

Original Article

A 2020 Environmental Scan of Heart Failure Clinics in Ontario

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ABSTRACT

Background: Multidisciplinary heart failure (HF) clinics decrease hospital admission rates and healthcare use, while improving patient outcomes. To understand the contemporary availability of HF clinics in Ontario, Canada, and the services provided, we performed an environmental scan of physician-led and nurse practitioner (NP)-led HF clinics.

Methods: Between November, 2019 and February 2020, we identified Ontario HF clinics led by physicians or NPs. Following an invitation, we conducted a semi-structured interview to evaluate the services offered and qualitatively compared our findings to the results of the 2010 Ontario provincial survey.

Results: The number of HF clinics (36 vs 34 in 2010) and physicians (157 vs 143 in 2010) have not changed since the 2010 survey. Of the 36 clinics we identified, 30 participated in our interview (22 physician-led and 8 NP-led). Twenty-five clinics (83%) were hospital-based, of which 9 (30%) were part of an academic institution. Comparisons of

RÉSUMÉ

Contexte : Les cliniques multidisciplinaires d'insuffisance cardiaque (IC) diminuent les taux d'hospitalisations et l'utilisation des soins de santé, tout en améliorant les résultats pour les patients. Pour connaître l'offre actuelle de cliniques d'IC en Ontario, au Canada, et les services qui y sont dispensés, nous avons effectué une analyse contextuelle des cliniques d'IC dirigées par des médecins ou par des infirmières praticiennes.

Méthodologie : Entre novembre 2019 et février 2020, nous avons recensé des cliniques d'IC dirigées par des médecins ou des infirmières praticiennes en Ontario. Après avoir fait parvenir une invitation à ces professionnels de la santé, nous avons mené des entrevues semi-structurées afin d'évaluer les services offerts et avons, de façon qualitative, comparé nos résultats à ceux de l'enquête provinciale menée en 2010 en Ontario.

Résultats : Le nombre de cliniques d'IC (36 contre 34 en 2010) et de médecins (157 contre 143 en 2010) n'a pas changé depuis l'enquête de 2010. Parmi les 36 cliniques recensées, 30 ont participé à nos

Heart failure (HF) continues to be a primary cause of cardiovascular morbidity, mortality, and healthcare utilization in Canada. It is one of the top 5 causes for hospitalization and 30-day readmission.¹ Currently, more than 1 million Canadians are living with HF.² Within Ontario, over 250,000 patients were reported to have a diagnosis of HF in 2015,¹ with varying prevalence across the province.³

As the population ages and more individuals develop and live with cardiovascular disease, the economic burden placed on our healthcare system is bound to grow.⁴ In order to ease this burden,

specialized HF disease management clinics have been developed to improve patient care, optimize their health outcomes, and minimize the number of hospital readmissions. Indeed, studies have shown that these physician- or nurse-led clinics with a focus on educating, empowering, and supporting patients with careful clinical follow-up are associated with decreased patient hospital readmission rates and healthcare use, and in turn, improved patient quality of life (QoL) and decreased mortality.^{5–8} Given the heterogeneity in the makeup of these clinics and the disparities in HF care provided, Wijeyesundera et al. performed an environmental scan in 2010 to determine the availability of specialized HF clinics in Ontario and the scope of services offered.⁹ In their survey, restricted to physician-led models, they identified 34 clinics, observing variation in their structure and services offered.

Over the past 10 years, although Ontario's healthcare system has undergone significant restructuring, there remains a lack of standardization in funding policies for specialized clinics and funding allocation strategies according to local needs.¹⁰ Whether these changes have had an effect on the availability of these specialized HF clinics and the services offered is unknown. Therefore, we conducted an updated scan of HF clinics in Ontario

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Ethics Statement: This study was approved by the institutional research ethics board at the University Health Network. The participating physicians and nurse practitioners provided informed consent.

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See page 935 for disclosure information.

our findings to the 2010 study on 30 clinics show an approximately 3-fold increase ($P < 0.001$) in both median annual and new patient visits. As previously reported, the clinics varied in services offered, but trended toward an increased availability of onsite echocardiography, exercise-stress testing, and nuclear cardiology.

Conclusions: Compared to the survey performed a decade ago, the number of HF clinics and physicians have not changed, and the services provided remain heterogeneous. However, the increased number of patients served suggests a greater demand for these clinics. Improving the accessibility of these clinics and standardizing the service model are critical to improving patient outcomes.

led by either physicians or nurse practitioners (NPs), to describe the number of clinics, the attributes of healthcare providers, and the services offered, and compare these with results of the survey performed in 2010.

Methods

Institutional ethics approval

This study was approved by the institutional research ethics board at the University Health Network. The participating physicians and NPs provided informed consent.

Identifying Ontario HF clinics

We identified Ontario HF clinics led by physicians or NPs between November 2019 and February 2020. As was done previously,⁹ specialized HF clinics were defined as those led by a physician with formal training in HF (eg, through a fellowship) or as self-identified clinics with a physician or NP who follow HF patients. We identified clinics using 4 approaches: (i) those identified in the 2010 provincial scan;⁹ (ii) those listed on CorHealth Ontario's website; (iii) those identified through Google searches; and (iv) those disclosed to us via snowball-sampling—a qualitative research technique often utilized to identify “hidden populations” of participants.⁹

Semi-structured interview and analysis

Following an invitation to the lead physician or NP, we conducted a semi-structured interview to evaluate clinic characteristics and the services offered to patients. [Supplemental Appendix S1](#) lists the names of the participating clinics, and [Supplemental Table S1](#) contains the main elements enclosed in the survey. The design of the survey was informed by the quality indicators as described by the Government of Ontario¹¹ and based on quality statements outlined by CorHealth Ontario.¹ [Supplemental Table S2](#) describes these quality indicators and statements and how the information was collected in the survey. All the lead NPs at NP-led clinics participated in the interview; from the physician-led clinics, either the lead physician or the attending nurse participated.

Summary of results and statistical analysis

We summarized our results using descriptive statistics and compared them to the results of the 2010 Ontario provincial scan ([Table 1](#)) using a χ^2 test for proportions and a Student t test for continuous data.

entrevues (22 dirigées par des médecins et huit dirigées par des infirmières praticiennes). Vingt-cinq (83 %) des cliniques étaient situées en milieu hospitalier, dont neuf (30 %) qui faisaient partie d'un établissement d'enseignement. Les comparaisons de nos résultats à ceux de l'étude de 2010 sur 30 cliniques montrent que le nombre annuel médian de visites et le nombre de visites par de nouveaux patients ont tous deux triplé ($p < 0,001$). Comme il a déjà été mentionné, les services offerts étaient différents d'une clinique à l'autre, mais la tendance allait vers une augmentation des services d'échocardiographie, d'épreuves à l'effort et de cardiologie nucléaire offerts sur place.

Conclusions : Par rapport aux résultats de l'enquête réalisée il y a 10 ans, le nombre de cliniques d'IC et de médecins n'a pas changé, et les services fournis demeurent hétérogènes. Toutefois, la hausse du nombre de patients desservis semble indiquer une hausse de la demande pour ces cliniques. Une meilleure accessibilité à ces cliniques et une uniformisation du modèle de services sont essentielles à l'amélioration des résultats pour les patients.

Results

HF clinics and distribution

We identified a total of 36 HF clinics (31 clinics using the primary sources and 5 clinics via snowball sampling), of which 27 have a physician and 9 have an NP primarily attending. Fourteen clinics are in the Greater Toronto Area, 9 are in Central Ontario, 10 are in Eastern Ontario, 2 are in Northeastern Ontario, and 1 is in Northwestern Ontario. The distribution of these clinics within the regions of Ontario is presented as a heat map in [Figure 1](#). Five clinics from the 2010 scan had closed during the interim, with 2 merging under single leadership. We identified 13 new clinics (8 physician-led and 5 NP-led). Of the 36 clinics identified, 30 (83%) agreed to participate in the semi-structured interview, and 6 (17%) declined to participate.

Clinic characteristics

Of the 30 clinics participating in this study, 22 were physician-led and 8 were NP-led. Twenty-five clinics (83%) were hospital-based, of which 9 (30%) were part of an academic institution. Twenty-seven (90%) clinics were staffed with a cardiologist, and of these, 20 (67%) had at least one cardiologist who had completed formal HF fellowship training. There were a total of 157 physicians and 60 full-time equivalent nurses and NPs working at the 30 clinics.

The median estimated annual patient visit-volume in the past year was 2000 (interquartile range [IQR] 1163-3000) with 200 (IQR 105-363) new patient annual visits. The median ratio of annual visits in relation to new patients was 7 (IQR 5-15), with smaller clinics showing the smallest relative number of annual new patient visits compared to total patient visits.

Clinic services

Services provided differed by HF clinics ([Fig. 2](#)). Onsite echocardiography service was available in 29 (97%) clinics, exercise stress-testing in 28 (93%), nuclear cardiology in 24 (80%), and angiography in 15 (50%). Additionally, 13 (43%) clinics had an implantable cardioverter defibrillator (ICD)/cardiac resynchronization therapy (CRT) clinic available onsite, and 3 (10%) clinics had a heart transplant or mechanical support

Table 1. Comparison of characteristics of identified clinics in 2010 vs 2020

Parameters	2010	2020	P
Personnel			
Number of clinics identified	34 (all physician-led)	36* (27 physician-led and 9 NP-led)	
Number of clinics interviewed	30	30 (22 physician-led and 8 NP-led)	
Clinics with internists	22.6	27	0.696
Clinics with family physicians	9.7	1	0.138
Academic	25.8	30	0.719
Hospital-based	80.6	83	0.811
Clinic characteristics			
Median (IQR) annual total visits	675 (200-1479)	2000 (1163-3000)	< 0.001
Median (IQR) annual total new patients	78 (25-128)	200 (105-363)	< 0.001
Availability to onsite echocardiography	80.6	97	0.046
Availability to onsite exercise stress testing	77.4	93	0.092
Availability to onsite nuclear cardiology testing	58.1	80	0.069
Availability to onsite angiography	38.7	50	0.382
Availability to onsite device therapy	n.r.	43	
Availability to onsite advanced heart failure therapy	n.r.	10	
Providing advanced care and end-of-life planning	n.r.	83	
Providing telemedicine monitoring	n.r.	50	
Providing telephone follow-up calls	50	67	0.185
Healthcare support			
Availability to dietician (in-clinic)	45.2	30	0.228
Availability to pharmacist (in-clinic)	32.3	27	0.656
Availability to physiotherapy (in-clinic)	6.5	7	0.939
Availability to counsellor (social worker; in-clinic)	16.1	7	0.274
Affiliated with cardiac rehabilitation	87.1	83	0.659
Involved with other chronic disease management	64.5	67	0.840

Values are %, unless otherwise indicated.

IQR, interquartile range; NP, nurse practitioner; n.r., not reported.

*Of the 29 listed heart failure clinics from the 2010 publication, we noted that 5 had closed and 2 had merged, resulting in 23 available clinics. With the addition of the 13 new clinics we identified, there are currently 36 clinics available.

(ventricular assist device) clinic available onsite. All clinics reported providing a welcoming of phone calls from patients to discuss any health concerns, with 15 (50%) clinics providing remote monitoring via telemedicine, and 20 (67%) providing routine follow-ups via telephone calls. In addition, home visits, whether mediated through clinic staff or a community partner, were provided by 12 (40%) clinics. In-clinic availability of allied health professionals was limited, with 9 (30%) of the clinics having access to dietitians, 8 (27%) to pharmacists, 2 (7%) to physiotherapists, and 2 (7%) to counsellors (social workers). As well, 25 (83%) clinics reported discussing advanced care and end-of-life planning, with 17 (57%) clinics able to provide on-site consultation with palliative care consultants. Twenty-five (83%) clinics were affiliated with cardiac-rehabilitation programs, and 20 (67%) were involved with other chronic disease-management programs, such as diabetes, pulmonary disease, infectious disease, cancer, cardio-oncology, vascular disease, endocrinology, or general internal medicine rapid-assessment clinics.

The types of patients served at the clinics varied, with 9 (30%) clinics filtering referrals based on disease severity (eg, serving only those who had had 2 HF emergency department (ED) visits in the past year, or with a left ventricular ejection fraction <30%). The majority of clinics did not impose any restrictions in accepting referrals; however, 4 (13%) clinics accepted referrals only from specialists, of which 3 (10%) accepted referrals only from cardiologists at their institutions.

All clinics reported educating patients on signs and symptoms of HF, medication adherence, healthy diet, and exercise; however, only 19 (63%) clinics counselled all patients on self-titration of diuretics, with 11 (37%) selectively educating only those

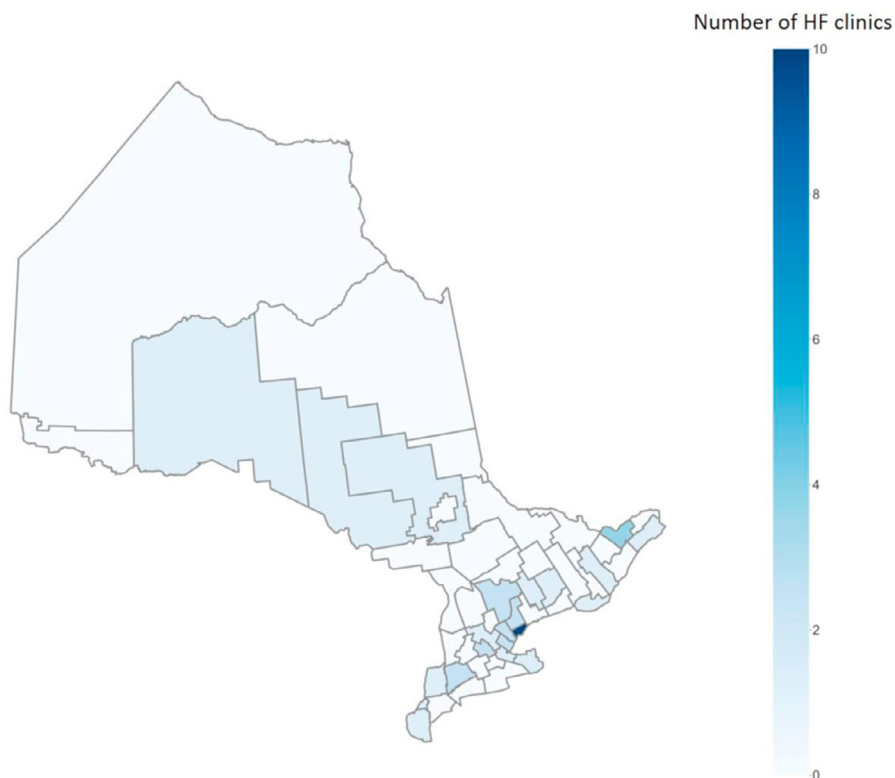
patients whom they felt would be able to self-titrate. The weights of patients were also reportedly measured routinely at every visit by 26 (87%) clinics. Education was tailored according to the patient's needs and level of understanding, and reinforcement was provided at subsequent visits. Twenty-eight (93%) clinics supplemented the in-clinic education with pamphlets/booklets, 13 (43%) referred patients to web-based resources, and 3 (10%) reported conducting separate group educational sessions. As well, all clinics (100%) indicated that caregivers accompanying patients are also provided with the same education.

All clinics reported that medication optimization was individualized based on patient tolerability of any side effects experienced. An appointment frequency of every 1-2 weeks for medication optimization was reported by 14 (47%) clinics, and every 2-4 weeks by 9 (30%) clinics. One (3%) clinic reported an appointment frequency of every 1-2 months, and 6 (20%) reported variable frequency.

One clinic (3%) stated that prognosis discussion occurred at every clinic visit, whereas the others stated that prognosis was only discussed during specific events, such as after a visit to the ED, hospital admission, defibrillator discharge, or change in markers or symptoms.

Discussion

The purpose of this survey was to determine whether the number of HF clinics in Ontario, as well as the services offered, have changed since the original scan in 2010.⁹ We report that the number of clinics and physicians have not changed substantially (have increased by ~6% and 8%, respectively); however, the number of patients served by



Region	# of clinics	Population ≥ 2 years of age	Population ≥ 20 years of age per HF clinic
GTA (Toronto, Halton, Peel, and York)	14	5,463,191	390,228
Central (Hamilton, Niagara, Peterborough, Simcoe, Kawartha Lakes, Waterloo, and Wellington)	9	2,484,509	276,057
East (Ottawa, Frontenac, Prince Edward, and Stormont, Dundas, & Glengarry)	6	1,503,993	250,667
Southwest (Essex, Lambton, and Middlesex)	4	1,330,633	332,658
Northeast (Algoma and Sudbury)	2	454,445	227,223
Northwest (Thunder Bay)	1	188,083	188,083

Figure 1. Heat map of heart failure (HF) clinic distribution in Ontario, based on the map of Ontario census divisions;²⁵ the regional total adult population (≥ 20 years of age), based on 2019 census data;²⁶ and the calculated population served per HF clinic in the respective regions. GTA, greater Toronto area.

contemporary clinics and diagnostic tests provided by these clinics have increased significantly over time.

Although 5 of the originally identified physician-led clinics have closed, and 2 have merged, in the interim, 8 new ones

have been identified. Compared to the previous survey, there has been a significant increase in the total number of annual patient visits and annual new patient visits. This increase is likely a reflection of the increase in the aging population¹² and those

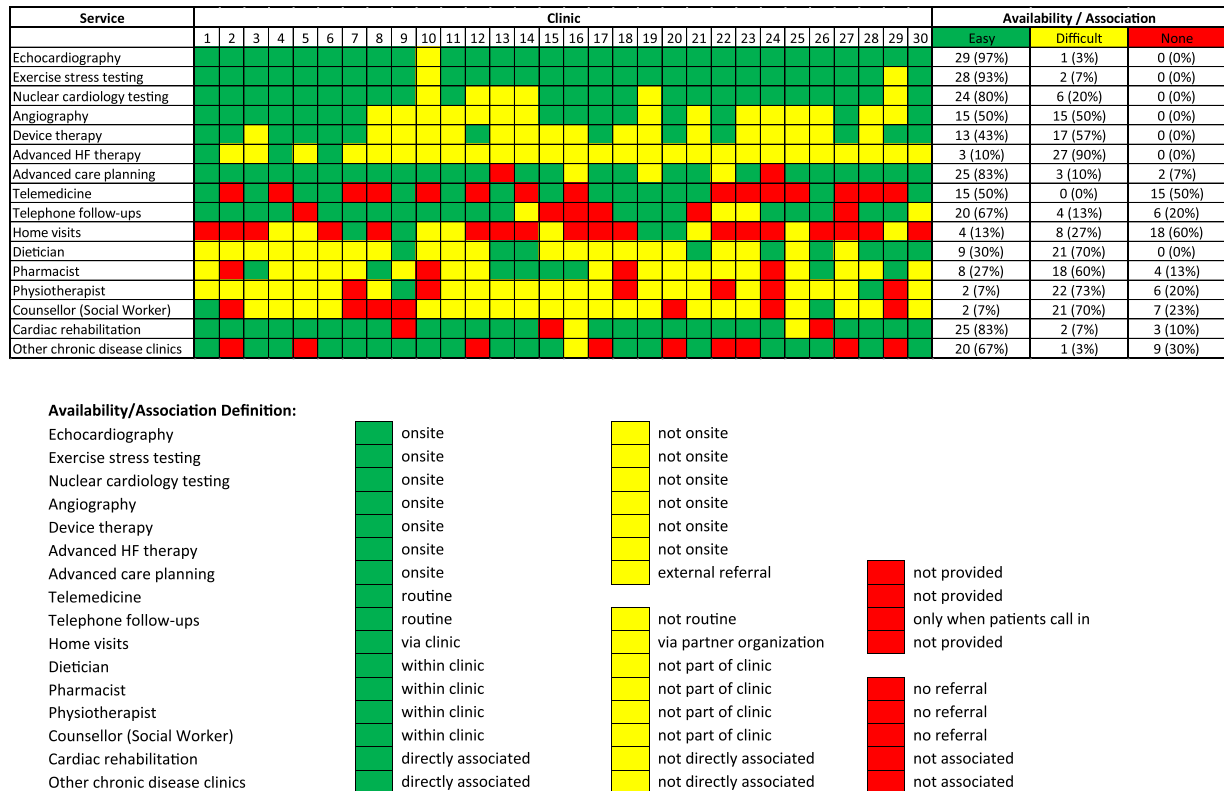


Figure 2. Services provided by heart failure (HF) clinics.

living with HF.¹³ Tu et al. previously showed that general practitioners/family physicians, rather than cardiologists, were the physicians primarily responsible for managing ~50% of the patients discharged from the hospital after being admitted with HF.¹⁴ Given that there are ~250,000 HF patients in Ontario, and that an estimated number of 20,000 patients may be followed annually by the 30 clinics surveyed, it is clear that the number of available clinics and their capacity need to increase to close this gap. Indeed, in evaluating the effectiveness of multidisciplinary HF clinics in Ontario, Wijesundera et al. reported that only ~10% of patients with a HF hospitalization were seen at a specialized HF clinic within a year of discharge.⁷ Moreover, based on the available evidence, it appears that only a small minority (approximately 15%) of patients with HF are being referred to a HF clinic, after a hospitalization.¹⁵ Thus, by understanding the referral practices of primary care physicians and providing them with the tools and support needed to identify high-risk patients for HF clinic referral, this care gap may be further narrowed. One such tool is CorHealth Ontario’s Integrating Heart Failure Care Implementation Support Toolkit, designed to foster a collaborative partnership among primary care physicians, specialists, and allied health professionals. By championing efforts to integrate various resources and stakeholders, a more efficient system with standardized processes can be implemented to ensure that patients most in need of specialized HF care not only have access to these clinics, but also are able to benefit from comprehensive management of their disease. Although the 2010 survey reported considerable ranges in the intensity of the education program provided to patients, with some focusing on treatment adherence only and others

including surveillance, management, and evaluation of symptoms, we observed that all clinics in our survey emphasized the importance of educating not only patients, but also their caregivers, on all these aspects of care. Timely detection of volume overload through weight gain is crucial in preventing HF disease progression and rehospitalizations. Although all clinics provided education on the importance of weight monitoring, 87% reported measuring patient weight at each clinic visit. Similarly, education on self-managing diuretic titration was not uniformly provided across clinics. Although most clinics provided education to all patients on how to self-titrate diuretics, a third stated that they individualized the education to include only those who they felt would be able to self-titrate. Uncertainty exists as to whether patient diuretic self-titration could be beneficial. A randomized controlled trial¹⁶ examining the effects of a diuretic titration protocol in patients with stable HF reported a significant improvement in exercise tolerance and health-related QoL, as well as that patients experienced fewer HF-related ED visits at 3 months compared to those receiving usual care. However, the number of patients who had a level of education less than grade 12 was disproportionately higher in the group receiving usual care. Thus, further research is warranted to determine the benefits of self-managing diuretic titration in a more diverse group of patients with varying severities of HF.

In 2010, it was noted that remote monitoring and a home-based component were absent in the majority of clinics surveyed, and that half the clinics contacted patients via telephone between in-person evaluations. Currently, there appears to be an increase in these services. Various remote-monitoring platforms have been utilized in the proactive management of HF

patients, aiming to improve patient symptoms and QoL, and to help reduce the economic burden of HF on the healthcare system.¹⁷ Ware et al. have demonstrated that telemonitoring, implemented as the standard-of-care, reduced HF and all-cause hospitalization while improving patients' HF-related QoL and self-care management abilities.¹⁸ Furthermore, recent systemic reviews have reported that similar home telemonitoring interventions in HF patients reduced mortality, HF hospitalization, and all-cause hospitalization, while improving QoL.^{19,20} Given that the survey was conducted prior to the coronavirus disease 2019 pandemic, and that there has since been a spike in telehealth use,²¹ it remains to be determined whether telehealth technologies will be a more uniform mainstay in the practice patterns of these HF clinics, allowing these clinics to become more accessible to those in rural areas.

A recent national Canadian survey²² of 45 selected HF clinics (13 from Ontario) demonstrated, similar to our findings, that the majority of clinics provided educational resources, telephone nursing support, and access to cardiac rehabilitation services, followed guideline-directed medication optimization, and counselled on medication adherence, diet, and advanced care planning. Similar to our provincial survey, the criteria for referral acceptance were significantly heterogeneous at the national level, an issue leading to inequality in patient care, difficulty in access, and potentially poorer patient outcomes and experience. The reported national annual average visit volume was 25% higher than that at the provincial level (~2500 visits in comparison to 2000 at the provincial level). This difference may be related to the higher representation of non-academic and non-hospital-based smaller clinics (~20%) at the provincial level. These observations were also summarized by Abrahamyan et al.²³ in their narrative review of accessibility and referral practices to HF clinics in Canada, highlighting the lack of standardization governing HF healthcare policies across Canadian provinces. They too underscored the need for specific patient-referral criteria in order to unify practice patterns and holistically inform future planning to ensure the optimal distribution, number, and structure of HF clinics. However, these concerns are not uniquely Canadian, as discussed in the realist review by Fowokan et al.²⁴ In their comprehensive review of 29 studies from 5 countries, the authors noted that, regardless of the significant differences in healthcare infrastructures, the lack of clear, consensus guidelines on referral criteria was an underlying theme impacting appropriate HF clinic accessibility in various countries.

Given the large population of ethnically diverse individuals in Ontario, it would be imperative for physicians and NPs to develop a more patient-centred practice model to help patients overcome any perceived cultural or language barriers. However, we had not assessed the availability of culturally diverse staff or those able to support special populations (for example, indigenous communities), the ability for patients to access services offered in other languages, or the use of culturally sensitive educational tools. By ensuring that local hospitals and clinics are staffed with individuals whose cultural backgrounds reflect those of the patients, by providing educational material in relevant languages, creating a position for a community-based HF educator, and organizing patient support groups, these cultural or language barriers may be removed, thereby improving patient access to quality care.

The "Connecting Care to Home" program (currently available only in the Southwest Local Health Integration Network) allows for a multidisciplinary healthcare approach to be taken to

integrate patient care between the hospital and the home. Through this program, patients are supported by a 24-hour helpline and a dedicated home care team, providing patients with the knowledge and tools to self-manage. Expanding the availability of a similar program across Ontario may provide patients—especially those with socioeconomic barriers, who face challenges in accessing HF clinics, or those living in areas where telemonitoring is not viable—with the opportunity to remain connected with their caregivers and improve their outcomes. Services to underrepresented populations may also be improved by leveraging other healthcare workers, such as dietitians/paramedics, who may be able to provide more routine follow-up care for patients at their homes. In addition, by partnering with local pharmacies and equipping them with computers or laptops for telemonitoring, patients may be able to access HF physicians or NPs in a timelier manner. Certainly, a thorough appraisal of these potential opportunities to create equitable access needs to be evaluated to develop a high-quality healthcare system.

Study Limitations and Future Research

In this study, we collected qualitative information on whether a clinic is able to provide a certain service. We did not assess the extent to which the services are offered and did not collect individual patient data to qualitatively determine if an adequate number of patients are being offered the services. Unlike the previous provincial environmental scan, we did not utilize the HF Disease Management Scoring Instrument and concept-mapping technique to rank clinics according to the intensity and complexity of their service models; rather, we chose to report on the primary data. Although our study was designed only to identify currently available HF clinics in Ontario and broadly evaluate their service components, it would be of interest to investigate whether rehospitalization and mortality rates varied, based on the scope of services provided by the clinics. As well, our study highlights opportunities for future research, including, but not limited to, assessing the benefits of integrated HF care, patient-managed diuretic titration, and accessible telemonitoring. With this knowledge, perhaps a more effective healthcare delivery model may be designed to improve health outcomes.

Conclusions

There has been an increased demand reflected by increasing visit-volume in HF clinics in Ontario, despite the stable number of clinics and attending staff. A lack of uniformity in several service components, as highlighted in the Ontario survey 10 years ago, continues to be a topic of concern as presented in the recent pan-Canadian survey, and as mirrored in our contemporary provincial survey. By engaging policymakers so that more dedicated funding may be designated for improving HF clinic accessibility and developing a more standardized service model, the burden of HF on the healthcare system can be minimized, while improving patient outcomes.

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Disclosures

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Supplementary Material

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