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Perspectives of Nurse Practitioner-Physician Collaboration among Nurse Practitioners in Canadian Long-Term Care Homes: A National Survey

Introduction

With the increasing complexity of the long-term care (LTC) home population (Grabowski et al. 2012; Young et al. 2015), access to primary care is a necessity. However, ensuring timely primary care in LTC homes is challenging. Studies have found that only a small percentage of family physicians provide care in LTC settings (Lam et al. 2012; Katz et al. 1997), that physicians are spending less time in LTC (Chan 2002) and that a high proportion of physicians plan to reduce their time in LTC (Kane et al. 2003). In Canada, the proportion of family physicians who reported working in LTC dropped from 22.1% in 2007 (National Physician Survey 2007) to 14.1% in 2014 (National Physician Survey 2014). Other challenges include inadequate training in geriatrics (Levy et al. 2007), poor remuneration (Kane et al. 2003; Frank et al. 2006), lack of specialist support (Frank et al. 2006) and excessive paperwork (Levy et al. 2007).

The nurse practitioner (NP) role was introduced in Canadian LTC homes as a way to enhance availability and access to primary care (Dicenso et al. 2007; Philpot et al. 2011; Donald et al. 2013). Collaboration between physicians (MDs) and NPs is an important contributor to quality care (Keith and Askin 2008). However, there has been relatively little research examining collaboration between MDs and NPs in LTC home settings.

In a survey of U.S. LTC Medical Directors, 63% of respondents reported that NPs were involved in the care of their LTC residents, providing acute, preventative, palliative and wound care, and 90% were satisfied with the NPs' practice (Rosenfeld et al. 2004). A survey of NPs and MDs in Ontario, Canada, Donald et al. (2009) also found a high degree of collaboration between MDs and NPs; however, MDs reported a greater extent of collaboration and higher satisfaction with this collaboration than NPs.

Less is known about factors that may contribute to the collaborative relationship between MDs and NPs in LTC settings. A qualitative study by Stolee and Hillier (2002) involving NPs in LTC homes in

Ontario, Canada, provides some initial evidence. In this study, the NP's role in enabling MDs to be more efficient was identified as a factor that might enhance MD-NP collaboration; whereas, NP workload and the potential impact on MD remuneration were factors that might hinder this relationship. Bakerjian and Harrington (2012) conducted a secondary analysis of Medicare claims to examine use of (visits) by advanced practice nurses (including NPs) and physician assistants compared with MDs. Residents received more primary care visits when they were seen by both advanced practice nurses/physician assistants and MDs than when seen by only MDs. The number of visits received was associated with a number of factors including resident age, diagnosis, and type of resident (short versus long stay). Finally, a recent systematic review examined the impact of substituting NPs, physician assistants and nurses for MDs in providing care to older adults (Lovink et al., 2017). Results from the review indicated that care provided by NPs, physician assistants and nurses is of similar quality to that provided by MDs. The authors also identified that MD unwillingness to share responsibility for residents with other health professionals may serve as a barrier to successfully substituting other health professionals for MDs.

The studies reviewed have both strengths and weaknesses. A strength of the study by Rosenfeld and colleagues (2004) was the large sample size. However, the response rate was low (19%), only medical directors were surveyed (not NPs), and the study was conducted in the United States limiting its generalizability to the Canadian context. The study by Donald et al. (2009) was conducted in Ontario and surveyed both NPs and MDs. While the response rates were high (93% and 82% for NPs and MDs, respectively), the sample size was small. A strength of the systematic review conducted by Lovink and colleagues (2017) was the examination of factors that may help or hinder the substitution of other health professionals for MDs. However, this study was not specific to LTC and included physician assistants and nurses along with NPs. Strengths of the Stolee and Hillier (2002) study were the use of both quantitative (survey) and qualitative (interview) data, and the inclusion of multiple perspectives (administrators, nursing staff, MDs, allied health professionals) in the survey. However, the study

involved only one NP working across three LTC homes. Finally, Bakerjian and Harrington (2012) were able to provide accurate counts of visit data, but visits by NPs were not separated from visits by physician assistants and other advanced practice nurses. In addition, the authors did not explore *how* the various health professionals collaborated.

Collaborative practice is complex and multifaceted (Bridges 2014). Interventions to improve collaborative practice and provide clear information about roles can facilitate collaboration and ultimately improve patient care (Schadewaldt 2013). Given the paucity of research in this area, calls have been made by researchers and LTC professionals to better understand how collaboration between MDs and NPs occurs, including on a daily basis (Donald et al. 2009; American Medical Directors Association 2011), and in identifying factors that support and impede collaboration in LTC (Donald et al. 2009). In response to these calls, we utilized data from a pan-Canadian survey to explore the day-to-day collaboration between NPs and MDs in LTC. This paper is based on data collected as part of a sequential two-phase mixed methods study that examined the integration of NPs in Canadian LTC homes (Martin-Misener et al. 2015). Phase 1 involved a survey of NPs working in Canadian LTC homes and Phase 2 was a qualitative case study examining NP integration. This paper examined how NPs working in Canadian LTC homes described their collaboration with MDs, and whether their perspectives varied based on NP employment status (working full versus part time), the number of LTC homes that NPs served, and NP experience. Because of the paucity of existing evidence to inform this analysis, these factors were selected based on the expertise of our interdisciplinary research team and decision-maker partners as factors that may influence collaboration in the LTC context.

Methods

Design

Data from the Phase 1 NP cross-sectional questionnaire were used.

Participants & Recruitment

There were no existing lists of NPs working in LTC in Canada. Therefore, multiple means were used to identify NPs: investigators' knowledge of NPs working in LTC; input from the study's decision-making partners (e.g., provincial Ministry/Department of Health personnel, professional colleges, LTC homes); advertisements on NP listservs (national and provincial); and contact with authors who had published in the area. The NPs identified through these methods were contacted by email and invited to participate if they worked a minimum of 4 hours per week in a LTC home. Data were collected between July 2009 and September 2010.

Instrument

The NP questionnaire included questions developed by the investigators based on the literature and previous NP studies (Adballah et al. 2005; Bryant-Lukosius et al. 2007; Misener and Cox 2001). It included information on the characteristics of the NPs and their LTC homes, NP role and practice patterns, job satisfaction, and factors that influenced role integration. In this paper, collaboration was defined as "an inter-professional process for communication and decision making that enables the separate and shared knowledge and skills of care providers to synergistically influence the client/patient care provided" (Way et al. 2000: 3). Questions that addressed NPs' perspectives on their collaboration with MDs included a subset of data from the Evercare Nurse Practitioner Role and Activity Scale (ENPRAS) (Abdallah et al. 2005) that was adapted to the Canadian context. The ENPRAS used a Likert scale to measure the frequency of NPs' participation in a variety of activities. Response options were subsequently coded to represent the number of times per year activities were conducted: never (zero times per year), once every three months (four times per year), once a month (12 times per year), once a week (52 times per year), 3-4 times per week (172 times per year), once a day (365 times per year) and more than once a day (730 times per year). Seven ENPRAS items that related to collaboration with MDs were included in this analysis. For the seven ENPRAS items and a subset of other questions, the NPs were asked to respond based on their interactions with the MD they

worked with the most. This was done to limit the burden on NPs as previous research by Donald (2007) found that some NPs in LTC worked with up to 12 MDs.

Statistical Analysis

Summary measures including mean (SD) were used for continuous variables and frequency (%) for categorical variables. Chi-square test or Fisher's Exact test were used to examine association between categorical variables. Because of small sample sizes and the fact that continuous variables were not normally distributed, a non-parametric test (i.e., Mann-Whitney U test), was used to compare between groups. All analyses were conducted using the statistical program Stata version 14.2 (StataCorp. 2015. *Stata Statistical Software: Release 14*. College Station, TX: StataCorp LP).

Ethics approval was obtained from Ryerson University (# 2008-177-2), other universities affiliated with the co-investigators, and numerous provincial and LTC-based Ethics Boards.

Results

Description of Respondents

Questionnaires were sent to 45 NPs across Canada, representing 8 jurisdictions. There were no NPs working in LTC in 5 jurisdictions at the time of data collection. Of the 45 NPs surveyed, 37 (82%) completed the questionnaire. Sixty-two percent of the NPs worked full time (i.e., working at least 75% of their time) in LTC; 38% worked part time. Of the 37 NPs, 59% worked in a single LTC and 41% worked in multiple (two or more) LTC homes. Of those working in multiple homes, 60% (nine) worked in two homes, 26.7% (four) worked in three homes, and 13.3% (two) worked in four homes. In terms of experience working as an NP, the median value was used to identify those with less (less than four years) and more (four years or more) experience. Forty-six percent of NPs were considered to have less experience and 54% to have more experience.

When considering employment status, the number of LTC homes NPs served and experience as an NP, 37.8% (14) NPs worked full time in a single LTC home, 24.3% (9) worked full time in multiple

homes, 21.6% (8) worked part time in a single home, and 16.2% (6) worked part time in multiple homes. Of those who worked full time, 10 had less than four years of experience and 13 had four or more years of experience as an NP. Of the 14 part time NPs, seven had less than four years of experience and seven had four or more years of experience. Among the NPs working in a single LTC home, 13 had less experience as an NP and nine had more experience as an NP. The opposite trend was found for those working in multiple homes – most (11) had more experience as an NP; only four had less NP experience.

All but two of the NPs were female and the majority were between the ages of 25 and 44. Over 50% had a baccalaureate degree and almost 40% had a Master's degree. All but one had a Family/Primary Health Care NP designation; the other NP was a Speciality/Acute Care NP. Over 60% of participants had no experience working as an RN in LTC prior to starting their NP practice (Table 1). When comparing the characteristics of NPs who worked full time versus part time, those working in a single LTC home versus multiple homes, and those with more and less experience as an NP, there were associations between: a) NPs' age and whether they worked in a single LTC home versus multiple homes (younger NPs were more likely to work in a single home); b) NP's years of experience and working in single versus multiple homes (NPs working in multiple homes were likely to have more years of experience); and c) having a CNA certificate and working full time versus part time (NPs working full time were more likely to have a certificate).

NPs most often reported a nursing director as their direct supervisor, followed by a LTC administrator. Full time NPs were significantly more likely to report to a nursing director than NPs working part-time ($p=0.05$), and NPs working in multiple LTC homes were significantly more likely to report a physician as their direct supervisor than NPs working in a single LTC home ($p=0.007$).

Table 1. Characteristics of NPs by Full Time/Part Time Status, NPs Working in Single/Multiple LTC Homes & NPs with Less/More Experience

Characteristic	Working Full Time in LTC* (N=23)	Working Part Time in LTC (N=14)	Working in Single LTC Home (N=22)	Working in Multiple LTC Home (N=15)	NPs with Less Experience (N=17)	NPs with More Experience (N=20)	TOTAL (N=37)
Female	100% (23)	85.7% (12)	100% (22)	86.7% (13)	94.1% (16)	95.0% (19)	94.6% (35)
Male	0%	14.3% (2)	0%	13.3% (2)	5.9% (1)	5.0% (1)	5.4% (2)
Age Group							
25 – 44 years	39.1% (9)	35.7% (5)	50.0% (11) ⁺	20.0% (3) ⁺	47.1% (8)	30.0% (6)	37.8% (14)
45 – 54 years	34.8% (8)	50.0% (7)	40.9% (9) ⁺	40.0% (6) ⁺	41.2% (7)	40.0% (8)	40.5% (15)
55 – 70 years	26.1% (6)	14.3% (2)	9.1% (2) ⁺	40.0% (6) ⁺	11.8% (2)	30.0% (6)	21.6% (8)
Highest level of education							
Nursing diploma	8.7% (2)	14.3% (2)	13.6% (3)	6.7% (1)	0	20.0% (4)	10.8% (4)
Baccalaureate	52.2% (12)	42.9% (6)	50.0% (11)	46.7% (7)	52.9% (9)	45.0% (9)	48.6% (18)
Master's	39.1% (9)	42.9% (6)	36.4% (8)	46.7% (7)	47.1% (8)	35.0% (7)	40.5% (15)
Licensed NP designation							
Family/Primary Health Care/All Ages NP	95.7% (22)	100% (14)	95.5% (21)	100% (15)	94.1% (16)	100% (20)	97.3% (36)
Specialty/Acute Care NP	4.3% (1)	0	4.5% (1)	0	5.9% (1)	0	2.7% (1)
Geriatrics Education & Certification [†]							
Course(s) with geriatric theory	56.5% (13)	50.0% (7)	59.1% (13)	46.7% (7)	52.9% (9)	55.0% (11)	54.1% (20)
Clinical NP experience with geriatric population	56.5% (13)	71.4% (10)	59.1% (13)	66.7% (10)	58.8% (10)	65.0% (13)	62.2% (23)
CNA certification	39.1% (9) ⁺	0 ⁺	18.2% (4)	33.3% (5)	17.6% (3)	30.0% (6)	24.3% (9)
Other	21.7% (5)	0	9.1% (2)	20.0% (3)	17.6% (3)	10.0% (2)	13.5% (5)
None	8.7% (2)	0	9.1% (2)	13.3% (2)	5.9% (1)	15.0% (3)	10.8% (4)
Years of experience as an RN in LTC prior to NP practice ^{††}							
0 years	60.9% (14)	64.3% (9)	59.1% (13)	66.7% (10)	58.8% (10)	65.0% (13)	62.2% (23)
1 – 4 years	8.7% (2)	21.4% (3)	13.6% (3)	13.3% (2)	5.9% (1)	20.0% (4)	13.5% (5)
5 – 9 years	13.0% (3)	0	13.6% (3)	0	11.8% (2)	5.0% (1)	8.1% (3)
10 or more years	17.4% (4)	14.3% (2)	13.6% (3)	20.0% (3)	23.5% (4)	10.0% (2)	16.2% (6)
Direct supervisor(s) [†]							
Administrator	34.8% (8)	42.9% (6)	27.3% (6)	53.3% (8)	23.5% (4)	50.0% (10)	37.8% (14)
Nursing Director	56.5% (13) ⁺	21.4% (3) ⁺	50.0% (11)	33.3% (5)	47.1% (8)	40.0% (8)	43.2% (16)
Physician	13.0% (3)	14.3% (2)	0 ⁺⁺	33.3% (5) ⁺⁺	5.9% (1)	20.0% (4)	13.5% (5)
Other ^{***}	17.4% (4)	28.6% (4)	27.3% (6)	13.3% (2)	29.4% (5)	15.0% (3)	21.6% (8)

Note: The full time NPs included one NP who worked 4 days per week in LTC and one day a week collaborating between LTC and an emergency department to avoid unnecessary transfers from the LTC home.

^t More than one response could be provided

^{tt} Years of experience data were categorized because the data were very skewed

^{**} “Other” includes managing chronic disease in aging populations; participation in geriatric assessment outreach program; NICHE- Geriatric Resource; enrolled in Fitzgerald Geriatric Exam Review

^{***} “Other” includes other managers or directors within LTC or primary care

⁺ $p < 0.05$, ⁺⁺ $p < 0.01$

Type and Frequency of NP-MD Collaboration

NPs reported working with an average of 3.4 MDs on a regular basis, ranging from 1 to 26 MDs (Table 2). The difference in the average number of MDs that the NPs worked with was marginally significant for full time compared with part time NPs (means of 4.1 and 2.0 for full time and part time NPs, respectively; $p=0.06$). The difference in the number of MDs that NPs worked with was not statistically significant between NPs working in single versus multiple LTC homes ($p=0.83$), or between NPs with more and less experience ($p=0.22$). In the remainder of the questions about their collaboration with MDs, NPs based their responses on the MD they collaborated with most frequently.

Table 2. Average Number of MDs the NPs work with on a Regular Basis

Number of MDs the NPs Work with on a Regular Basis	Working Full Time in LTC (N=23)	Working Part Time in LTC (N=14)	Working in Single LTC Home (N=22)	Working in Multiple LTC Home (N=15)	NPs with Less Experience (N=17)	NPs with More Experience (N=20)	TOTAL (N=35)
Mean	4.1 ⁺	2.0 ⁺	3.4	3.4	4.8	2.1	3.4
SD	5.6	1.7	5.2	3.9	6.6	1.5	4.7
Min - Max	1 - 26	1 - 6	1 - 26	1 - 15	1 - 26	1 - 7	1 - 26

⁺ $p < 0.05$

NPs reported that they collaborated with MDs an average of 8 hours per month; however, estimates ranged from >1 to 45 hours per month (Table 3). There was a statistically significant difference between the average number of hours of collaboration among full time versus part time NPs ($p=0.03$), but not between NPs working in single compared with multiple homes ($p=0.18$) or NPs with more versus less experience ($p=0.31$).

Table 3. Average Number of Hours per Month NPs Collaborate with MDs

Number of Hours per Month spent Collaborating with MD	Working Full Time in LTC (N=23)	Working Part Time in LTC (N=14)	Working in Single LTC Home (N=22)	Working in Multiple LTC Home (N=15)	NPs with Less Experience (N=17)	NPs with More Experience (N=20)	TOTAL (N=37)
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Mean	8.7 ⁺	6.5 ⁺	7.7	8.2	9.8	6.2	7.88
SD	8.0	11.7	6.4	13.0	12.1	7.1	9.61
Min – Max	1 – 32	0.5 – 45	0.5 - 45	0.5 – 32	0.5 - 45	1 - 24	0.5 – 45

⁺ p < 0.05

The primary reasons for MD collaboration related to resident needs (100% of NPs) and family needs (87% of NPs). In terms of communicating with MDs, all of the NPs (100%) reported that they had opportunities to communicate with MDs in person. Telephone contact was also very common (reported by 95% of NPs). Other means of communication included email (51%), fax (38%), and health records (38%). There were no statistically significant differences in the areas of collaboration or means of communication among NPs who worked full versus part-time, NPs working in single versus multiple homes, or NPs with more versus less experience.

There were statistically significant differences between full time and part time NPs in the average number of times they reported engaging in the following activities: a) calling the physician with resident status changes, b) collaborating with the physician for diagnosis and management of residents with acute conditions, c) conducting rounds on residents with the physician, and d) discussing advance directives with the physician (Table 4). The number of times NPs participated in each of these activities was significantly higher for full time compared with part time NPs. There were no statistically significant differences between NPs working in single versus multiple homes, or between NPs with more versus less experience, in any of these activities.

Table 4. Number of times per Year that NPs Collaborate with MDs in various areas: Means (and Standard Deviations) of Selected ENPRAS Items

ENPRAS Item	Full Time NPs (N=23)	Part Time NPs (N=14)	NPs Working in Single Homes (N=22)	NPs Working in Multiple Homes (N=15)	NPs with Less Experience (N=17)	NPs with More Experience (N=20)	Total (N=37)
Collaborate with MD	195.3 (206.9)	157.7 (247.5)	193.8 (233.3)	162.5 (206.8)	211.6 (254.2)	155.1 (190.2)	181.1 (220.5)
Call MD with resident status change	142.6 (164.5) ⁺⁺	28.6 (44.1) ⁺⁺	107.6 (166.5)	87.5 (102.9)	84.1 (96.3)	112.6 (174.5)	99.5 (142.8)
Collaborate with MD for diagnosis, management of resident (acute condition)	140.7 (165.9) ⁺⁺	40.3 (43.2) ⁺⁺	100.1 (108.8)	106.5 (182.9)	114.5 (172.3)	92.7 (112.0)	102.7 (141.2)
Collaborate with MD for diagnosis, management of resident (chronic condition)	119.0 (168.6)	40.0 (43.5)	76.6 (104.6)	107.3 (182.4)	88.6 (172.9)	89.5 (109.0)	89.1 (139.9)
Discuss advanced directives with MD	83.6 (164.7) ⁺⁺	6.9 (13.9) ⁺⁺	35.7 (78.6)	79.1 (185.6)	22.1 (23.2)	82.1 (179.8)	53.8 (133.4)
Communicate information to MD via fax transmissions	78.7 (169.4)	6.6 (13.7)	70.0 (173.4)	23.5 (46.0)	66.1 (182.3)	38.3 (87.2)	50.6 (136.2)
Conduct rounds on resident with MD	40.7 (49.6) ⁺⁺	2.2 (4.5) ⁺⁺	35.2 (51.2)	10.9 (18.7)	24.5 (25.3)	27.2 (55.1)	25.9 (43.1)

⁺⁺ p < 0.01

Overall, NPs were satisfied with the collaborative relationship they had with the physician they worked with most frequently, with all NPs providing ratings of 4 or greater on a 6-point scale (see Table 5). There were no statistically significant differences in satisfaction ratings among NPs working full versus part time, those working in single versus multiple homes, or those with more versus less NP experience.

Table 5. Satisfaction with Collaborative Relationship with Physician

	Full Time NPs (N=23)	Part Time NPs (N=14)	NPs Working in Single Homes (N=22)	NPs Working in Multiple Homes (N=15)	NPs with Less Experience (N=17)	NPs with More Experience (N=20)	Total N=37
Mean	5.52	5.43	5.55	5.40	5.53	5.45	5.49
SD	0.65	0.62	0.66	0.61	0.62	0.62	0.64

Rated on a 6-point scale where 1=very dissatisfied and 6=very satisfied.

NPs' perception of physician acceptance of their role was highest for medical directors, followed by family physicians/general practitioners, and specialists (Table 6). There were no significant differences in perceptions of acceptance among full versus part time NPs, NPs working in single versus multiple homes, or NPs with more versus less experience.

Table 6. NPs' Perceptions of Physician Acceptance of NP Role; Mean (SD)

	Full Time NPs (N=23)	Part Time NPs (N=14)	NPs Working in Single Homes (N=22)	NPs Working in Multiple Homes (N=15)	NPs with Less Experience (N=17)	NPs with More Experience (N=20)	Total N=37
Medical Directors	4.73 (1.14)	5.15 (0.77)	4.71 (1.08)	5.14 (0.91)	4.6 (1.12)	5.1 (0.97)	4.89 (1.04)
Family Physicians / General Practitioners	4.65 (1.0)	4.85 (0.95)	4.86 (0.87)	4.5 (1.12)	4.7 (0.95)	4.8 (1.07)	4.72 (0.99)
Specialist Physicians	4.28 (0.99)	4.18 (0.94)	4.08 (0.98)	4.55 (0.89)	4.3 (1.10)	4.2 (0.91)	4.24 (0.97)

Rated on a 6-point scale where 1=not accepted and 6=extremely well accepted.

Discussion

This study addresses a significant gap by providing insight into the nature of day-to-day collaboration between NPs and MDs in LTC. It also explored some factors that may help and hinder this collaboration.

NPs reported the number of MDs they collaborated with (across all LTC homes they worked in) and the average number of hours per month spent collaborating with the MD they collaborated with most frequently. Few other studies provide similar data for the LTC context; however, comparisons can be made between these findings and those by Donald et al. (2009). In her study of 15 NPs working in Ontario LTC homes, NPs reported working with an average of four MDs, and spent an average of 5.75 hours/month collaborating with the MD they collaborated with most frequently. In the current study, NPs reported working with an average of 3.4 MDs, and spent almost eight hours per month collaborating with the MD they collaborated with most often. Satisfaction with the collaborative relationship with the MD they worked with most frequently was assessed using the same question in both studies. The average satisfaction rating in the current study was higher (5.49) compared with that in the Donald et al. study (4.37). There are a number of possible reasons for these differences. In terms of the NP-MD relationship, having more opportunities for collaboration with MDs may be associated with higher ratings of satisfaction by NPs, or there may have been greater acceptance/familiarity with the NP role by MDs. The different samples in the two studies (i.e., province versus national) may also have contributed to these differences.

Results from the ENPRAS scale provided the estimated number of times per year that NPs collaborated with MDs in seven areas. The most frequently occurring activities related to general collaboration, collaborating regarding the diagnosis and management of acute issues, and contacting the MD regarding resident status changes. Abdullah et al. (2005) developed and used the ENPRAS scale to examine NP activities in EverCare nursing homes in the United States; these homes employed a collaborative primary care model where MDs and NPs worked together to care for long-stay

residents. The same three activities were also the most commonly occurring activities in the Abdullah et al. study. The majority (93%) of NPs in Abdullah et al.'s study were full time. Thus, when comparing her results to those of full time NPs in the current study, the estimated number of times NPs reported engaging in the various activities is fairly similar, with two exceptions. Full time NPs in the current study reported collaborating with MDs regarding the diagnosis and management of acute conditions an average of 141 times per year compared with 118 times per year in the Abdullah et al. study. Similarly, full time NPs in the current study reported collaborating with MDs in diagnosing and managing chronic conditions an average of 119 times in the current study compared with an average of 68 times in the Abdullah study. These may reflect differences in the ways NPs and MDs collaborate in EverCare homes and Canadian LTC homes, and/or differences in the resources available to NPs to assess and intervene with residents as Canadian LTC homes have fewer resources available than EverCare homes. However, it is important to note that data in the Abdullah et al. (2005) study were collected at least five years prior to the data in the current study. Thus, differences may represent an evolution in the way NPs and MDs work together, particularly as resident complexity has increased.

The methods that NPs and MDs used to communicate were the same regardless of whether they worked full or part time, worked in one or in multiple homes, or had more or less experience as an NP. All NPs had opportunities for in-person contact with MDs, and almost all (95%) communicated with the MD via telephone. Almost 40% communicated using health records, although it is not clear if these were electronic or paper-based. Uptake of electronic medical records has been slow in LTC homes (Brandeis et al. 2007). However, this medium has great potential to enhance the frequency and timeliness of NP-MD communication.

NPs working Full versus Part time, NPs Working in Single versus Multiple Homes, and NP Experience

Perceptions of NP-MD collaboration were compared in NPs working full versus part time, NPs working in one versus multiple homes, and NPs with more versus less NP experience – factors that may help or hinder NP-MD collaboration. Most differences were found between full and part time NPs.

Some of these differences were not surprising and likely reflect the increased time that full time NPs spend in the homes (e.g., full time NPs reported engaging in the ENPRAS items more frequently than part time NPs; full time NPs also reported working with a significantly higher number of MDs and spent a greater amount of time collaborating with the MD they collaborated with most frequently). However, other comparisons between full and part time NPs were not significantly different (e.g., NPs' satisfaction with the collaborative relationship with MDs and NPs' perceptions of physician acceptance of their role), which was somewhat unexpected. Surprisingly, there were also no significant differences in collaboration between NPs working in single versus multiple LTC homes. This is contrary to the results of Donald et al. 2009, who found that time spent collaborating with MDs was less among NPs working in multiple LTC homes. Research that explores how NPs who work in multiple homes collaborate with physicians may provide more insight into the nature of this collaboration and identify ways it could be enhanced. There were also no differences between NPs with more versus less NP experience. This unexpected finding could relate to how we defined 'experience'. In the current study, the median value (four years) was used to determine those with more versus less experience. Research from primary care indicates that the first year of practice is the most difficult in terms of transitioning to the full NP scope of practice (Brown and Olshanky 1997). Thus, while NPs with two or three years of experience were considered to have 'less' experience in our analyses, these NPs may have been more similar to NPs with more experience. Unfortunately, the relatively small size of our sample does not allow us to conduct these analyses.

Strengths and Limitations

This study was the first pan-Canadian survey of NPs working in LTC. Significant efforts were made to identify all NPs working in this setting. While some NPs may have been missed, the findings provide a strong basis for examining NP-MD collaboration in Canadian LTC homes. In terms of limitations, despite efforts to identify LTC NPs the sample was relatively small and, as a result, there

was significant variation in some of the survey responses. In addition, the study did not explore all aspects of NP-MD collaboration. For example, how NPs and MDs worked together to make decisions about patient care were not examined in the survey. As well, findings only provided NPs' perspectives on their collaboration with MDs – the MD perspective was missing. It is also important to note that the data in this study were collected before 2011, a time when there were more restrictions on NP practice. For example, until 2012 federal legislation prohibited Canadian NPs from prescribing controlled drugs and substances (Ambrose & Tarlier, 2013). This restriction was known to impede NPs' independent ability to meet the pain management needs of residents in LTC (Kaasalainen et al. 2007; Kaasalainen et al. 2010). Evidence from the United States in Washington State, which has authorised independent NP prescribing of controlled substances since 2005, indicates it has resulted in improved accessibility to care for patients and reduced system costs by eliminating the need for consultation with a physician (Kaplan et al., 2010). Many other restrictions on NP practice that would have had a similar impact on accessibility and cost also were not removed until 2011 or 2012. Examples include the types of investigations NPs could order, the breadth of the formulary from which NPs could prescribe, and admission and discharge privileges (Ontario Hospital Association, 2012). These restrictions, still in place at the time of our data collection, may have affected our NP-MD collaboration results, and the lifting of these restrictions may mean that NP-MD collaboration looks different today. Future research on the impact of the expanding NP role on NP-MD collaboration in LTC would be of interest.

Another limitation of the study relates to the results from the ENPRAS tool. These findings must be considered with caution as the data were drawn from NPs' self-reported estimates of time spent on numerous activities. Indeed, there was significant variability in the estimates given which may be a function of the self-reported nature of the tool, the variability in activities and priorities of individual NP roles, or a combination of these factors. Nevertheless, the ENPRAS scale did produce results that were expected (e.g., full time NPs engaged in more collaborative activities than part time NPs), giving some confidence in the data obtained. The ENPRAS results were also generally comparable with those

from the EverCare homes (Abdallah et al. 2005). Finally, the current study focused on the provision of primary care in LTC by NPs. However, some LTC NPs work in a consultative model (McAiney et al. 2008) where the goal is to reduce unnecessary transfers to hospitals. In such models, collaboration may look and be perceived quite differently. Despite these limitations, the findings provide some insights into NP-MD collaboration and serve as a baseline upon which future research can be built. This is of particular importance given the expansion of NP positions and models of care in LTC (Frisque, 2014; Ontario Ministry of Health and Long Term Care, 2017).

Conclusion

Collaboration between NPs and MDs in LTC settings can have positive impacts on residents (Philpot et al. 2011; Aigner et al. 2004), yet little research on NP-MD collaboration in this setting exists. By better understanding the nature of day-to-day collaboration between NPs and MDs, and factors that can affect this collaboration, interventions that can help to enhance collaboration can be developed, implemented and evaluated. Including the perspective of LTC physicians as well as other providers, residents and families will be essential to understanding the impacts of such interventions on NP-MD collaboration.

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