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A Multiple-Case Study in Nurse Practitioner-Led Clinics: An Exploration of the Quality of Care for Patients with Multimorbidity

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Abstract
The previous 16 years have seen a number of healthcare reforms meant to increase access to primary healthcare services in Ontario. This included the establishment of an innovative model, the nurse practitioner-led clinics (NPLCs). NPLCs held promise for nurse practitioners (NPs) to practice to their full potential and optimize patient care. A multiple-case study was undertaken to evaluate the quality of care for patients with diabetes and multimorbidity at NPLCs.

Five NPLCs, all in underserved areas in the mid-northern region of the province, were part of the study. Data collection included a chart audit, NP interviews and review of organizational information. Multiple-case analysis was conducted and four inter-related themes emerged about the quality of care of patients with diabetes and multimorbidity at the NPLCs.

It was confirmed that the NP is the primary care provider at NPLCs. Healthcare policy such as a lack of increase in NP salary for 10 years has contributed to poor NP recruitment and retention. Insufficient healthcare resources in the communities where NPLCs are located and high patient vulnerability have a negative influence on the quality of care. Strategies, including mentoring, offer possible solutions to improve the quality of care at NPLCs.

Introduction

The new millennium brought a wave of primary care reform in Ontario (Sweetman and Buckley 2014), with the overarching objective of increasing access to comprehensive primary healthcare (PHC) (Health Quality Ontario 2015). One new model that arose from these reforms was the nurse practitioner-led clinic (NPLC). NPLCs are unique in that they mark the first time that funding for provider-led comprehensive PHC organizations was not based on physician remuneration. The NPLC model held the promise of innovation and allowing NPs to work in the full scope of practice (Virani 2012).

The NPLC model is different from other PHC organizations in that patients register to the NPLC and are assigned to a nurse practitioner (NP) rather than rostered to a physician. NPs consult and collaborate with an interprofessional team of healthcare providers, including a mix of physicians, registered nurses, registered practical nurses, social workers, dietitians and pharmacists (Virani 2012). In this model, physicians act more as "primary care consultants" and are funded to provide consultation for NPs on complex cases and, in a very limited context, to see these patients in the clinic setting (Virani 2012).

Along with the PHC reform, there is an expectation of organizational accountability (MOHLTC 2015). There has been extensive evaluation of PHC in Ontario, comparing various physician funding models and community health centres. Findings of these studies identify that community health centres offered significantly more comprehensive services and higher rates of health promotion than other models (Hogg et al. 2009; Russell et al. 2009). Another study showed that patients at community health centres were from the lower-income strata and had higher rates on social assistance and more severe mental illness and chronic diseases than physician-based models of PHC, but also had considerably lower rates of emergency department visits than expected (Campbell 2001; Glazier et al. 2012). Another comparison of physician-funded PHC models and community health centres demonstrated that overall the quality of diabetes care was higher in community health centres, while smoking cessation strategies and measuring waist circumference were higher in a blended capitation model, and fee-for-service practices had the greatest gaps in care (Liddy et al. 2011).

The NPLC model has not been part of evaluative research studies like other, well-established PHC models. There are a number of national and international studies that evaluate and confirm the positive impact of NP practice. However, the studies focus on specific care settings or conditions, such as in emergency room (Jennings et al. 2008) or in NP-led chronic disease management clinics (Watts et al. 2009), rather than models of care led by NPs. There is a gap in what is known about comprehensive PHC models led by NPs, specifically the NPLCs, positioned within the Ontario health system context.

The purpose of this multiple-case study was to evaluate the quality of care for patients with diabetes mellitus and multimorbidity in five NPLCs. Diabetes was chosen as a key element because it is one of the most complex conditions that is managed at the family practice level. The addition of patients with multiple chronic conditions allowed for a better understanding of the extent to which processes in the NPLC model supported care within best practice parameters in complex clinical situations.

Donabedian Quality Framework

The Donabedian Quality Framework offered a foundation for the study of NPLCs in this study. The definition of quality depends on the context of assessment. In this study, quality was reflected in the diabetes care for patients with multimorbidity (Donabedian 2003). Assessment of quality is achieved through evaluation of structure, process and/or outcome (Donabedian 2003). Structure refers to the conditions in which care is provided, or the way that healthcare is set up. This includes material and human resources as well as organizational characteristics (Donabedian 2003). Process refers to the activities that constitute healthcare, such as diagnosis, treatment, patient education and more. Process activities are carried out by both healthcare providers as well as patients and their families. Outcome is the desirable or undesirable changes that can be attributed to healthcare (Donabedian 2003). In this multiple-case study, the components of structure and process were utilized to evaluate the quality of care for patients with diabetes and multimorbidity at NPLCs.

Setting

The purpose of examination of several cases in a multiple-case study is to recognize multiple realities, but also to seek assertions common to the whole (Stake 2006). With this in mind, the NPLCs that were selected had different levels of organizational maturity, differing community resources and varying healthcare provider complements. The sample included five NPLCs, two located in urban and two in rural centres within the northeast Local Health Integration Network (LHIN) and one located in a rural setting in the North Simcoe Muskoka LHIN. These clinics all have similar issues related to unattached patients and limited healthcare resources (MOHLTC 2010). As the NPLCs included in the study all offered comprehensive PHC and were from the mid-northern region of the province, the findings may not represent NPLCs that have a focused chronic disease approach or that are located in the far north or southern portions of the province.

Methodology

This evaluation of the NPLC model was conducted using a multiple-case study design derived from Stake (2006). In multiple-case studies, data are collected from several sources for each individual case. This study included three types of data

collection: chart audits in each NPLC, NP interviews and a document analysis of policy and organizational features impacting NPLCs. A detailed description of data collection and analysis is available by e-mail request to the corresponding author.

The outcome of the chart audit, NP interviews and NPLC document analysis of organizational information was a set of data about each individual case (NPLC) and analysis of each data set. For example, the chart audit conducted at the five NPLCs produced data for each individual NPLC, which could be analyzed both per case and as a whole to provide themes common across all the NPLCs.

The multiple-case analysis started with the development of a description of each NPLC (Yin 2014). Similarities and outliers about each NPLC in the study were identified and the characteristics of the individual NPLCs were explored related to the NPLC model as a whole. The findings for each NPLC case and the findings for data common to all the NPLC cases were examined (chart audit findings, documents related to the NPLCs and NP interview themes), and themes were derived from each source of data (Stake 2006). The separate themes arising from each of the data sets (chart audits, NP interviews, document analysis of organizational documents) were compared and those common to all NPLC cases were extrapolated (Stake 2006). Patterns among the common themes were identified and assertions were developed from the common themes, as they related to the research questions focused on the quality of care for patients with diabetes and multimorbidity at NPLCs (Stake 2006).

As assertions are not absolutes and can be disputed, the assertions developed about the NPLC model were strengthened by triangulation of data, achieved by corroborating the consistency of findings using data from two or more sources (Yin 2014). Further validation of the assertions was obtained through participant verification of the findings of the NP interviews, biostatistician consultation for chart audit analysis and reflexivity on the part of the researcher (Stake 2006).

Findings

The analysis revealed that although there are some outliers in organizational structures, such as the mix of interprofessional team members and the time and nature of physician collaboration, there were essentially no differences among the five NPLCs in the cross-case analysis, even taking into account the length of time the clinic has been in operation. Four interconnected themes and assertions emerged from this multiple-case analysis.

Given the extensive volume of data, it isn't possible to provide details on the development of each theme. However, Table 1 provides some of the supporting data for each theme that help to demonstrate how the themes arose from analysis of a variety of sources.

Table 1. Samples of supporting data for themes

Theme 1. NP as primary care provider
NP interview: "So the people that are registered under my name, when they actually call in to be booked, the secretaries at the front do their best to book them in with the same NP." (NP#5)
Chart audit: (*n* = 150) 100 (66.7%) patients had appointments with their primary NP more than once in the 12 months preceding the audit; 40 (26.7%) saw their primary NP on almost every visit.
Theme 2. NP recruitment and retention
NP interview: "Provider turnover, maternity leave, definitely impacts how we provide care because we have to adapt … and we still have to function to provide primary care." (NP#4)
Organizational data: Three NPLCs had NP vacancies when chart audit was conducted. All had turnover and/or vacancies within the two years prior to the chart audit.
Theme 3. Healthcare resources
NP interview: "We don't have diagnostics here (in the community) so we offer lab services here at the office … For them to get an eye exam they have to go into (urban centre). If they need a diagnostic, they have to go into (urban centre). If they don't have transportation or finances, then it becomes – let's see what we can kind of arrange. If you're 50 with diabetes and no access, you're kind of out of luck." (NP#3)
Chart audit: Number of patients who had attended a health program in their community, such as a diabetes education program, (*n* = 150) 7 (4.7%).
Theme 4. Patient vulnerability
NP interview: "Basically, client financial restraint is a big one (barrier to multimorbidity care) for us. A lot of them don't have access to transportation just cause we don't have a public bus system, or taxi service in the area, so they either rely on family, friends, when they can. It impacts their ability to come to appointments or follow up. A lot of them cannot afford their medication. It impacts what I can do as a provider or what I can recommend. Another barrier is lack of knowledge in regards to their chronic condition. A lot of them might have been diagnosed 10 years ago, and I find that they still don't quite fully understand what diabetes can do to their system." (NP#6)
Organizational data: Complexity of patients was confirmed in other NP interviews, with staff at NPLCs and Virani (2012).

NP = nurse practitioner; NPLCs = nurse practitioner-led clinics.

Nurse practitioner as primary care provider

This study confirmed that NPs are the primary caregivers at NPLCs and that this role positively impacts the quality of care of patients with diabetes and multimorbidity. The NPs have their own case load, or panel, of patients for whom they have final responsibility. They utilize the expertise of the other members of the interprofessional team, as required. Diabetes care processes are more complete when the patients see their primary NP more often.

The NPLC organizational processes support NP practice and the role as primary provider and allow for increased access for patients with diabetes and multimorbidity. Patients are added to an NP's panel in the order that they "sign up" for clinic services and only when the current patients registered in the clinic are stabilized. Patients are not restricted in the number of visits they can schedule with their

NP and are able to address many problems per visit, which is in contrast to some physician-based practices where patients are only able to address one issue per visit (CPSO 2011). Each clinic has some form of "same-day" appointments and extended hours for at least one day per week to help increase availability of care. These features have contributed positively to the quality of care for patients with diabetes and multimorbidity at NPLCs and exemplify the Ontario Government's mandate for patients to receive quality care in a timely manner (MOHLTC 2015).

Remuneration of healthcare providers at NPLCs has impacted NP practice. NPs are paid by salary. This has given the NPs the flexibility to address many problems per patient visit, conduct home visits and more. Other staff members at the NPLCs are paid by salary, with the exception of physicians. Four NPLCs are funded $800/NP/month for physician consultation (Conference Board of Canada 2012). The fifth NPLC had a physician salary line until 2014 and now receives the same physician remuneration as the other NPLCs. Physicians work as contractors and are onsite at the five NPLCs, on average, one day per week. The result is that NPs in NPLCs have had to be extremely judicious with the cases that are taken to the physician for advice (Virani 2012). The NPs have had to make clinical decisions at the full boundaries of their knowledge, skill and judgment and continue to expand their level of expertise. The NPLC model positions the NPs not only to be the primary care providers but also to grow professionally, related to the need to make complex clinical decisions with limited support.

Nurse practitioner recruitment and retention

Despite the positive influence of the NP as primary care provider, recruitment and retention of NPs is a major issue across all of the NPLCs. It was identified in the NP interviews and organizational data as having a negative effect on the quality of care of patients with diabetes and multimorbidity, largely because NPs remaining in the clinic were left to assume the care of a number of complex patients new to them. All the NPLCs in the study had experienced NP turnover and vacancies in the short period they had been in operation. Three of the NPLCs had NP vacancies during the time that the chart audit was conducted. When NPs left, their patients were shifted to remaining NPs who weren't familiar with the patient files, thus increasing their caseload. New intakes were put on hold. NP turnover and difficulties in recruiting replacements have resulted in a slower intake of patients than had been anticipated and planned.

The issue is well-documented by provincial organizations. NPs in PHC settings have not had an increase in salary and no additional funding for benefits or pensions since 2006. Other organizations have NP salaries that are up to $25,000 higher than those in the PHC sector as well as better benefits and pension packages. NPs are leaving PHC settings for more lucrative positions in these other organizations (AOHC 2013).

The individual NPLC cases have documented this issue, e.g., in published annual reports, Quality Improvement Plans, documents and quarterly newsletters. Additionally, the NPLCs are often located in rural settings, up to an hour's drive from major centres. There is no additional funding to offer incentives for travel to these rural settings, which further exacerbates the issue of NP recruitment and retention. NPLC administrators are creative in providing care for their patients through such things as contracting chiropractic services with unfilled NP salary funding. Telemedicine is used for very limited roles, such as consultation with a dermatologist. However helpful these additional services are, they don't replace access to a primary care provider.

When NPs leave NPLCs for other healthcare settings, they are most often replaced by less experienced or newly graduated NPs. The result is less experience and less primary care expertise in the clinic environment. There is currently no mentoring or internship program for new NP graduates (DiCenso et al. 2010). This adds stress on the more experienced NPs who remain in the clinic. It also results in less access to service and, potentially, poorer quality of care.

As this article was being written, the Government of Ontario announced an increase of $85 million over three years to support PHC organizations, including NPLCs, in recruitment and retention of interprofessional staff (Tetley et al. 2016). This development has the potential to ensure the stability of NP staff at NPLCs. However, the extent to which the funding increase provides incentives to NPs to take positions at and remain in NPLCs is yet to be seen.

Healthcare resources

The location of the NPLC impacts the quality of care for patients with diabetes and multimorbidity at the organization. Such things as health promotion programs and diagnostic clinics (e.g., to have bloodwork drawn) are not available in the smaller communities, or are not easily available to vulnerable patients without support to travel to or attend these services. The result is that the NPLCs have used the funding available to them from healthcare provider salaries to train and schedule staff to do things such as draw blood. These are cost burdens that are not felt in the same way by other organizations that receive community development funds or are located in communities where these additional services exist.

In this study, attending a community program was significantly associated with better diabetes care. Issues of recruitment and retention of all healthcare professionals in the NPLCs have meant fewer resources to implement and maintain programs "in-house." The impact of lack of access to healthcare resources and community supports is additional cost and human resource burden on the NPLCs that consequently impact the quality of care.

Patient vulnerability

NPLCs don't interview and turn patients away if they don't meet the mandate or quota of the organization. Patients register from a waiting list based on the timing of their request to be part of the clinic (Virani 2012). In addition, the NPLCs in the more rural areas are the only PHC clinics within a wide geographical range. A large number of the patients taken into the NPLCs have not had PHC for years and have numerous issues, including diabetes and undiagnosed conditions. The result is that the NPLCs have many vulnerable patients who require more time and attention to address both complex medical and social issues. The complexity of this group has an impact on the quality of care of patients with diabetes and multimorbidity in the NPLCs.

Conclusions

This study outlined many issues related to structure and process in NPLCs that influence the quality of care, specifically for patients with complex clinical presentations related to diabetes and multimorbidity (Donabedian 2003). Research arising from these findings could be directed at an exploration of factors related to the recruitment and retention of NPs as well as processes required for NPs to gain and expand clinical competence. NP education curricula should include the concept of the NP as primary provider, modelled by NP preceptors in clinical placements. Professional NP organizations and healthcare agencies should consider the development of mentorship to support novice NPs.

Healthcare organizations and government would be well-served to recognize the unique experience of NPs in NPLCs and the organizational factors that facilitate or impede higher quality of care. Ongoing evaluation of the impact of recently announced funding for PHC organizations should be conducted to ensure that the objective of recruitment and retention of experienced NPs in the NPLCs is achieved. Flexible funding or other strategies that recognize the lack of community resources and patient vulnerability faced by NPs at NPLCs are paramount to improving the quality of care for chronically underserved populations in this model.

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