Heart Failure Care in Rural Canada: Nurse Practitioners Addressing the Disparity

Aldy L. Kusno and Dr. Elsie Duff
Faculty of Nursing
University of Manitoba

Highlights:

- The high annual healthcare system costs and mortality associated with heart failure (HF) is a growing problem.
- Rural populations have higher rates and costs of cardiovascular disease, yet few heart failure services are available.
- The management of heart failure differs between Canadian provinces, with urban areas having better access to services.
- Access to NPs in heart failure clinics can increase patients' adherence to care plans, lower hospital readmission rates, decrease follow up appointment times thus lowering health system costs, and reduce mortality.
- NPs are a cost effective solution to the shortage of HF clinics in rural communities.

ABSTRACT

Heart failure (HF) is a chronic disease that requires regular, frequent healthcare visits and is one of the leading causes of hospitalization. Patients with HF have reduced physical function that affects multiple aspects of their lives, including mood, exercise, and activities of daily living. Patients recently diagnosed with HF require significant lifestyle changes to maintain their health and function. More importantly, these patients require appropriate access to care to increase their adherence to lifestyle changes and decrease their risk of mortality. Nurse practitioners (NPs) are well situated to address inequities in the care of HF patients and meet the needs of rural populations who have reduced access to health services.

KEYWORDS: Urban population, rural population, Canada, patient compliance, heart failure, chronic disease, nurse practitioner, health equity

Heart failure (HF) is a leading cause of hospital admission and readmission that in turn increases costs the Canadian healthcare system (Poon et al, 2022).[1] There are significant disparities in the delivery of cardiac care between Canadian jurisdictions, with cardiac clinics primarily condensed in urban areas and few services available to rural populations. These disparities impede timely access to care and increase costs for patients who must travel to appointments. Inadequate access to care also contributes to higher HF mortality rates, as evidenced by the outcomes in rural populations (Muñoz et al., 2020).[2] Studies have found that readmission rates among patients with HF are as high as 20% within 30 days of hospital discharge, and that timely post-hospitalization appointments can improve management of the disease and decrease rates of readmission (Gandhi et al., 2017; Virani et al., 2017).[3,4] Patients who live in rural areas are at higher risk of developing complications of HF because they have fewer clinical appointments, undergo less screening, and are more likely to be underdiagnosed when compared to their urban counterparts (Primm et al., 2019).[5] Rural disparities negatively impact HF outcomes by decreasing patients' adherence to care plans, reducing the likelihood that patients will attend follow up appointments, and impeding patients' access to health assessment and monitoring. Nurse practitioners (NPs) are ideally situated to ensure timely follow-up of patients with HF while also minimizing rehospitalization and mortality rates among rural and urban populations.

Implications of Nurse Practitioner Care for Heart Failure Patients

Canadian NPs are registered nurses who have completed a graduate level of education and hold the legal authority to diagnose and treat illness, order diagnostic tests, and prescribe medications or perform procedures (CNA, 2021).[6] NPs often work in specialized areas of clinical care, for example, cardiac clinics. As such, NPs are important members of the interprofessional network of providers within HF care, where they monitor HF symptoms, provide patient education, and titrate medications as appopriate (Waters & Giblin, 2019).[7] Patients with HF are instructed to follow up with their healthcare provider within 7 to 14 days of hospital discharge (Waters & Giblin, 2019).[7] NPs are able to conduct holistic patient assessments during these transitions of care, thus reducing rates of rehospitalization and mortality (Waters & Giblin, 2019).[7] As a result, Canadian NPs serve as a cost-effective resource within rural HF care settings (Craswell et al., 2018).[8]

Heart Failure Epidemiology

Patients with HF have a 20 to 25% rate of readmission within the first 30 days post-hospitalization (Gandhi et al., 2017; Virani et al., 2017).[3, 4] In addition, mortality rates among these patients are as high as 30% within one year of hospitalization (Gandhi et al., 2017; Virani et al., 2017).[3, 4] HF is the third leading reason for hospital stays in Canada with an average length of stay being 7 days (CIHI, 2023).[9] It is critical to enhance the outpatient management of HF within Canada in order to address the simultaneous increases in healthcare spending, rates of HF-related complications, and complexity of overall care. In addition, inconsistencies in the care of patients with HF need to be addressed across Canada; only a few provinces have dedicated HF programs, while others solely rely on primary care providers (Virani et al., 2017).[4]

There are several disparities between rural and urban populations in terms of HF care, including travel time and available services (see Table 1). Rural populations tend to have poorer access to high quality HF care, are more likely to face shortages of healthcare providers, and have higher rates of cardiovascular disease when compared to urban populations (Primm et al., 2019).[5] For example, rural patients with New York Heart Association (NYHA) class IV HF, which is defined as a patient who experiences HF symptoms at rest and is unable to perform any physical activity without discomfort, have 35% higher mortality rates when compared to their urban counterparts (Muñoz et al., 2020; American Heart Association, 2021).[2, 10] In urban areas, patients with lower socioeconomic status often become dependent on urban emergency care services for their primary HF care. As a result, their service utilization rates are three times higher than their rural counterparts (Muñoz et al., 2020).[2] However, rural counterparts have more delays in accessing services as there are varying amounts of out-of-hours service centres depending on location, and their primary care providers are not as available throughout the week (Muñoz et al., 2020).[2]

Table 1: Disparities between Rural and Urban Populations with Heart Failure *(Muñoz et al., 2020)*[2]

• Increased travel time
• Less available health services for heart failure
• Less health service utilization
• Less primary care providers
• Higher mortality

Burden of Hospital Readmission and 1 Month Rates

High re-hospitalization rates among HF patients (Gandhi et al., 2017)[3] affect healthcare costs, patient mortality, and overall quality of life (Gandhi et al., 2017).[3] These rates most often reflect the re-admissions that occur in the first 28 to 30 days post-discharge. Re-hospitalization rates have not improved since 2007 and continue to grow with the ageing Canadian population (Virani et al., 2017).[4] In addition, patients with HF tend to have longer stays in hospital, which increases healthcare costs and resource utilization and decreases patient quality of life (Virani et al., 2017).[4] A key strategy to effectively reduce re-hospitalization rates and mortality is to provide patients with adequate access to HF clinics.

Heart Failure Clinics

Specialized HF clinics are multidisciplinary settings staffed by nurses, cardiologists, pharmacists, psychologists, dieticians, and social workers who often have specific training or expertise in HF care (Gandhi et al., 2017).[3] These clinics focus on patients' lifestyle, diet, exercise, medication compliance, and education about medication titration (Gandhi et al., 2017).[3] There is significant variation in the way these HF care centres are integrated into the healthcare system across Canada. This is likely due to differences in the services offered at each clinic, and the demand for care of other cardiac diseases that benefit the publicly funded healthcare system in Canada. While a few Canadian provinces have developed specialized HF programs, others rely exclusively on primary care to manage HF (Virani et al., 2017).[4] Jurisdictional comparisons of cardiac clinics demonstrate that HF programs differ in terms of the services they provide and the populations they serve. In addition, these clinics are often defined in different ways, and may be called "heart clinics", "cardiac centres", "heart centres", "cardiac care clinics", "cardiac rehabilitation centres", and "heart failure clinics".

Benefit of Heart Failure Clinics

Research has shown that HF clinics can improve patient re-hospitalization rates and decrease patient mortality (Ghandi et al., 2017; Koser et al., 2018; O'Toole et al., 2020).[3, 11, 12] Although HF clinics show promise in reducing hospitalization and mortality rates among all HF patients, the most significant benefits have been observed among those with HF decompensation who require emergency room treatment or hospital admission (Ghandi et al., 2017).[3] The care provided at HF clinics is targeted, patient-centred, and individualized, without the limitations of time and resources that are common in primary care clinics. HF clinics have the capacity to enhance health equity by focusing on the holistic management of HF, and offering additional follow up appointments within local health systems (Gandhi et al., 2017).[3] These clinics, especially when NP-led and multidisciplinary, promote patient self-care and have the potential to lower post-clinic hospitalizations (Charteris & Pounds, 2020).[13] As a result, NPs play a pivotal role in the multidisciplinary team at HF clinics, where they can address the needs of HF patients across Canada.

Benefits of Nurse Practitioners in HF Care

The collaborative and comprehensive patient-centred approach utilized by NPs can increase patient adherence

to care plans, enhance patient engagement, and improve clinic appointment attendance in cardiac rehab settings (O'Toole et al., 2020) (Table 2).[12] Charteris and Pounds reported that care plan engagement and adherence were increased among patients who attended an NP-led cardiac rehabilitation program between 2014 to 2016.[13] This is an important finding because medication and diet non-adherence are key care plan factors that contribute to decompensation and rehospitalization among patients with HF (Charteris & Pounds, 2020).[13]

NPs working in multidisciplinary HF clinics can significantly impact patient outcomes (see Table 2). For example, 30-day hospital re-admission rates decreased by 8% and all-cause mortality rates were 0% among patients who attended an NP-led multidisciplinary HF clinic (Siodlak et al., 2020).[14] In a smaller study, 30-day re-admission rates were lower than average in a multidisciplinary clinic that included NPs (Charteris & Pounds, 2020).[13] As well, there was a significant decrease in the length of time between hospital discharge and follow up appointments (from 45 to 19 days), and a high degree of patient satisfaction (93% positive). (Charteris & Pounds, 2020).[13]

Table 2: Key Benefits of Nurse Practitioners in HF Care *(O'Toole et al., 2020)*[12]

• Comprehensive patient-centred model of care focused on health promotion and disease prevention.
• Increased patient care plan engagement and prolonged care plan adherence.
• Decreased 30-day re-hospitalization rates.
• Decreased number of days between discharge and follow up.
• Evidence of increased benefits when paired with a multidisciplinary team.

Applications to Rural Communities

Rural settings present additional barriers to the accessibility of healthcare, due to geographical issues and limited availability of healthcare staff (CARRN, 2020).[15] NPs can be a viable alternative to provide consistent care in rural communities (Waters & Giblin, 2019).[7] Since NPs focus on health promotion and disease prevention, these practitioners are well positioned to address comorbidities in rural populations and reduce the effects of geographical barriers.

Although a multidisciplinary approach is optimal when managing HF, it can be challenging to maintain consistency of care if patients are forced to move between multiple settings and care providers (Virani et al., 2017; Waters & Giblin, 2019).[4, 7] Patients with HF require multiple follow-up appointments for medication titration, self-care education, and symptom management. As a result, rural communities would benefit from having either a clinic with a multidisciplinary team that includes an NP or a HF-specific clinic that is led by an NP to deliver high quality patient-centred HF care. NPs play a particularly important role in rural communities due to the higher rates of cardiovascular disease and mortality among these populations. In addition, this population of clients benefit from more frequent and thorough appointments for preventative care, which NPs are well suited to provide (Muñoz et al., 2020; Primm et al., 2019).[2, 5]

> "NPs play a critical role in addressing the burden of disease among HF patients within rural areas."

Implications for Health Systems

A multidisciplinary approach to HF care, including rehabilitation and follow-up, are important to address the rising hospital costs in Canada as well as the high rates of complications and mortality associated with the disease. Rural populations are at particularly high risk of HF complications and can reap significant benefits from NP-led multidisciplinary care teams. Health authorities and stakeholders can improve access to care and promote better health outcomes for HF patients by utilizing NPs within their respective rural healthcare hubs.

Conclusion

The management of HF within primary care is becoming increasingly more complex as the Canadian population continues to age. NPs play a critical role in addressing the burden of disease among HF patients within rural areas. Rural NP-led HF clinics can positively impact the care of HF patients by increasing their adherence to care plans, reducing hospital readmission rates, decreasing the time between initial assessment and follow up appointments, and lowering their rates of mortality (Charteris & Pounds, 2020).[13] As a result, NP-led clinics could also be associated with a significant reduction in overall healthcare costs. NPs serve as a viable solution to address the current lack of high-quality HF care in rural settings. NPs can meet the complex care needs of this patient population while simultaneously reducing costs to the system and contributing to positive patient outcomes.

1. Poon, S., Leis, B., Lambert, L., MacFarlane, K., Anderson, K., Blais, C., Demers, C., Ezekowitz, J. A., Hawkins, N. M., Lee, D. S., Moe, G., Sandhu, R. K., Virani, S. A., Wilton, S., Zieroth, S., & McKelvie, R. (2022). The State of Heart Failure Care in Canada: Minimal Improvement in Readmissions Over Time Despite an Increased Number of Evidence-Based Therapies. CJC Open, 4(8), 667–675. https://doi.org/10.1016/j.cjco.2022.04.011
2. Muñoz, M. A., Garcia, R., Navas, E., Duran, J., Del Val-Garcia, J. L., & Verdú-Rotellar, J. M. (2020). Relationship between the place of living and mortality in patients with advanced heart failure. BMC Family Practice, 21(145), 1–10. https://doi.org/10.1186/s12875-020-01213-x
3. Gandhi, S., Mosleh, W., Sharma, U. C., Demers, C., Farkouh, M. E., & Schwalm, J. D. (2017). Multidisciplinary Heart Failure Clinics Are Associated With Lower Heart Failure Hospitalization and Mortality: Systematic Review and Meta-analysis. Canadian Journal of Cardiology, 33(10), 1237–1244. https://doi.org/10.1016/j.cjca.2017.05.011

4. Virani, S. A., Bains, M., Code, J., Ducharme, A., Harkness, K., Howlett, J. G., Ross, H., Sussex, B., & Zieroth, S. (2017). The Need for Heart Failure Advocacy in Canada. Canadian Journal of Cardiology, 33(11), 1450–1454. https://doi.org/10.1016/j.cjca.2017.08.024
5. Primm, K., Ferdinand, A. O., Callaghan, T., Akinlotan, M. A., Towne, S. D., & Bolin, J. (2019). Congestive heart failure-related hospital deaths across the urban-rural continuum in the United States. Preventive Medicine Reports, 16(November), 101007. https://doi.org/10.1016/j.pmedr.2019.101007
6. CNA. (2021). Nurse Practitioners. Retrieved from https://cna-aiic.ca/en/nursing-practice/the-practice-of-nursing/advanced-nursing-practice/nurse-practitioners
7. Waters, S. B., & Giblin, E. M. (2019). Acute Heart Failure: Pearls for the First Posthospitalization Clinic Visit. Journal for Nurse Practitioners, 15(1), 80–86. https://doi.org/10.1016/j.nurpra.2018.08.031
8. Craswell, A., Dwyer, T., Rossi, D., Armstrong, C., & Akbar, D. (2018). Cost-effectiveness of Nurse Practitioner–Led Regional Titration Service for Heart Failure Patients. Journal for Nurse Practitioners, 14(2), 105–111. https://doi.org/10.1016/j.nurpra.2017.11.007
9. CIHI. (2023). Hospital Stays in Canada.CIHI. Retrieved from https://www.cihi.ca/en/hospital-stays-in-canada
10. American Heart Association. (2021). Classes of Heart Failure. Retrieved from https://www.heart.org/en/health-topics/heart-failure/what-is-heart-failure/classes-of-heart-failure
11. Koser, K. D., Ball, L. S., Homa, J. K., & Mehta, V. (2018). An Outpatient Heart Failure Clinic Reduces 30-Day Readmission and Mortality Rates for Discharged Patients: Process and Preliminary Outcomes. Journal of Nursing Research, 26(6), 393–398. https://doi.org/10.1097/jnr.0000000000000260
12. O'Toole, K., Chamberlain, D., & Giles, T. (2020). Exploration of a nurse practitioner-led phase two cardiac rehabilitation programme on attendance and compliance. Journal of Clinical Nursing, 29(5–6), 785–793. https://doi.org/10.1111/jocn.15133
13. Charteris, E. J., & Pounds, B. (2020). A nurse practitioner-led effort to reduce 30-day heart failure readmissions. Journal of the American Association of Nurse Practitioners, 32(11), 738–744. https://doi.org/10.1097/JXX.0000000000000470
14. Siodlak, M. M., Sgarlata, C., Chung, I. W., Kashyap, A., Murray, D. R., & Middleton, W. S. (2020). Integrated Nurse Practitioner and Pharmacist Post-discharge Heart Failure Clinic: Impact on Patient Outcomes. Journal of Cardiac Failure, 26(10), S106. https://doi.org/10.1016/j.cardfail.2020.09.306
15. CARRN. (2020). Rural and remote nursing practice parameters. Retrieved from http://www.carrn.com/files/NursingPracticeParametersJanuary08.pdf

    CASN. (2012). Nurse Practitioner Education in Canada: National Framework of Guiding Principles & Essential Components. Retrieved from https://casn.ca/wp-content/uploads/2014/12/FINALNPFrameworkEN20130131.pdf