (QOL), frequent hospitalizations, and high mortality (Mamas et al., 2017; Sacco et al., 2019; Tran et al., 2016). The lifetime risk of developing HF is 1 in 5, with the incidence and prevalence of HF increasing with age (Ezekowitz et al., 2017; Ziaeian & Fonarow, 2016). In Canada, approximately 670,000 people are living with HF, with a population prevalence of 3.5%, and more than 50,000 people being newly diagnosed with HF every year (Canadian Chronic Disease Surveillance System: Heart Disease in Canada, 2018; Heart and Stroke Foundation of Canada, 2016). The mortality rate for HF has been described as worse than most cancers, with a 68% mortality within five years following initial diagnosis (Mamas et al., 2017). For Ontario residents aged 40 and older, mortality within 30 days of HF diagnosis is 8.3% and 22.6% within one year (Health Quality Ontario, 2019).

Management of HF includes pharmacological and non-pharmacological intervention options to reduce patient symptoms, improve QOL, and decrease hospitalizations and mortality (Ezekowitz et al., 2017). Nevertheless, despite optimal therapy, approximately 5-10% of patients are considered to have advanced or refractory HF (Mehra et al., 2016). A highly selective group of patients with advanced HF may be considered for a left ventricular assist device (VAD) and/or heart transplantation (Hanff & Birati, 2019). A VAD is a surgically implanted mechanical pump that provides continuous support for a failing heart. These devices can be implanted as a bridge-to-transplantation (BTT-VAD) or as destination (permanent) therapy (DT-VAD; Feldman et al., 2013). Importantly, patients who choose to receive a DT-VAD will have no other treatments options. There is no turning back, as they will rely exclusively on the VAD for the rest of their lives.

While DT-VADs offer a 70% survival rate at two years and a dramatic reduction in HF symptoms (Kirklin et al., 2017), this therapy is not without serious complications, as well as life-altering lifestyle changes. Complications such as stroke, gastro-intestinal bleeding, and infection can result in hospitalizations and also can be life threatening for the VAD patient (Hanff & Birati, 2019; Kirklin et al., 2017). In addition, DT-VAD implantation is associated with significant lifestyle changes, including diligence for managing the VAD itself and incorporating the VAD into activities of daily living and leisure activities (Cook et al., 2017; Stokes et al., 2016). Furthermore, caregivers (CGs) are critical to the patient's recovery and also endure many lifestyle changes to support their loved one and the care of the VAD device (Cook et al., 2017; Stokes et al., 2016). Thus, when considering a DT-VAD, patients and their CGs must weigh the potential benefits against the potential risks and burdens associated with DT-VAD (Potapov et al., 2019).

The American Heart Association has identified that considering implantation of a DT-VAD is one of the most difficult decisions for patients living with advanced HF (Allen et al., 2012). Unfortunately, several key factors threaten the patient and CG's ability to make a truly informed decision. While many patients exclusively trust the information presented by the clinical team, those who do seek out additional information find it tends to emphasize the positive and minimize the negative aspects of a VAD implant (Blumenthal-Barby et al., 2015; Iacovetto et al., 2014). Furthermore, patients may also be experiencing depression and subtle cognitive impairment that affects their ability make an informed decision (Dew et al., 2019; MacIver & Ross, 2012). Finally, as this decision is usually made when patients have advanced HF with high symptom burden and poor QOL, they tend to dichotomize their choice as either certain death without intervention versus a chance at life with a DT-VAD (Blumenthal-Barby et al., 2015; McIlvennan, Allen et al., 2014). Therefore, the importance of guiding patients and their loved ones/caregivers to make an informed decision that is aligned with their values and goals cannot be underestimated. Healthcare providers and nurses in particular, play a central role in this shared decision-making process. Nurses have been identified as a key resource for helping them through the decision-making process by being active listeners, helping them identify their fears and concerns regarding life following VAD implantation, and providing supportive education throughout the process (Dillworth et al., 2019; McIlvennan, Matlock et al., 2015).

Patient decision aids (PDAs) are tools or resources that are designed to facilitate informed, shared decision-making in clinical practice (Stacey et al., 2017). These resources (e.g., in print/web-based materials, or videos) provide evidence-based and balanced information about available treatment options, clarify expectations about potential outcomes, help patients clarify their values, and identify the steps patients should consider so decisions are informed and aligned with their personal values (Elwyn et al., 2006; Stacey et al., 2017). Based on a systematic review of 105 trials involving 31,043 participants, Stacey et al. (2017) found that patients exposed to a PDA had better knowledge, more realistic expectations, enhanced participation in decision-making, and lower decisional conflict compared to controls. In a recent randomized controlled trial, the effectiveness of an intervention that included clinician education and DT-VAD pamphlet and video PDAs was evaluated in a cohort of patients ($n = 248$) and CGs ($n = 182$) from six geographically diverse VAD implanting centres in the USA (Allen et al., 2018; McIlvennan et al., 2018). The primary outcome was decision quality, defined as the extent to which medical decision-making reflects participant's personal values and preferences. Follow-up at one month following the PDA and shared decision-making intervention indicated that patients in the intervention group had significantly better knowledge than the control group ($p = 0.03$; Allen et al., 2018). Furthermore, at one month post enrollment, there was significantly higher concordance between stated values and treatment choice in the intervention group versus control group in both patients ($p = 0.01$) and CGs ($p = .026$; Allen et al., 2018; McIlvennan et al., 2018). Findings of this study in a DT-VAD population lend support for previous research using PDAs in a shared decision-making approach in other populations (Stacey et al., 2017).

There have been tremendous advances in VAD technology and an accompanying sustained growth in DT-VAD implants over the past two decades in the USA (Han et al., 2018; Kirklin et al., 2017). For example, the USA reports more than 22,000 VAD implants in the past 10 years of which approximately 50% have been for destination therapy (Han et al., 2018; Kirklin et al., 2017). While uptake of DT-VADs in Canada does not reflect the dramatic increase experienced in the USA (Ducharme et al., 2015; Trillium Gift of Life, 2017), public funding for BTT-VAD implants was extended to include public funding for DT-VAD implants in 2017 in Ontario (Trillium Gift of Life, 2017). Prior to 2017, DT-VAD implants were financed through alternative hospital funding resources. In response to the 2017 public funding announcement for DT-VAD implantation, it is anticipated that these volumes will dramatically increase in Ontario over the next few years (Health Quality Ontario, 2016; Trillium Gift of Life, 2017). Therefore, there is an urgent need for PDAs to support patients and their CGs who are facing this complex decision in Ontario. During a national networking meeting of VAD coordinators from across Canada in 2017, the urgent need for an evidence-based PDA that reflected the Canadian context was identified (First Canadian VAD Coordinators Workshop: Long-Term VAD Therapy: Implications for Practice, St. Paul's Hospital, Vancouver, BC, Oct. 20, 2017).

In response to the public funding announcement for DT-VAD implantation in 2017, and the subsequent anticipation of increased numbers of DT-VAD implants in Ontario (Health Quality Ontario, 2016), the Ministry of Health and Long-Term Care (MOHLTC) in Ontario mandated CorHealth Ontario, in collaboration with The Trillium Gift of Life, to lead several provincial health system initiatives to address DT-VAD health system planning. To inform this work, a DT-VAD provincial task group of key stakeholders, including clinicians, patients, and health administrators, was established in 2017. One of the initiatives mandated by the MOHLTC was to develop a PDA to support an informed, shared decision-making process for patients eligible for DT-VAD and their CGs.

Methods

Purpose

The aim of this quality improvement (QI) project was two-fold: 1) to produce a revised/adapted version of the existing USA developed PDA booklet for DT-VAD implantation (USA DT-VAD PDA) and 2) to identify considerations for its implementation to support a shared decision-making process in Ontario, Canada. This project was embedded within the work led by CorHealth Ontario and followed their framework for the development of documents and resources (CorHealth Ontario, 2017).

Design

Using a mixed methods approach, participants were invited to complete a 7-item PDA acceptability questionnaire of the USA DT-VAD PDA and participate in a semi-structured interview to identify key:

- areas for adaptation of the existing USA DT-VAD PDA to reflect the Ontario experience; and
- considerations for implementation of a DT-VAD PDA to facilitate a shared decision-making process in Ontario, Canada.

Ethical Considerations

This QI project was conducted by CorHealth Ontario, an organization that uses data and evidence as the foundation for all decision-making and advises the MOHLTC, health system stakeholders, hospitals, and care providers to improve the quality, efficiency, accessibility, and equity of cardiac, stroke and vascular services for patients across Ontario (www.corhealthontario.ca). To ensure ethical principles were strictly followed, the CorHealth team sought advice from an ethical review board and followed recommended procedures. The recruitment and verbal consent script was developed using the framework from an ethical review board at McMaster University in Hamilton, Ontario (https://hireb.ca/forms-downloads/).

Setting and Sample

Currently, there are three DT-VAD implanting programs in Ontario, including Ottawa, Toronto, and London. Care for patients at these centres is provided by a highly specialized interprofessional team and spans the trajectory from the consideration for transplant and VAD therapy to life-long follow up. Between April 1, 2017 and March 31, 2019, 62 VADs were implanted in Ontario, of which 20 were identified as DT-VAD at the time of implant (personal communication, Trillium Gift of Life).

Eligible participants included: Ontario VAD program patients (age 18+ years) living with a DT-VAD, their primary CGs (age 18+ years), and interprofessional healthcare team members at each of the three Ontario VAD programs and involved in the care of patients eligible-for and living-with a DT-VAD. Patients actively involved in the process of VAD assessment were not considered for recruitment as this process can be long, and patients may be at different stages of the decision-making process. With the very tight timelines set by the MOHLTC for this project, we excluded patients pre-VAD to minimize variability in the final cohort, and because of the small sample size of this cohort. All eligible participants post DT-VAD were invited to participate. Interviews continued until all interested parties had participated during the duration of the project.

The USA Developed Patient Decision Aid

The template USA DT-VAD PDA used in our project was developed, implemented, and evaluated by a interprofessional team of clinicians and researchers at the University of Colorado's Program for Patient Centered Decisions (https://patientdecisionaid.org/lvad/). Development of the USA DT-VAD PDA included a systematic review of the literature (McIlvennan, Magid, et al., 2014), environmental scan (Iacovetto et al., 2014), and a needs assessment of: (1) patients (McIlvennan, Allen, et al., 2014), (2) caregivers (McIlvennan, Jones, et al., 2015), and (3) VAD coordinators (McIlvennan, Matlock, et al., 2015). The framework of the draft USA DT-VAD PDA was consistent with the Ottawa Decision Support Framework (Thompson et al., 2015). Alpha-testing of the draft USA DT-VAD PDA was conducted with patients, CGs, and clinicians (Thompson et al., 2015).

The final USA DT-VAD PDA package includes a 26-minute video and an 8-page informational booklet (https://patientdecisionaid.org/lvad/). According to the International Patient Decision Aid Standards (IPDAS; http://www.ipdas.ohri.ca/), the booklet meets all of its qualifying criteria (7 of 7) and effectiveness criteria (2 of 2), and 8 of 9 certification criteria. Written permission was obtained from the PDA developers to use these materials for our QI project (Personal communication, Dr. Larry Allen, August 28, 2018).

Instrumentation

Interview Guides

Separate interview guides were developed for patients with DT-VADs and their CGs and for HCPs. The interview guides were developed by the authors (KBL, KH, JM, KH, JL, AH), informed by the Ottawa Decision Support Framework (https://decisionaid.ohri.ca/odsf.html), and inspired by the guides used for the development of the USA DT-VAD PDA (McIlvennan, Allen, et al., 2014; McIlvennan, Jones, et al., 2015). The patient/CG interview guide included nine questions, which aimed to elicit their impressions of the PDA and recommendations for changes/additions (e.g., *What did you like/didn't like about the decision aid?; What additions or changes could be made to ensure the patient decision aid is more useful?*). Similarly, the 16-item HCP interview guide prompted participants to share their thoughts about the PDA and their recommendations for adaptation (e.g., *Is there anything about the decision-making process around DT VAD that should be captured in a PDA like this one?)*. In addition, the HCP participants were asked questions related to considerations for implementation of an adapted version of the PDA to facilitate a shared decision-making process (e.g., *What would make it easy/difficult to implement this patient decision aid in your clinical practice?*).

PDA Acceptability Questionnaire

The 7-item PDA acceptability questionnaire was developed by the authors (KBL, JM) as guided by questions extensively used for PDA acceptability developed by O'Connor and Cranney (2002). Items were modified to fit the context of the USA DT-VAD PDA to elicit participants' perspectives on the following: 1) comprehensibility of the PDA components, 2) length, 3) amount of information, and 4) overall balance of the PDA's presentation of the available treatment options.

Data Collection

Data was collected between October and December, 2018. Patients and CGs were approached by a HCP who was part of the VAD program but not directly involved in the QI project and asked if they would be interested in participating in our QI project. Using a standardized script, participants were informed verbally and in writing about the project, including the purpose, time commitment, anonymity, confidentiality, and the right to withdraw at any time. Following verbal consent, patients and their CGs, and HCPs on the VAD team were contacted by a member of the research team (KBL, JM) to confirm interest in participation. Prior to the interview, all participants were asked to review both the USA DT-VAD PDAs (i.e., booklet & video), and complete the 7-item PDA acceptability questionnaire.

Interviews were conducted either in-person, in a private space chosen by the participant, or by telephone. Interviews were completed by two co-authors, who are PhD-prepared nurses with experience in qualitative interviewing and analysis (KBL and JM); one with expertise in the patient population (JM), the other with expertise in PDAs and shared decision making (KBL). These nurses were not part of the patients' care team. With participants' verbal consent, interviews were audio recorded; audio recordings were transcribed, cleaned, and de-identified by a transcriptionist with *Personal Health Information Act* (PHIA) certification. To maintain anonymity in the small eligible sample, demographic information was not collected.

Data Analysis

Microsoft Excel© and Microsoft Word© programs were used for all data organization and management. Quantitative data from the 7-item acceptability questionnaire were analyzed using frequency counts. The qualitative data analytic team consisted of the PhD-prepared nurses who completed the interviews (JM, KL). Thematic analysis was utilized to identify, analyze, consolidate, and finalize themes (Braun & Clarke, 2006; DeCuir-Gunby, 2011) that informed the resulting adaptations to the PDA and revealed considerations for implementation in routine clinical practice.

Suggested modifications to the USA DT-VAD PDA identified by participants in the interviews were mapped to each topic within the booklet and video. PDA revisions/amendments derived from the findings of the quantitative and qualitative data were used to guide development of a revised version of a PDA booklet. Multiple draft versions of the booklet were reviewed by the members of the DT-VAD provincial task group until no further edits were identified. In collaboration with the CorHealth team, including two co-authors (KH, JL), the findings were then summarized into considerations for implementation of the PDA into an informed shared-decision-making process for patients and their CGs considering DT-VAD implantation.

Results

During the data collection period, 11 people were living with a DT-VAD that was implanted within Ontario's VAD programs. From an initial seven patients who expressed interest in the project, one patient died before contact, one declined participation, and two did not respond to the invitation. Three patients with a DT-VAD and two associated CGs were interviewed. Thirteen HCPs were interviewed, including heart function specialists, cardiac surgeons, palliative care physicians, VAD nursing coordinators, advanced practice nurses, nurse practitioners, and allied health members of the VAD team (e.g. social worker, psychologist, perfusionist). All participants (N = 18; 3 patients, 2 CGs, 13 HCPs) reviewed the PDA materials and 14 participants (3 patients, 2 CGs, 9 HCPs) completed the PDA acceptability questionnaire.

PDA Acceptability Questionnaire

Of the 14 participants who completed the PDA acceptability questionnaire, 10 reviewed the booklet and video and 4 participants reviewed the PDA booklet only. All participants indicated that the PDA resources were useful for patients or CGs when facing a decision regarding DT-VAD implantation and most (i.e., 13 of 14) indicated that the information was understandable.

Three patients/caregivers indicated that the PDA resources '*provided just the right amount of information,*' but they also provided additional feedback that it was enough information for 'initial learning' or 'to explain aspects of the decision.' Only one patient/CG indicated that the PDA resources '*provided enough information to help a person decide.*' Eight HCPs indicated that the PDA resources '*provided just the right amount of information*' to support decision-making and the PDA resources '*provided enough information to help a person decide.*' Nevertheless, some HCPs commented that the PDA resources should be supplemented with other resources and '*should not replace current education or face-to-face discussions.*'

When asked if they felt the information presented the options (i.e., DT-VAD vs medical management) in a balanced way, six participants (3 patients/CGs & 3 HCPs) indicated that the material was '*slanted to decline a DT-VAD,*' three participants (1 patient/CG & 2 HCPs) indicated that it was '*slanted to accepting a DT-VAD,*' and five HCPs felt the material presentation was well balanced.

PDA Booklet Recommended Revisions/ Adaptations

Many of the recommended revisions were changes to a single word (e.g., changed '*surgery is dangerous*' to '*surgery is risky*'), or rephrasing information (e.g., '*you must be plugged into a power source at all times- loss of electrical power to the pump can result in death*' changed to '*you must have a power source at all times*'). Patient participants were unclear about the section on 'hospice care;' therefore, this was replaced with a section labelled 'palliative and supportive care,' which includes end-of-life considerations. Attention to possible 'financial costs' post DT-VAD implantation such as travel back to the implanting site, accommodation near the implanting site, dressing supplies, and medications were added, as requested by patients and CGs. Participants also suggested adding more culturally diverse patient/CG illustrations in the booklet. There was a particular appreciation by patients and CGs for the caregiver-related content and considerations. All suggestions were used to inform the initial draft of the revised/adapted PDA booklet. Additional edits requested by the DT-VAD task group were primarily directed at reaching consensus on the values and formatting of the risk/benefits for each of the DT-VAD and medical management options.

PDA Video Resource

This project was not resourced to develop a new video to supplement the revised/adapted PDA booklet; however, participants who viewed the video indicated that the USA developed video was helpful and suggested a simple instruction page to highlight the obvious differences between the Canadian and USA health care settings. For example, one of the HCP participants noted that the attention to hospice care "*is out of context to the Canadian palliative care system.*"

Implementation Considerations

Most HCP participants reportedly felt that the PDA booklet and video could support their conversations with patients and CGs facing a DT-VAD decision. HCPs raised few concerns when asked about the implementation of the PDA in the clinical workflow. In fact, they were not worried about time constraints, a frequently cited barrier for PDA implementation (Elwyn et al., 2006; Légaré & Thompson-Leduc, 2014), as they believed the PDA may help facilitate what is already a difficult, time-consuming conversation.

Three key recommendations for implementation of the revised DT-VAD PDA emerged from the interviews:

1. PDA resources need to be provided early in the decision-making process. Patients/CGs indicated that it would be good to have "*something like this at the beginning of the LVAD journey,*" or when it has been "*suggested that this is an option for you.*" Similarly, HCPs felt that "*the earlier they have it, probably the better*" as "*they need time to digest it*" and "*they realize they actually need to make a decision.*"
2. All members of the healthcare team in the VAD program have a responsibility to support patients and CGs during the decision-making process. Healthcare provider participants felt that the PDA resources could be used to "*help cue us*" to ensure patients and CGs have the information they need to guide an informed decision. When reviewing the topics in the PDA with patients and CGs, HCPs can explore "*what they (patients/CGs) have been told about*" as they strive to assess what patients/CGs understand about their treatment options and provide clarification as needed.
3. Additional resources should supplement the PDA booklet and video to facilitate an informed, shared decision-making process. Patients/CGs suggested that information, such as simple summary of information regarding the VAD program's follow-up schedule is needed as "*there is a lot of travel and expense*" when they are required to return to the VAD implanting centre for VAD-related appointments. Patients/CGs also suggested that they should be offered the opportunity to "*talk to somebody that's already got one*" as a way "*to shed light on the reality of living with a LVAD*" during the decision making process.

These recommendations were incorporated into the revised/adapted PDA. Following the review of multiple drafts by the members of the DT-VAD provincial task group, the final DT-VAD PDA booklet entitled, "Considering a Left Ventricular Assist Device- A Conversation Guide for Patients and Caregivers" was completed and is now freely available on line at https://www.corhealthontario.ca/Considering-a-Left-Ventricular-Assist-Device-Conversation-Guide-for-Patients-and-Caregivers.pdf.

Discussion

There is little doubt that considering a DT-VAD is a complex decision and that PDAs are effective tools to facilitate the decision-making process and improve decision quality for patients and their CGs (Allen et al., 2018; McIlvennan et al., 2018; Stacey et al., 2017). This project engaged patients living with a DT-VAD, their CGs, and members of the VAD healthcare team in a process to adapt a well-established USA developed DT-VAD PDA to the Ontario setting. Insights gleaned from participants have been included in an adapted PDA booklet, which is now available electronically for use in Ontario https://www.corhealthontario.ca/Considering-a-Left-Ventricular-Assist-Device-Conversation-Guide-for-Patients-and-Caregivers.pdf. In addition, HCP support for the implementation of this resource into the current decision-making process for DT-VAD patients and their families was evident in our findings.

Helping patients and their CGs understand how their lives are going to change after they receive their DT-VAD is challenging, but critical to enabling an informed decision-making process. The revised PDA can be used as a resource to enhance conversations between HCPs, patients, and CGs by providing clear information about risks and benefits, the reality of living with a VAD, the role of the CG, and palliative and supportive care considerations. The PDA also includes worksheets to help patients and CGs reflect on what they value and what they hope for as they consider life with or without a VAD. This clarity and opportunity for reflection is especially important when patients and their CGs may have a different understanding or perceptions on the benefits/risks or lifestyle changes between treatment options (Hoefel et al., 2020). Patients and families often exhibit their unique decisional needs, fueled by feeling uninformed and having unclear personal values (Hoefel et al, 2020).

This PDA, which includes information and considerations for both patients and the CGs, may help to address these different and role-dependent informational needs and valued outcomes by providing insight into the lifestyle changes and critical role of CGs following DT-VAD implantation. For example, patients need to consider how treatment options will impact their basic activities of daily living, while CGs need to think about how treatment options will impact their roles and responsibilities to support their loved one and how this will affect their own lives.

Given the complexity of the decision and the need for well-balanced and informative decision-making support for patients and CGs, HCPs need to ensure that these PDAs are offered in a timely manner (e.g., as soon as they are clinically eligible for a DT-VAD). Patients and CGs need adequate time to consider their options, in both non-acute and high-acuity/life threatening situations. If the patient is too unwell to engage with HCPs, the PDAs should be offered to family members and/or substitute decision makers. While patients, CGs and HCPs indicated that the PDA had a '*right amount of information,*' findings from comments on the PDA questionnaire and participant interviews indicate that the PDAs should not be used in isolation, but rather embedded within a suite of interventions (e.g. face-to-face discussions, peer-to-peer opportunities) to support patients and their CGS in the decision-making process.

Unlike many places in the USA, DT-VAD implant volumes in Ontario, Canada are conservative, but are expected to rise with the change in funding policy in 2017. Resources to support this patient population that are relevant to the local context are limited (CorHealth Ontario, 2019). Nevertheless, the impact on patients and their CGs considering DT-VAD cannot be underestimated; therefore, appropriate and accurate PDA resources are critical to supporting patient- and family-centred care.

Implications for Nursing

As part of the interprofessional team that supports patients and their CGs, nurses play a critical role in the shared DT-VAD decision-making process. A systematic review of the barriers and facilitators to patients' involvement in shared decision-making (N = 44 studies) revealed that patients consider nurses to be 'mediators' of information, listeners of patients' preferences, and messengers of expressed preferences to the physicians ultimately responsible for implementing the decision (Joseph-Williams, 2014). Hence, nurses are well-positioned and able to proficiently and independently support patient engagement in DT-VAD decision-making by informing patients of their options and the nuances of those options.

Engagement in shared decision-making education is a predictor of shared decision-making in clinical practice (Légaré et al., 2014). Therefore, the entire VAD HCP team needs to seize opportunities to build on these skills, as well as risk/benefit communication and ensure consistent messaging from all team members for patients and their CGs. These skills are especially important for nurses because they are often the most frequent point of contact for VAD patients and their families; they provide a substantial amount of patient education and support, and often coordinate care throughout the patient journey from consideration for DT-VAD to end of life (Dilworth et al., 2019; McIlvennan, Matlock et al., 2015). With knowledge and clinical skills related to decisional support, VAD program HCPs will be well positioned to assess, adapt, implement, and evaluate PDAs, such as our revised DT-VAD PDA resource in the broader Canadian context.

Limitations

The number of patients and CGs eligible for this project was limited due the low volume of DT-VAD implants in Ontario and a provincial versus national recruitment approach. Nevertheless, participants provided insightful suggestions and recommendations to guide PDA adaptations and the decision-making process that reflect our province's context and may also be relevant to patients and CGs in the larger Canadian context. Although it was not within the scope of this project to include patients who declined a DT-VAD, development of the USA DT-VAD PDA included consults with patients and their CGs who both accepted and declined a DT-VAD (Allen et al., 2018; McIlvennan et al., 2018).

Conclusion

Patients and their CGs considering a DT-VAD face a difficult and complex decision. Healthcare providers, and nurses in particular, are central to informed, shared decision-making. This decision-making process is facilitated by DT-VAD PDAs that include information that is relevant to the process and appropriate to the context of their VAD program. In this QI project we engaged patients, CGs, and HCPs to accomplish the goal to produce a revised/adapted version of a USA DT-VAD PDA for use in the context of VAD programs in Ontario, Canada. Our project also establishes the foundation for implementing and evaluating this revised PDA within the broader Canadian context and potentially filling an obvious void for nurses when supporting patients and their CGs condsidering DT-VAD implantation.

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A Retrospective Study of a Home Visiting Program for Patients with Heart Failure

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Abstract

Background: *Heart Failure (HF) patients are at high risk for hospital readmissions related to their condition.*

Purpose: *To determine if home visits by a cardiac nurse clinician reduced the primary outcome of 30-day HF-related readmissions, as well as all-cause or emergency room admissions, and increased referral rates for cardiac rehabilitation.*

Method: *We used a retrospective chart review to compare a randomly selected, usual care group of patients (n = 112) hospitalized for HF between 2009 and 2011 with a group of patients (n = 103) hospitalized for HF who had home visits by a cardiac nurse clinician between 2011-2013.*

Findings: *The home visit group had significantly fewer readmissions for HF and more referrals to cardiac rehabilitation than the usual care group ($p < 0.001$).*

Conclusion: *This study, the first of its kind in Canada, provides support for programs that integrate nurse-led transitional care strategies to improve HF patient outcomes.*

Key words: *heart failure, readmission, nursing roles, transitional care, home visits*

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Key Highlights

- No quantitative published studies to date examine the relationship between home visits by cardiac nurses and outcomes for heart failure patients in a Canadian context.
- The home visit group had significantly fewer readmissions for heart failure and more referrals to cardiac rehabilitation than the usual care group.
- Adjustment using logistic regression showed that receiving home visits by a cardiac nurse clinician was associated with 10-fold higher odds of being referred to a cardiac rehabilitation program.
- This study, the first of its kind in Canada, provides support for programs that integrate nurse-led transitional care strategies to improve heart failure patient outcomes.

Background

Heart failure (HF) is a chronic and progressive condition that develops from the damaging or weakening of the heart, and can result in serious life-threatening conditions that require hospitalization (Heart and Stroke Foundation Canada [HSFC], 2020). It is estimated that there are at least 26 million people worldwide who have HF (Savarese & Lund, 2017; World Heart Federation, 2020). Approximately 600,000 people in Canada are affected by HF, costing the Canadian healthcare system $2.8 billion annually (HSFC, 2016; Virani et al., 2017). These costs are, in part due to recurrent hospital readmissions where 25% of HF patients are readmitted within 30 days of being discharged (Greene et al., 2015; Virani, 2020). Patients with HF have the highest readmission rates among medical patients (Heart and Stroke Foundation, 2020; Tran et al., 2016; Virani, 2020) for many cardiac and noncardiac reasons (Greene et al., 2015). One reason is due to insufficient care provision during the transitional phase from hospital to home, often deemed "the vulnerable phase" for those with HF (Greene et al., 2015, p.1; La Rovere & Traversi, 2019). Risk of readmission may also be exacerbated by factors such as being ill-prepared for discharge, feeling overwhelmed and stressed with the diagnosis, and the complexity of medications, as well as the risk of further symptom appearance. Thus, transitional initiatives such as home visiting are a topic of particular interest for patients with HF, given the potential to reduce healthcare costs and improve health-related outcomes.

Previous research has examined the effect of home-visiting interventions on health outcomes for HF patients, specifically in suggesting that home visits by healthcare professionals including nurses, (Feltner et al., 2014; Stewart, 2004) pharmacists, or physicians could decrease readmissions and subsequently result in reduced healthcare costs and improved inpatient bed availability (Holland et al., 2005; Jaarsma et al., 2013; Leff et al., 2005; Stewart, Marley et al., 1999). In a systematic review and meta analysis of transitional care interventions to prevent readmissions for individuals with HF, Feltner et al. (2014) found that high-intensity home-visiting programs reduce all-cause readmissions and deaths in the first 30 days following discharge from hospital. Similarly, a systematic review of six randomized control trials (RCTs) published between 2006 and 2012 demonstrated that care in the home for patients with HF was associated with a reduction in mortality, hospitalizations, and costs to the healthcare system (Fergenbaum et al., 2015). Randomized control trials of home visits for HF patients have also demonstrated reduced readmissions and out-of-hospital deaths, for up to six months after discharge (Blue et al., 2001; Stewart, Marley et al., 1999). Stewart et al.'s (2016) composite analysis of three RCTs and 1,226 patients with varying cardiac diagnoses, including HF, found that the home visit intervention group lived longer and had fewer all-cause hospitalizations than the non-intervention group. Many of these studies included only those patients who suffered from reduced ejection fraction HF and not those who had preserved ejection fraction HF, structural abnormalities, had undergone cardiac surgery, or were awaiting cardiac surgery. Similar limitations existed in other studies (Stewart & Horowitz, 2002; Stewart, Marley et al., 1999; Stewart, Vandenbroek et al., 1999).

A variety of healthcare providers can provide home visits, but most often these providers are nurses, potentially due to their services being cost-effective, their ability to provide holistic and comprehensive care, and given these types of services are well within nurses' scope of practice. Patient education by specialized HF nurses is an excellent strategy to reduce HF-related readmissions to hospital (HSFC, 2016). Fergenbaum et al.'s (2015) systematic review suggests that home care interventions for HF patients, which were most often implemented by nurses, were more effective and less costly than usual care. Similarly, one multicentre RCT found that home-based interventions by HF specialist nurses were associated with fewer days in hospital and lower accrued costs compared to a clinic-based intervention (Stewart et al., 2012; Stewart et al., 2014). As well, Echeverry et al.'s (2015) study demonstrated that home visits by a nurse practitioner reduced hospital admissions, emergency room visits, and 30-day re-admission rates by 64%, 85%, and 95% respectively.

Similar studies to those aforementioned have taken place in Australia, Scotland, and the United States. No quantitative published studies to date examine the relationship between home visits by cardiac nurses and outcomes for HF patients in a Canadian context. Using a retrospective cohort study design, we examined outcomes of an existing nurse-led home visiting intervention in the province of British Columbia. We compared patient outcomes for individuals who were referred to a home-visiting program, initiated in 2011, with the 'usual care' group consisting of HF patients hospitalized before 2011. We hypothesized that patients with underlying HF, regardless of the etiology, could benefit from home visits by a cardiac nurse.

Theoretical Framework

Meleis' (2011) Transitions Theory guided the overall rationale and design for our study. Meleis (2011) states, "Transitions are triggered by critical events and changes in individuals or environments" (p. 11). Transitions Theory describes various types of life transitions that human beings experience, including the common transition patients progress through when they return home following hospital discharge (Meleis, 2011). Nurses have the skills and the ability to reduce patients' sense of role insufficiency during life transitions (Meleis, 2011). According to Meleis (2011), 'nursing therapeutics' or rather, nursing actions assist the patient to move through life transitions. These nursing actions include assessing for the type of transition, role supplementation, creating healthy environments, and resource allocation (Meleis, 2011). Transitions Theory is particularly relevant and fitting in today's healthcare climate, with the increasing risk of maladaptive transitions for patients due to shorter hospital stays, and the demand for creative strategies to improve patient outcomes and reduce healthcare costs.

Methods

Aim

The purpose of this study was to determine if home visits by a cardiac nurse clinician were associated with reduced HF readmissions in an urban community hospital site in Western Canada. The specific research question was: Is there a relationship between home visits by a cardiac nurse clinician and the number of HF-related readmissions, as well as all-cause readmissions, length of stay during readmissions, number of emergency visits, and proportion of cardiac rehabilitation referrals?

Readmission within 30 days of hospital discharge for HF was the main outcome of interest. The 30-day time is a benchmark outcome used by both Canadian and American researchers (Canadian Institute of Health Information [CIHI], 2018; Kromholz et al., 2013) and was, thus, chosen for this study. Heart failure readmission was examined as both a dichotomous variable (yes/no) and a continuous variable to measure the frequency of HF readmissions in each group. Secondary outcomes of interest included all-cause readmissions, length of stay during readmissions, emergency department visits, and referrals to cardiac rehabilitation.

Research Design

We used a retrospective cohort study design with a chart review to examine the effect of home visits on HF patients who were discharged from hospital. The University of British

Columbia Behavioral Research Ethics Board and Vancouver Coastal Health Authority approved all procedures prior to data collection. We examined outcomes among usual care and intervention groups of patients with HF.

Sample and Setting

The setting was one urban community hospital site in British Columbia. An *a priori* power analysis was conducted with a 5% level of significance, 80% power, and effect size of 0.40. The total sample size of 215 was needed to detect a statistically significant difference between the two groups for the dependent variables of HF and all-cause readmissions to hospital. Patients were eligible for inclusion based on the following criteria: 1) ≥ 18 years; 2) admission to study hospital and/or intervention program from August, 2009-September, 2013; 3) diagnosis of HF; and 4) resident of British Columbia.

Group Assignment

Usual care group. The usual care group consisted of a random sample of patients who had been hospitalized for HF in the study site facility between August 2009 and September 2011.

Intervention group. The intervention group consisted of all patients who had been hospitalized for HF in the study site hospital, admitted to the home visit program, and received home visit(s) by the cardiac nurse clinician between September 2011 and September 2013.

Intervention

The goals of the intervention were to promote self-management skills through patient assessment, education, and nursing intervention accordingly to reduce risk of readmission and maximize quality of life. The procedure manual for the intervention indicated that each home visit should be comprised of a full head-to-toe assessment, vital signs, baseline electrocardiogram on first visit and further electrocardiograms with a change in health status, and patient teaching to increase self-management skills. Patients received information booklets from the Heart and Stroke Foundation, such as *Recovery Road,* or *Living With Congestive Heart Failure*. The topics covered for patient teaching sessions consisted of medication management, signs and symptoms of HF, daily weights, fluid restriction, low-sodium diet, lifestyle factors, and activity progression. Follow-up appointments with specialists or primary care physicians, and referral to cardiac rehabilitation and other community programs were also arranged during the intervention visit.

The two intervention nurses had specialty training and experience in cardiology, as well as cardiovascular certification from the Canadian Nurses' Association. Referrals to the intervention program came from the study site hospital and nearby tertiary care hospitals that discharged patients who lived within the catchment area. Each patient received one visit per week until the patient was medically stable, with no new HF symptoms, and vitals signs within stable range. Patients also must have met the self-management goals of taking medication correctly and understanding lifestyle management skills for HF. More than one visit per week was arranged if the patient was experiencing complications or symptoms. Patients were made aware that they could contact the intervention program for any health-related concerns even after they had been discharged from the program. If a patient was readmitted to hospital after discharge from the intervention program, then the home visits commenced again upon discharge from hospital. The intervention included communication with the patients' physicians, as necessary, based on the nurse clinician's assessment. The specialist and family physician both also received a discharge summary when the home visits ceased and the patient was medically stable. On average, each person received three home visits.

Data Collection Procedures

Hospital support staff transcribed all the HF discharges from September 2009 to August 2011 (n = 515) onto a spreadsheet for the usual care group. From this dataset, we randomly chose 112 patients using a list of numbers generated from the Research Randomizer website (https://www.randomizer.org) and matched the number to the appropriate row on the spreadsheet. The intervention group consisted of consecutive HF patients discharged between September 2011 and September 2013, as there were only 113 patients who were admitted to the intervention program during the study timeframe. Data for the usual care group were extracted from the hospital's records and from home visiting program records for the intervention group. All data extraction was completed by co-author JK.

Verification of HF was based on the diagnosis in the discharge abstract or chart, along with laboratory (i.e., brain natriuretic peptide level) and clinical (i.e., chest x-ray) data. The electronic database Care Connect or the actual medical chart was used to determine if the patient was readmitted to hospital or the emergency department within 30 days of discharge and whether a referral to cardiac rehabilitation was ordered.

Statistical Analysis

Descriptive statistics characterize the study sample. We examined whether there were differences between the groups using the appropriate bi-variate tests (e.g., Chi-square, t-test, Mann-Whitney U). Multiple regression was used to examine the relationship between home visits and the frequency of HF readmissions. Logistic regression was performed to determine whether the relationship between the intervention and cardiac rehabilitation referrals remained statistically significant, after controlling for potentially confounding variables. Level of significance was < 0.05. All analyses were performed using IBM SPSS V21.0 and V24.

Results

A total of 215 reviewed patient charts (usual care = 112; intervention = 103) were included in the study (Table 1). Ten patients in the intervention group were eliminated, as they did not meet the study criteria (i.e., hospital admissions before September 2011 or after September 2013). The main language spoken by participants was English and the distribution of men to women participants between groups was not statistically significant (Table 1). The usual care group was significantly older (82.7 ± 10.15 years) compared to the intervention group (78.0 ± 11.6 years, $p < 0.05$). Clinical characteristics were fairly similar between the two groups (see Table 2). Exceptions included that significantly more intervention group patients had a documented history of hypertension, myocardial infarction, and percutaneous coronary intervention ($p < 0.001$).

Although there were no statistically significant differences in HF-related discharge prescriptions (i.e., Beta blockers, angiotensin-converting-enzyme inhibitors; angiotensin II receptor blockers; mineralocorticoid receptor antagonists) in the usual versus intervention group participants, significantly more discharge prescriptions were missing from the medical records of the usual care group ($p < 0.001$). No significant differences between the groups were found between all-cause readmissions, length of stay of all-cause readmissions, or all-cause emergency visits. However, the intervention group had fewer 30-day readmissions for HF ($p < 0.001$) and a higher number of documented cardiac rehabilitation referrals ($p < 0.001$).

The adjusted multiple regression model showed that home visits by a cardiac nurse clinician were associated with lower HF readmissions ($p < 0.01$; Table 3). Adjustment using logistic regression also showed that receiving home visits by a cardiac nurse clinician was associated with 10-fold higher odds of being referred to a cardiac rehabilitation program (OR 9.78, 95% CI: 1.96 - 48.07; Table 3). It is noted that patients who were referred to cardiac rehabilitation were significantly younger than those who were not referred to cardiac rehabilitation (OR 0.91. 95 % CI: 0.87-0.96; Table 3).

Table 1. Demographic Data

Variable	Group	
	Usual Care *n* = 112	**Intervention *n* = 103**
Women, *n* (%)	61 (54)	46 (45)
Age years (mean ± SD)	82.7 ± 10.2	78.6 ± 11.6*
Lives alone, *n* (%)	46 (41)	39 (22)
English speaking, *n* (%)	108 (96)	98 (95)

Note. * p <0.05

Table 2. Clinical Characteristics

	Group	
	Usual Care *n* = 112	**Intervention *n* = 103**
Cardiac Conditions		
Coronary Artery Disease	46 (41)	55 (53)
Atrial Fibrillation	64 (57)	53 (51)
Hypertension*	43 (38)	63 (61)*
Myocardial Infarction*	19 (17)	39 (40)*
PCI***	4 (4)	24 (23)***
CABG	14 (13)	12 (12)
Aortic Stenosis	18 (28)	22 (23)
Mitral/tricuspid Valve Insufficiency	29 (42)	31 (32)
Reduced left ventricular EF: median (IQR)	30 (22, 55)	40 (25, 60)
Preserved EF	24 (40)	41 (42)
Co-morbidities		
Diabetes	23 (20)	33 (32)
Hypercholesterolemia	24 (21)	33 (32)
Chronic Kidney Disease	4 (4)	24 (23)
COPD	14 (13)	12 (12)
Cancer	11 (10)	7 (7)
Cerebral Vascular Accident	14 (13)	14 (13)
Hypercholesterolemia	24 (21)	33 (32)
Osteoporosis	8 (7)	7 (7)
Discharge Laboratory Values		
Hemoglobin (ref: 135-170 g/L), mean ± SD	114 ± 19	121 ± 20
Creatinine (ref: 60-100 mmol/L), median (IQR)	125 (82, 88)	105 (92, 131)
Sodium (ref: 135-148 mmol/L), median (IQR)	138 (137, 140)	105 (96, 131)
Hospitalization		
Length of stay index admission, median (IQR)	4 (1, 95)	5 (1, 23)

Note. CABG = coronary artery bypass graft; PCI = percutaneous coronary intervention;
COPD = chronic obstructive pulmonary disease; EF = ejection fraction
* $p < 0.05$, *** $p < 0.001$

Table 3. Regression Models for HF Readmissions and Cardiac Rehabilitation Referrals

Variable	Heart Failure Readmission			Cardiac Rehabilitation Referrals			
	B	95% CI		B	OR	95% CI	
Group***	- 0.19	-0.08	-0.30	2.28	9.78	1.96	48.07
Age***	- 0.010	-0.006	0.004	-0.09	0.91	0.87	0.96
Previous MI	0.10	-0.03	0.29	3.27	0.71	0.22	2.32
PCI	- 0.08	-0.25	0.09	0.69	2.00	0.55	7.20
Hypertension	- 0.009	-0.111	0.091	-0.17	0.53	0.97	2.95

Note. B = beta; SE = standard error; CI = confidence interval; OR = odds ratio;
MI = myocardial infarction; PCI = percutaneous coronary intervention
*** $p < 0.001$.

Discussion

We examined a nurse-led home visit program for patients with HF in an urban community hospital site in western Canada. Home visits by a cardiac nurse clinician were inversely associated with the primary outcome of HF hospital readmissions. Although we did not find a signficant relationship between the home visit intervention and all-cause readmissions, length of stay during a readmission, or visits to the emergency department, those who received a home visit had significantly fewer HF-related readmissions and were more likely to be referred for cardiac rehabilitation, compared to those who received usual care. The findings related to 30-day HF readmissions are consistent with previous studies of nurse-led home visit interventions conducted in other countries (Blue et al., 2001; Stewart & Horowitz, 2002; Stewart, Marley et al., 1999; Stewart, Vandenbroek, 1999).

In our study, participants who received a home visit by a cardiac nurse clinician were more likely to be referred to a cardiac rehabilitation program, compared to those who received usual care. We are not aware of any previous research studies that have examined any particular aspect of the nursing intervention that could be a factor in preventing readmissions, including referral by nurses to a cardiac rehabilitation program. Community resources and programs can provide additional support to healthcare practitioners in managing chronic disease (Bodenheimer et al., 2002).

Cardiac rehabilitation is not as well utilized by HF patients as in other cardiac patients because of such factors age, gender, and multiple comorbidities (Golwala et al., 2015; Grace et al., 2009; Schopfer & Forman, 2016), reflecting our finding that patients who were referred to a cardiac rehabilitation program were more likely to be younger. However, the precision of this estimate is weak, as evidenced by the wide confidence interval, so this may not represent the true proportion in the population mean.

Researchers have suggested that post-discharge home visits for HF patients could have multiple benefits to the healthcare system in the form of reducing all-cause and HF readmissions (Blue et al., 2001; Stewart & Horowitz, 2002; Stewart, Vandenbroek et al., 1999; Stewart, Marley et al., 1999). It has been calculated that a reduction in readmissions for those who suffer from HF produced a cost saving of $432,300 for the Australian healthcare system (Stewart, Marley et al., 1999). Within the Canadian healthcare context, the CIHI (2018) estimated that more than $2.1 billion dollars are spent annually on hospital readmissions, including readmissions related to HF. The CIHI (2020) also reports HF as the third most common reason for hospital stays. Loosely applying this estimate to the two groups in the current study shows that there was a substantial cost saving for the system by providing patients the home visit intervention. The intervention likely saved $210,000 due to avoided readmissions for HF (i.e. $30,000 for intervention group versus $240,000 for usual care group). However, a proper cost analysis study is needed to verify our estimate of cost savings from such a program.

Limitations

There are several limitations to our study. At the time of the implementation of the home care visit program for HF patients there was no research study planned to examine the efficacy or effectiveness of the intervention. Therefore, random assignment to intervention or usual care did not take place. While our retrospective study design is not as robust as an RCT or prospective cohort study, our design did allow us to achieve an intervention and control group and, thus, examine the effect of the home care intervention on multiple outcomes. We also did not achieve adequate sample size for the intervention group because several patients who were seen by the home visiting intervention program did not meet the eligibility criteria of the study. However, our findings still showed a statistically significant difference between the two groups. This study took place at a single urban community hospital site, so generalization to a broader population may not be applicable.

In regards to the difference in HF readmissions between the two groups, there was a higher number of missing discharge prescriptions in the usual care group; not receiving evidence-based medications could increase the readmission risk. The absence of discharge prescriptions listed in patient charts could be attributed to filing or clerical error and not to prescriber omission. Additionally, the finding that the intervention group received a significantly higher number of PCIs, may be attributable to the two groups being assessed in different time frames. PCIs have become increasingly common over time, which may explain these findings.

Finally, researcher bias may have occurred, as result of the intervention nurse performing the home visits for some of the study period also being the lead investigator (JK) in the current study. Therefore, she may have gone to greater lengths to reduce readmissions with the patients with HF, knowing that the frequency of readmissions was going to be analyzed. However, between January 2013 and September 2013, a different cardiac clinician conducted the home visits, possibly attenuating this potential bias.

Implications for Nursing

Our study findings have implications for nursing practice, education, and research within the Canadian healthcare system. Nurses practising in acute care, and who are involved with preparing HF patients for discharge, could facilitate post-discharge follow-up with existing community programs and primary care providers. As outlined by Meleis' (2011) Transitions Theory, nurses play a pivotal role in assisting patients during discharge and also in the transition to the post-discharge period when the patient has returned home. The cardiac home visit nurse's role in role supplementation and reducing HF patient and caregiver role insufficiency in these transitions, as well as acting as a liaison between acute and primary care, provides continuity in an often fragmented healthcare delivery system. We recommend more nurse-led home visiting programs for those who suffer from HF but, in the absence of such programs, referrals to existing community programs could be helpful in providing support in the transitional phase post-discharge from hospital.

Meleis' (2011) theory could also provide a framework to assist nurses who care for HF patients not only in acute care, but also in the community. Transitions Theory (2011) should be discussed and integrated into practice for all nurses to increase the focus on the important role nurses have in assisting patients through critical life transitions, such as discharge from hospital. Nursing education programs could integrate Meleis' (2011) theory into the curriculum to highlight the evidence for transitional care programs for those who live with HF, and of the important role of the nurse in assisting patients through critical life transitions.

Our model of transitional care may also be beneficial for other cardiac patients who are newly discharged from hospital, such as patients who have suffered myocardial infarction or who have undergone open heart surgery. Our home visit intervention program has extended to include these cardiac patients in the transitional period after discharge from hospital. This decision was supported by previous research. For example, Stewart and colleagues (Stewart, Marley et al., 2016) suggested that a relationship exists between home visits and a reduction in hospital readmissions for those who suffer from other forms of chronic heart disease. Among cardiac patients, those who suffer from HF and acute myocardial infarction are at highest risk for readmission to hospital (House et al., 2016). Therefore, this proposed model of care could have a large impact in terms of reducing hospital readmissions through education, ongoing support, and early intervention to reduce the chances of an exacerbation of acute HF or reinfarction.

Further research is needed on the topic of home visits for individuals living with HF. A more rigorous study design, such as an RCT or interrupted time series, is needed to further test the model of cardiac nurse-led home visits in patients diagnosed with HF. A larger sample size and expanding the study criteria to patients living with other forms of cardiac disease could produce valuable data to validate our model of care. Furthermore, expanding study outcomes to mortality rates and a cost analysis is also needed to further test this model of care. Qualitative studies focusing on the transitional period from hospital to home for HF patients and the effects of a home visit program would also be valuable in exploring the experiences of both patients and their families.

Conclusion

To our knowledge, this study is the first of its kind in Canada. This research adds to the existing evidence on the positive effects of cardiac nurse-led home visit programs for individuals with HF by providing data to support a program that seeks to integrate care across acute and primary care settings. HF patients may benefit by having this increased continuity in their transitional care, by decreasing their vulnerability to adverse events, such as readmissions during the first 30 days after discharge from hospital. Cardiac nurses can play an important role in helping to improve health and healthcare outcomes for patients diagnosed with HF.

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2020 Recipients CCCN Cardiovascular Nursing Excellence Recognition Program

Through our Cardiovascular Nursing Excellence Recognition Program, CCCN seeks to celebrate and profile Cardiovascular (CV) Nursing Excellence within CCCN. Acknowledge nurses who obtain CV certification/recertification, outstanding students who have completed a CV practicum and recognize Canadians who have advocated for CV health and/or CCCN. The 2020 awards were presented on October 1, 2020 at the CCCN Virtual Conference.

Marcie Jayne Smigorowsky, RN, PhD, NP, CCN(C)

2020 Research Excellence Award in Cardiovascular Nursing

Dr. Marcie Smigorowsky has been engaged in research since early in her career. She worked with Health Canada on a Heart Health promotion community project in 1989. Marcie continued to be engaged in research that involved in-patient care and cardiac rehabilitation when she took on the site lead role for the development of the *"MacNew Heart Disease"* health related quality of life instrument. While always interested in the area of electrophysiology, she developed expertise in atrial fibrillation and has served as a key clinical co-investigator for multiple atrial fibrillation research projects.

Marcie has been a member of Canadian Council of Cardiovascular Nurses (CCCN) for over 20 years and is deeply dedicated to their vision. She has held her CCN(C) certification since 2004. She has supported the CCCN as an abstract reviewer, moderator and member of the local planning committee. Marcie has provided extensive formal and informal mentoring, not only to nursing but the entire cardiovascular multidisciplinary team. Marcie continues to raise the profile of CCCN across the country. Her contributions to CCCN, both as a Research Scientist and a Nurse Practioner who leads by example, can only serve to inspire and ignite passion in our profession.

Christina Kuttnig RN, BN, CCN(C)

Mae Gallant Leadership Excellence Award in Cardiovascular Nursing

Chris Kuttnig is a leader in the area of education. She holds a continuing education instructor position in the Acute Cardiac Care Unit (ACCU), and through this formal leadership position, she guides and fosters the development of cardiology and cardiac critical care nurses. She provides ongoing education and mentorship to nurses to teach them, challenge them, spark their interest, and to ensure the highest level of care is provided to patients.

Chris works every day to advance cardiovascular nursing through leadership, advocacy, research, and knowledge translation. She is an exemplary cardiovascular nurse and a role model whose leadership benefits those around her and the general public.

Chris's leadership was a huge reason for the success of the CCCN National conference in Winnipeg in 2019. Chris ensured there was a mix of research and clinical presentations and posters and worked collaboratively with the planning committee to ensure an agenda that had something for everyone.

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