ORIGINAL ARTICLE

A mixed-methods pilot study of the factors that influence collaboration among registered nurses and registered practical nurses in acute care

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ABSTRACT

Objective: Staffing models employing registered nurses (RNs) and registered practical nurses (RPN) have created the opportunity for enhanced collaboration in acute care settings. However, little is understood about how these nurses collaborate and the factors that influence their collaboration. The purpose of this pilot study was to examine the factors that influenced collaboration among RNs and RPNs at one acute care hospital in Canada in order to understand and improve nursing collaborative practice.
Methods: Using an explanatory, sequential mixed methods design, data were collected over several months in 2016 from the nurses using a questionnaire and individual telephone interviews. Sixty-five RNs and RPNs working on medical, surgical and emergency units completed the "Nurse-Nurse Collaboration Scale" survey and ten RNs and RPNs participated in the telephone interviews.
Results: Quantitative analysis showed lower scores among younger nurses across most domains of the survey: conflict management, communication, shared processes, coordination and professionalism. Qualitative analysis revealed working to full scope of practice was a facilitator of RN-RPN collaboration, and older age and poor interpersonal skills were barriers to successful collaboration.
Conclusions: The results provide discussion for identification of strategies to improve collaborative practice among nurses such as establishing joint education programs for RNs and RPNs, and the use of models or frameworks to guide collaborative practice in healthcare organizations.

Key Words: Collaboration, Intraprofessional, Registered nurse, Registered practical nurse, Mixed methods design

1. INTRODUCTION

Changes in Canada's healthcare system over the last twenty years have resulted in the development of new healthcare delivery models, many based on collaborative teamwork among nurses.[1] Historically, nursing positions in acute care settings have been primarily staffed with registered nurses (RNs); however, the number of registered practical nurses (RPNs) in these settings is on the rise due to the financial constraints of healthcare organizations.[2]

RPNs or licensed practical nurses (LPNs) are individuals who have completed a certificate or 2-year community college program and successfully passed a practical nurse registration examination.[3] To practice as a registered nurse, individuals have completed a college diploma or four year

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baccalaureate nursing degree and passed a registration examination.[3] RNs and RPNs study from a similar body of nursing knowledge, but the knowledge base of the RN is broader and more comprehensive. As a result, there is a higher level of critical thinking and autonomous practice for the RN compared with the RPN.[4]

2. BACKGROUND

Standards for nursing practice mandated by various nursing association requires all nurses to work collaboratively with each other and with other health care professionals, patients and their caregivers.[5,6] In the context of nursing, collaboration is considered a relational process among colleagues who share similar professional values, socialization, philosophy and experience.[7] Nursing collaborative practice is described as members of the nursing profession working together to deliver high quality, safe, patient-centered care.[8] The American Association of Critical Care Nurses (AACCN) report on the Standards for Establishing and Sustaining Healthy Work Environment says effective collaborative teamwork requires nurses to engage in a process that is synchronous, built over time, and results in a work culture that becomes the norm.[9]

Collaboration, knowledge and skills are recognized as essential to the successful performance of all healthcare providers, including nurses.[10] As health care professionals, nurses depend on collaboration for the delivery of quality patient care. According to a study done by Lavoie-Tremblay et al., nurses associated a healthy work environment with a culture of respectful and collaborative communication, and social support from colleagues.[11] Collaboration is influenced by several factors including individual values and norms, supportive structures, and most importantly, the willingness and competency of team members to engage in collaboration.[12] Research has shown that effective collaboration provides the best outcomes for patients, nurses and organizations. Wheelan, Burchill and Tilin reported that clinical practice units where nurses perceived they were functioning at higher levels of collaboration had lower patient mortality rates than on units with lower perceptions of team effectiveness.[13] Kalisch and Lee found that strong nursing collaboration was associated with a reduction in errors of omission (e.g., not giving medication, nor providing patient health teaching).[14] Effective nursing collaboration is correlated with higher quality of patient care and improved patient safety.[15,16] Previous studies have shown that collaboration improved nursing outcomes such as better work environments,[17] enhanced job satisfaction,[18] increased retention rates and greater productivity.[19] Alternatively, ineffective collaboration can have a negative impact on nursing collaborative practice because of poor interpersonal interactions, hierarchical attitudes and beliefs and bullying behaviours.[20]

Nurse-nurse collaboration in acute care settings has received little attention in the literature. Friese et al. found that the quality of collaborative nursing practice influenced patient outcomes in surgical oncology units.[21] Kalisch and Lee reported that the level of nursing collaborative teamwork was associated with missed nursing activities on acute care units such as the late administration of prn (as needed) medications.[14] Moore and Prentice found that oncology nurse practitioners and RNs believed effective collaboration had a positive impact on patient care, and alternatively, poor collaboration negatively affected patient care.[22] Collaboration among nurses was influenced positively and negatively by several factors: culture of the organization,[16] supportive nursing leadership,[23,24] and the individual interpersonal skills of nurses.[8] Collaborative practice was considered a key element of healthy workplaces for nurses with recommendations for enhancing collaborative teamwork highlighted by the Registered Nurses Association of Ontario (RNAO) best practice guidelines Collaborative Practice among Nursing Teams, and "Intra-professional Collaborative Practice among Nurses".[25,26]

Optimal patient care requires RNs and RPNs to work together to meet the needs of patients and families. The introduction of RPNs in hospital settings where they have not historically worked has created the opportunity for enhanced collaboration among these different types of nurses, yet has resulted in tensions among RNs and RPNs that threaten teamwork.[27] Despite numerous research studies which have focused on collaboration between nurses and the multiprofessional team, there is a paucity of research on RN-RPN collaboration; particularly in the acute care setting. Thus, it is important for nurses, health professionals, patients and the community as a whole to gain an understanding of the factors that influence the relationship between RNs and RPNs in order to improve collaborative practice among all nurses.

Aim

The purpose of this pilot study was to examine the factors that influenced collaboration among RNs and RPNs at one acute care hospital in Canada in order to understand and improve nursing collaborative practice.

3. METHODS

3.1 Design

A pilot study was conducted over several months in 2016 using an explanatory sequential mixed methods design.[28] A two stage design offered a pluralistic approach that enabled the researchers to collect qualitative data that augmented the primary source of quantitative data.[28] Phase one entailed us-

ing a survey tool to gather participants' demographic data, information regarding the collaborative behaviours among RNs and RPNs, and the key components of nurse-nurse collaboration. To further understand the quantitative results, phase two collected qualitative data using individual telephone interviews that offered a descriptive approach to obtaining an in-depth understanding of RN and RPNs' perceptions of how they collaborated, and the factors that encourage and/or discourage collaboration.

3.2 Participants and setting

The study was conducted at one 200 bed acute care hospital in Canada. The setting included three patient care units that employed an RN-RPN staffing model. All 180 RNs and RPNs working on three different types of patient care units were purposefully approached to participate in the quantitative stage of the study during study information sessions held at the hospital by research team members. Maximum variation sampling was used to collect a wide range of perspectives from nurses about collaboration on medical, surgical, and emergency department [critical care] units. Because of the exploratory nature of the research, Thabane et al. suggests that pilot studies require sample sizes of between 10 to 30 participants.[29] The quantitative sample included 50 RNs and 15 RPNs with the majority of nurses working in the emergency department. While recruitment was successful in the emergency department, recruitment was limited on the medical and surgical units. To increase participation on the medical and surgical units, the researchers conducted several more study information sessions on these units. A total of 65 nurses completed the survey. The qualitative sample included 10 nurses recruited from the survey: 3 RNs and 2 RPNs from the emergency department, 2 RNs and 1 RPN from the surgical unit, and 1 RN and 1 RPN from the medical unit. One of the RNs from the emergency department had recently transferred from the medical unit and provided answers to the telephone interview questions based on both patient care unit experiences.

3.3 Data

3.3.1 *Quantitative data collection and analysis*

Quantitative data were collected using a questionnaire that included an 8 item sociodemographic form (nurse type, gender, age, level of nursing education, years working as a nurse, clinical practice setting) and the Nurse to Nurse Collaboration Scale (NNCS).[30] The NNCS consists of 35 items across five sub domains of collaboration: conflict management, 7 items; communication, 8 items; shared processes, 8 items; coordination, 5 items; and professionalism, 7 items, with participants indicating their response along a four-point Likert Scale ranging from "1 = strongly disagree to 4 = strongly agree". Psychometric testing of the NNCS included pilot testing for content and construct validity with recognized experts in the field.[30] A modified scale was field tested with staff nurses in four tertiary care centers in the United States, and overall Cronbach's alpha was 0.89. Convergent validity was low to moderate, showing five separate subdomains rather than a single global concept of nurse-to-nurse collaboration.[30] The five subdomains had acceptable internal consistency ranging from 0.66 to 0.91.[30] The questionnaire took participants approximately 15 minutes to complete. Participants were asked at the end of the questionnaire if they would be interested in being contacted for a follow-up interview. The Statistical Package for the Social Sciences (SPSS) version 19 software was used for data analysis.[31] Data cleaning was conducted through two different ways. One participant's responses were deleted as the majority of answers were not filled out. There were also several participants who omitted a few questions therefore imputation was done by substituting missing values with mean values. Quantitative data were analyzed using descriptive statistics and analysis of variance (ANOVA). Assumptions of factorial ANOVA were reviewed and examined. A factorial ANOVA was conducted to examine the differences between nurse type and other dependent variables. Within the analysis, we determined if there were any significant interactions and if so, simple effects were examined to see if they were significant and then simple comparisons were made. If the data were shown not to have any significant interactions, main effects were examined and if significant then main comparisons were made. Post hoc tests were done to see if there were any interaction effects between nurse type and dependent variables. Sample size of RN and RPNs differed significantly due to fewer RPNs employed on each of the clinical units at the hospital. Therefore some caution should be taken while interpreting the results as we did not have equal sample sizes. Given the current research is an exploratory pilot study, statistical significance was set at $p < .05$.

3.3.2 *Qualitative data collection and analysis*

Qualitative data were collected using individual telephone interviews over approximately 30 minutes during unpaid work time, with the date and time selected by the participant. Using a semi structured interview guide the nurses were asked to share their experiences of collaboration with RNs or RPNs on their respective units, and their perceptions of factors that encourage and discourage collaborative relationships with their nursing colleagues. The interview guide included the following questions:

(1) How do nurses (RNs & RPNs) collaborate on your unit/floor?

(2) How do you collaborate with RNs or RPNs on your unit/floor?

- What factors encourage how you collaborate with other RNs/RPNs?
- What factors discourage how you collaborate with other RNs/RPNs?
- Are you satisfied with this level/type of collaboration with other RNs/RPNs on your unit? Why? Or why not?
- How do you think this level/type of collaboration with other RNs/RPNs affects patient care?

A thematic analysis was conducted of the interview transcripts.[24] Each interview was audio recorded, transcribed, and reviewed for accuracy by the interviewer. Coding was first completed by hand (pen and paper) by each individual researcher. After initial coding, data was imported into NVIVO version 10 (QSR International, 2014) which was used to facilitate analysis and organize the data from each transcript.[32] Once preliminary themes were identified, member checking activities were undertaken and participants were contacted to check the findings. Two nurses responded and provided feedback validating the key findings from the interview data. This was followed by discussion among the researchers to achieve consensus on themes that best described the data.

In order to promote rigour of the study, Lincoln and Guba's criteria were used.[33] Credibility was achieved by conducting member checks with the participants. Triangulation of the data sources (quantitative and qualitative) was also employed. Researcher triangulation was promoted through having all researchers involved with the qualitative data analysis, development and refinement of themes. Transferability was achieved through description of the participants and quotations to illustrate findings. Confirmability was established through use of an audit trail. Once the quantitative and qualitative results were interpreted and summarized, the researchers discussed ways the qualitative results helped to explain the quantitative results, and overall what was learned from the study.[29]

3.4 Ethical considerations

The study was approved by the research ethics boards at the university and the hospital where the study was conducted. Confidentiality of the participants was ensured by using individual coding numbers (example – RN001) for both quantitative and qualitative data. Participants signed a consent form prior to taking part in the interview, and were informed they could withdraw from the study at any time.

4. Results

This study used an explanatory sequential mixed-methods design therefore the results from each phase are presented separately with a synthesis of the findings presented in the discussion section.

4.1 Quantitative results

A total of 65 questionnaires were returned yielding a response rate of 36%. The sample of RNs and RPNs included 57 females and 8 males. Over 60% of the sample was 20-39 years of age. Nearly 40% of RNs and 15% of RPNs had 1-12 years of experience. A four year baccalaureate degree was held by over 60% of the RNs while 67% of RPNs had completed a two year college diploma. Refer to Table 1 for participant demographics.

There were no statistically significant differences found in total collaboration scores of the five combined subdomains (see Table 2). However, the results for the factorial ANOVA indicated a significant main effect between nurse type and clinical unit in the subdomain Communication. Hochberg's GT2 post hoc main effects revealed that emergency department nurses scored significantly higher (M = 3.64, SD = 0.53) than medical (M = 3.29, SD = 0.56) and surgical nurses (M = 3.00, SD = 0.00). A significant difference was also found in the subdomain Coordination. Gabriel post hoc test revealed that medical nurses (M = 3.10, SD = 0.89) scored significantly higher than emergency department nurses (M = 2.05, SD = 0.89). The nurse type (RN vs. RPN) and age in the subdomains of Conflict Management, Communication, and Professionalism were found to be significant at $\leq .05$ level.

RNs and RPNs scored differently based on their age for the subdomain of Conflict Management and the item "The nurses involved will not settle the dispute until all are satisfied with the decision" [F(2, 60) = 4.14, p = .02]. Specifically, RPNs 40-49 years of age (M = 3.00, SD = 0.00) scored significantly higher (p = .018), than RPNs in the 20-29 years (M = 2.00, SD = 0.00) age category. Additionally, RPNs 40-49 years (M = 3.00, SD = 0.00) scored significantly higher (p = .009), than RPNs who were 20-29 years (M = 1.67, SD = 0.58) on the item the "Nurse will withdraw from conflict" [F(2, 60) = 4.42, p = .02]. For the subdomain Communication, RPNs 40-49 years (M = 3.75, SD = 0.50) scored significantly higher (p = .019), than RPNs who were in the 30-39 years (M = 2.88, SD = 0.35) on the item "It's easy to ask for advice from nurses on this unit" [F(2, 60) = 4.37, p = .02]. Overall, RPNs 40-49 years scored significantly higher than younger RPNs and RNs on most of the items in the professionalism subdomain. The differences related to "Willingness to collaborate with one another"

[F(2, 60) = 5.49, p = .007], clinical competence "Nurses have the technical skills necessary to provide safe care for the patients on this unit" [F(2, 60) = 3.23, p = .047], mutual respect "There is a respectful and cordial relationship among nurses" [F(2, 60) = 5.46, p = .007], and leadership "On this unit nurses leadership support collaborations" [F(2, 60) = 5.30, p = .008]. There were no significant interactions found between the subdomains and levels of nursing education, years of experience or gender.

Table 1. Participant demographics (n = 65)

Variable	Category	Percentage	N
Type of nurse	• RN	77	50
	• RPN	23	15
Gender - RN	• Male	11	7
	• Female	67	43
Gender - RPN	• Male	2	1
	• Female	22	14
Age - RN	• 20-29 years	34	22
	• 30-39 years	11	7
	• 40-49 years	22	14
	• 50-59 years	6	4
	• > 60 years	5	3
Age - RPN	• 20-29 years	5	3
	• 30-39 years	12	8
	• 40-49 years	6	4
	• 50-59 years	0	0
	• > 60 years	0	0
Level of nursing education - RN	• Diploma (equivalent to associate degree)	28	18
	• Baccalaureate	48	31
	• Master's degree	2	1
	• Doctoral degree	0	0
Level of nursing education - RPN	• Certificate	5	3
	• Diploma	15	10
	• Baccalaureate	3	2
Years working as an RN	• < 1 years	6	4
	• 1-5 years	23	15
	• 6-12 years	15	10
	• 13-20 years	17	11
	• > 20 years	15	10
Years working as an RPN	• < 1 years	5	3
	• 1-5 years	5	3
	• 6-12 years	10	6
	• 13-20 years	3	2
	• > 20 years	2	1
Clinical practice setting - RN	• Medical unit	23	15
	• Surgical unit	5	3
	• Emergency department	49	32
Clinical practice setting - RPN	• Medical unit	10	6
	• Surgical unit	3	2
	• Emergency department	11	7

Table 2. Nurse-nurse collaboration scale characteristics of study participants by combined sub-domains

Subdomain	Mean (*SD*)	Nurse (*SD*)	Clinical Setting (*SD*)	Age (*SD*)	Gender (*SD*)	Years Experience (*SD*)	Education Level (*SD*)
Conflict management	M = 2.71 (0.30)	RPN = 2.69 (0.31) RN = 2.71 (0.30)	M = 2.71 (0.27) S = 2.66 (0.16) ED = 2.71 (0.33)	20-29 = 2.74 (0.32) 30-39 = 2.70 (0.23) 40-49 = 2.70 (0.31) 50-59 = 2.79 (0.43) 60 ≤ 2.43 (0.14)	M = 2.71 (0.25) F = 2.71 (0.31)	< 1 = 2.84 (0.34) 1-5 = 2.75 (0.31) 6-12 = 2.68 (0.23) 13-20 = 2.74 (0.33) 20 ≤ 2.56 (0.28)	C = 2.81 (0.16) D = 2.63 (0.34) B = 2.76 (0.27) M =2.86 (-)
F score		.076	.078	.773	.003	1.212	1.206
p-value		.783	.925	.547	.955	.315	.315
Communication	M = 2.87 (0.30)	RPN = 2.81 (0.26) RN = 2.89 (0.31)	M = 2.86 (0.20) S = 2.68 (0.36) ED = 2.91 (0.33)	20-29 = 2.95 (0.26) 30-39 = 2.76 (0.23) 40-49 = 2.95 (0.37) 50-59 = 2.66 (0.16) 60 ≤ 2.65 (0.33)	M = 2.88 (0.34) F = 2.87 (0.30)	< 1 = 2.77 (0.39) 1-5 = 3.03 (0.17) 6-12 = 2.770 (0.22) 13-20 = 2.80 (0.25) 20 ≤ 2.93 (0.45)	C = 2.79 (0.14) D = 2.83 (0.29) B = 2.91 (0.33) M = 3.00 (-)
F score		0.918	1.368	2.531	0.000	2.374	0.488
p-value		.342	.262	.050	.994	.062	.692
Shared Processes	M = 3.07 (0.33)	RPN = 3.14 (0.39) RN = 3.05 (0.31)	M = 3.03 (0.33) S = 3.00 (0.15) ED = 3.11 (0.35)	20-29 = 3.07 (0.25) 30-39 = 3.03 (0.28) 40-49 = 3.13 (0.46) 50-59 = 3.19 (0.33) 60 ≤ 2.89 (0.32)	M = 2.94 (0.48) F = 3.09 (0.31)	< 1 = 3.02 (0.30) 1-5 = 3.15 (0.24) 6-12 = 2.98 (0.28) 13-20 = 3.01 (0.52) 20 ≤ 3.19 (0.26)	C = 3.13 (0.57) D = 3.04 (0.35) B = 3.10 (0.30) M = 3.00 (-)
F score		0.801	0.570	0.534	1.570	1.021	0.174
p-value		.374	.569	.711	.215	.404	.914
Coordination	M = 2.92 (0.48)	RPN = 3.01 (0.53) RN = 2.89 (0.46)	M = 3.04 (0.50) S = 2.92 (0.23) ED = 2.85 (0.48)	20-29 = 2.84 (0.38) 30-39 = 2.80 (0.26) 40-49 = 3.11 (0.55) 50-59= 3.15 (0.74) 60 ≤ 2.73 (1.00)	M = 2.88 (0.48) F = 2.92 (0.48)	< 1 = 2.80 (0.50) 1-5 = 2.94 (0.36) 6-12 = 2.73 (0.27) 13-20 = 3.04 (0.55) 20 ≤ 3.07 (0.71)	C = 3.20 (0.72) D = 2.86 (0.55) B = 2.94 (0.40) M = 2.80 (-)
F score		0.774	1.087	1.523	0.073	1.254	0.513
p-value		.382	.344	.207	.788	.298	.675
Professionalism	M = 3.25 (0.40)	RPN = 3.31 (0.48) RN = 3.23 (0.38)	M = 3.19 (0.35) S = 3.14 (0.48) ED = 3.29 (0.42)	20-29 = 3.22 (0.44) 30-39 = 3.13 (0.26) 40-49 = 3.40 (0.42) 50-59=3.19 (0.17) 60 ≤ 3.25 (0.40)	M = 3.32 (0.37) F = 3.24 (0.41)	<1 = 3.43 (0.52) 1-5 = 3.16 (0.37) 6-12 = 3.16 (0.37) 13-20 = 3.21 (0.37) 20 ≤ 3.44 (0.43)	C = 3.71 (0.49) D = 3.22 (0.39) B = 3.24 (0.40) M = 3.00 (-)
F score		0.543	0.590	0.976	0.310	1.49	1.570
p-value		.464	.557	.427	.580	.217	.206

4.2 Qualitative findings

Findings from the interviews revealed that RNs and RPNs generally believed they collaborated well on each of the three clinical units. They described their collaboration as working as a team and making decisions for the purpose of providing quality patient care. Two main themes emerged from the analysis of ten participants' descriptive responses: *"What exactly is my role?"* and *"Age: Does it really make a difference?"* Pseudonyms were applied to all quotations.

4.2.1 *What exactly is my role?*

A predominant factor that encouraged collaboration among RNs and RPNs was related to understanding the nurse's scope of practice. Working to full scope was viewed by both RNs and RPNs as having the full range of knowledge and clinical skills required to effectively and efficiently care for the patient population on the unit. Both RNs and RPNs said working to full scope was important when collaborating with each other:

"Yes, scope of practice. . . is a good thing [for collaboration] in our department. . . the RPNs are good and skilled. . . and you don't need to keep an eye on their care. . . they know. . . what they know and don't know. . . and they come to me if they don't know something. . . most having been working forever. . . ." (Debbie, RN)

"The goal is that if I am collaborating with someone. . . who understands. . . .and allows me to work to my full scope. . . .this is better for patient care, the patient experience." (David, RPN)

Several emergency department RNs and RPNs said a hospital tool, the "Canadian Triage and Acuity Scale (CTAS)"[34] assisted nurses with working to their full scope, thus contributing to successful collaboration. The CTAS helps with

identifying emergency department patients' needs, establishing and implementing appropriate treatment, investigation and disposition.[33] There are five CTAS levels with level 1 representing the sickest patients and level 5 the least ill group of patients. One RN said:

"We use the CTAS scale for all of our emergency patients and this establishes which patients the RPNs can independently take care of... in urgent care... or admitted patients... they generally are not too sick... the CTAS helps us [the RNs and RPNs] work as a team...." (Stella, RN)

Possessing communication and coordination skills was identified as a requirement of working to full scope of practice, and a facilitator of collaboration. The importance of communication and coordinator skills was viewed differently across the clinical units and was based on patient care and unit needs. Bernie, an RN working in the emergency department said:

"This place is so busy... there are so many factors impacting my time... so I need to know that [RPNs] know their roles... and they [RPNs] know when to come to me with something outside their scope....they immediately tell me if a patient has become unstable or critical... that's how we collaborate."

While nurses in the emergency department said good communication skills were highly valued, the nurses working on the medical unit said coordination skills were important factors relating to scope of practice and collaboration. An RN said:

"Someone has to know what is going on on the floor at all times....someone has to know who is coming and going... who is in isolation... who is critical... we are already caring for 5 or 6 patients... we can't know everything....so overseeing all of this lands on the charge nurse....they have to determine the assignment... and make sure there are the right nurses [RN or RPN] who can handle the situation."

Alternatively, a lack of willingness by some nurses to work to their full scope of practice was seen as a barrier to successful collaboration among RNs and RPNs. Carol, an RPN said:

"We have RNs who won't even work charge because they are not comfortable with it. I have no idea how they get away with it as it is an expectation of their role... there is tension....when [RNs] are not working to their full scope... and they make a heavier workload for the rest of the team."

Nurses not working to their full scope contributed to role ambiguity among RNs and RPNs. Several of the nurses said that they were unsure of each other's scope of practice/practice boundaries and this discouraged their collaboration. Stella, an RN said:

"There aren't any exact rules... no documentation with what the RPNs are allowed to do in comparison to the RNs in our department... it's all kind of vague... have to play it by ear... it can be confusing... "

The lack of role clarity was of particularly a concern for RPNs who believed that some RNs did not understand their scope of practice, and this negatively affected their collaboration:

"Some of the RNs need to have a much clearer understanding of the scope of practice of RPNs, and between RNs and RPNs and if they understood this better... probably collaboration would be better. I still find the RN and RPN roles to have some confusion in terms of 'can I do that'? or 'can you do that?" (David, RPN)

"If they [RNs] understand our scope of practice, it is a huge help... some don't know our scope... we were taught in school about scope for RNs and RPNs, but not sure if RNs as they seem to not always know our scope... there is some tension on occasion... some believe we don't belong on certain units... but the RPN program has changed a lot... and it looks a lot like the [RN] college programs." (Robert, RPN)

4.2.2 *Age: Does it really make a difference?*

The second theme related to a factor that discouraged collaboration among the nurses: the age of the nurse. Many of the nurses said that older RNs and RPNs discouraged collaboration for several reasons including poor interactional and interpersonal relationship skills, and a perceived lack of clinical knowledge. One RPN stated:

"The new, younger RNs are better at this [collaborating] than older ones... they are generally more open to collaborating with RPNs... more experienced nurses can be more difficult." (David, RPN)

Some RNs and RPNs also noted that the interpersonal skills of some of the nurses were a problem and contributed to poor collaboration.

"I noticed the senior RPNs who have worked forever had a strong personality that, as a new nurse... kind of belittled my skill... my role... they were not helpful... I did not want to work with [them]." (Debbie, RN)

"I definitely think... we have some older nurses both RNs and RPNs who won't collaborate with others. They do their own stuff... they mostly take care of themselves. It definitely shows when people are not willing to collaborate with others....it shows in their attitude and how they act... they look down on RPNs... they make you uncomfortable." (Carol, RPN)

Several RNs and RPNs believed that collaboration was dis-

couraged by older nurses who they viewed as lacking knowledge of their patient's condition and certain procedures:

"I will definitely not ask some senior RNs for help... a lot of them lack basic knowledge about their patients condition or about actual care... they have not expanded their scope so much so that the younger RPNs look more knowledgeable. I have had a couple of older senior RNs that cannot be relied on... so I go outside my team to find help or more often go to the charge nurse ... with questions. You learn to go to the nurses you can count on." (Carol, RPN)

"Yes, we have older ones [RPNs] who refuse to do it [work to their full scope]... they did not have to do what the younger ones are doing now....like IVs, NGs... you know they don't want to change... and no one really forces them to do so... we usually trade things off... like I will do your IV if you do my blood sugars... but it does create animosity in relation to workload." (Tina, RN)

5. DISCUSSION

This mixed methods study provides some new understanding of collaboration among RNs and RPNs in acute care. While collaboration among healthcare providers has received considerable attention, little empirical study has addressed how intraprofessional collaboration is enacted and manifested in clinical practice. Moreover, few studies have examined collaboration among RNs and RPNs in acute care settings, where RPNs have not typically worked. The study is unique as it examined nurse-nurse collaboration across three clinical units, thus the findings may be relevant to a broad range of settings where RNs and RPNs are employed.

The overall findings highlight collaboration as a complex interactional and relational process that is better understood using a combination of quantitative and qualitative methods. The quantitative analysis showed that RN-RPN collaboration was influenced by both patient population and the clinical practice environment. This finding was supported by the qualitative interviews that suggested collaboration was enacted differently on each of the three clinical practice settings. For example, emergency department nurses reported the importance of accurate communication when collaborating with each other. This is not surprising given the demands of the emergency department and its unpredictable and fast paced environment where information is shared quickly by nurses. This reinforces what has been previously reported in the literature, that effective, accurate communication is a key interactional component required for successful collaboration.[35] Similarly, nurses on the medical unit said that coordinating care was important to collaboration. Coordination involves following routines, policies, procedures and protocols that assist with organizing patient care. Not surprising, nurses on the medical unit identified coordination as an important factor when collaborating given the care needs of a generally more stable population of admitted patients and a predictable practice setting.[36,37]

Although not explained by the quantitative data, a strong theme from the qualitative data was the importance of RNs and RPNs working to their full scope of practice as a facilitator of collaboration. Working to a full scope of nursing practice involves the utilization of theoretical knowledge through the application of critical thinking and clinical skills,[38] and the nurses in the study viewed working to full scope as encouraging collaborative practice. In contrast, nurses not working to their full scope of practice, or unwilling to work to full scope was perceived by nurses to contribute to role ambiguity and confusion and this discouraged collaboration. This finding is consistent with previous research that shows substantial role confusion continues to exist between RNs and RPNs,[39] and is concerning given that role ambiguity is associated with higher turnover rates, increased medical errors, and increased role conflict.[40] Baranek suggests that role ambiguity leads to workplace tension, lack of mutual trust, diminished professional identity, and poor teamwork; all factors that contribute to ineffective collaboration among nurses.[41]

The findings from the qualitative interviews offered some explanation as to why collaboration scores were lower among younger nurses, and highlight older age as a barrier to successful collaboration. Younger nurses (particularly RNs) consistently reported lower scores across all subdomains of the collaboration survey and this was predominately related to professionalism; the subdomain composed of clinical competence, leadership, mutual respect and willingness to collaborate skills. Qualitative findings supported that younger nurses perceived older RNs and RPNs as having poor interpersonal, interactional and clinical skills, and an unwillingness to collaborate. This resulted in reduced credibility, respect, and trust of older nurses by the younger nurses. While younger nurses viewed older nurses as less collaborative, the findings suggest that this may be due to generational affiliations rather than just age itself. The challenges faced between nurses from different generations have been well documented given the current nursing workforce is composed of three generational cohorts: Baby Boomers, Gen-X, and Gen-Y (Millennials).[42] Different generations have different values, goals, priorities, work ethics, attitudes, expectations, and perceptions of their work and work settings.[43] For example, Sirias, Karp and Brotherton found that Gen-Xers were self-reliant and had a greater preference for working alone than Baby Boomers.[44] Furthermore, a critical review of the

literature showed there is less interest in teamwork with each successive generation.[42]

The findings from this study showed that collaboration was positively and negatively influenced by nurses working or not working to their full scope of practice, role ambiguity, age, and interpersonal and interactional skills. To improve collaboration, educational and organizational strategies should be considered. First, educational institutions should consider providing opportunities for RN and RPN students to be educated together and learn about each other's scope of practice. Moreover, joint RN/RPN education would help nurses obtain the theoretical knowledge and clinical practice skills relating to teamwork, professionalism, conflict management and leadership; important characteristics of successful collaboration.[45]

Healthcare organizations and specifically clinical managers have an important role to play in developing successful collaborative practice environments. While each clinical unit may have its own diverse needs, managers need to ensure there are opportunities for nurses to learn about, build and maintain positive collaborative relationships.[23] This could be accomplished by healthcare organizations providing in-services, lunch and learns, and other educational sessions on collaborative practice and effective team functioning. Given that collaboration is a relational process, managers must also be willing to address nurses with poor interpersonal skills. For example, in our study, some senior nurses refused to work to full scope of practice. This created an increased workload for other nurses that resulted in resentment and poor collaboration. While not an easy task, clinical managers must take action to resolve this type of inequity or risk having morale, recruitment and retention problems among nursing staff.[46,47]

Another strategy healthcare organizations could consider to improve collaboration among nurses is to adopt a collaborative practice model or framework. Using a framework such as the National Interprofessional Competency Framework (NICF) would assist nurses to jointly understand the competencies required to engage in collaborative practice.[48] In its present form, the NICF highlights six competency domains required for successful collaborative practice: role clarification, team functioning, patient/family/community-centered care, collaborative leadership, communication, and conflict resolution. The NICF could be of benefit to guide collaborative practice among nurses and could be modified to reflect key components of individual healthcare organizations. Whether using a collaborative model or framework, some form of ongoing education regarding collaborative practice is needed. This was a strong message from RNs and RPNs in our study. Simply, there were no organizational "rules", guidelines, or documents in place regarding understanding each other's roles, and understanding "how to collaborate". The lack of knowing how collaboration is enacted between nurses is not a new finding, as the authors of this paper have reported this in previous studies.[23,49]

Study limitations

The study contributes to the current limited literature on RN and RPN collaboration in acute care settings. However, there are limitations that must be addressed. The findings reflect the perspectives of staff RNs and RPNs at one organization in one geographic location, and therefore the results may limit transferability to other nursing roles and specialties in other organizations and locations. Despite a systematic and persistent recruitment process, quantitative and qualitative data collection was challenging, and reflected in the response rate. This was likely due to the inherent demands of nurses' work. For example, several nurses agreed to participate in the interview process, but never carried through with the interview due to "working overtime" or "too exhausted" after work.

Overall, this study did shed light on the important factors relating to nurse-nurse collaboration, however, more research (particularly intervention studies) is required to further understand this complex process and how it can be used to improve patient care. Future research should also include a replication of the study across different patient care settings including large tertiary care and small community hospitals, community/home health agencies, and long term care organizations. Lastly, further research should examine the impact on collaboration from multiple generations of both RNs and RPNs.

6. CONCLUSIONS

RNs and RPNs working in medical, surgical and emergency department collaborated for the purpose of providing optimal patient care. Collaborative practice requires nurses to work to their full scope of practice, thus enabling nurses to understand each other's roles and contributions. Collaboration is a voluntary process and therefore nurses must be willing to collaborate and possess positive interpersonal skills no matter what age or generation they represent. To improve collaboration among RNs and RPNs, educational institutions need to provide a joint curriculum that focuses on teamwork and professionalism. Furthermore, healthcare organizations and particularly clinical managers should promote collaborative practice by providing educational initiatives for nurses, and by adopting a collaborative practice model or framework to assist with understanding the competencies needed to suc-

cessfully collaborate. Although this study was conducted in an acute care setting, implications could be extrapolated to other health care settings such as community setting, or to long term care facilities where different levels of nurses must work together to provide safe, quality patient care.

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CONFLICTS OF INTEREST DISCLOSURE

The authors declare they have no conflict of interest.

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