Special Issue: Advanced Practice Nursing

Perceptions of the effectiveness of Advanced Practice Nurses on a neurosurgery unit in a Canadian Tertiary Care Centre: A pre-and-post implementation design

Alanna M. Keenan [a], Erin E. Mutterback [a, *], Kristi M. Velthuizen [b], Monika E. Pantalone [a], Kira L. Gossack-Keenan [c]

[a] The Ottawa Hospital, Ottawa, Ontario, Canada
[b] University of Ottawa, Ottawa, Ontario, Canada
[c] McMaster University, Hamilton, Ontario, Canada

ARTICLE INFO

ABSTRACT

Objectives: A framework for the advanced practice nurse (APN) role was developed in our Canadian Tertiary Care Centre, delineating five domains of advanced nursing practice: clinical practice, consultation, research, education and leadership. The goal of this study was to evaluate perceptions of the effectiveness of the implementation of an innovative APN role on an in-patient Neurosurgery unit.
Methods: A pre-and-post implementation design, incorporating both qualitative and quantitative data, was utilized. An innovative APN role was implemented within the Neurosurgery program focusing on the clinical domain and required the successful candidates to be NP prepared. This APN role was designed to improve patient flow, documentation, communication and patient and staff satisfaction. Three primary outcomes were measured: pre-implementation questionnaire (nurses), post-implementation questionnaire (nurses and residents) and number of pages to the on-call resident.
Results: Survey scores by nurses and residents indicated improvement across all aspects studied. Average scores increased from 1.1 to 2.6, reflecting an overall statistically significant increase. The number of pages to the on-call resident also showed a decrease.
Conclusion: Perceptions of patient care delivery and professional collaboration improved following implementation of the APN role. Responses indicated that APNs significantly impacted patient care and improved nurses and residents' job satisfaction.
© 2018 Chinese Nursing Association. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

1. Introduction

As healthcare needs evolve, in the context of rising costs, an aging population, and associated increases in chronic disease prevalence, so has the presence and demand for Advanced Practice Nurses (APNs) [1]. For over a decade, there has been renewed interest in the APN role by federal and provincial governments as a way to influence changes in Canada's healthcare system [2—4]. Nursing has responded to increasingly complex patient needs and technological innovations with the introduction of more advanced practice roles. These roles have been implemented in all domains of health care, including acute care [5].

The title Advanced Practice Nurse is an umbrella term describing an advanced level of nursing practice. Only two of these roles are currently recognized in Canada: the clinical nurse specialist (CNS) and the nurse practitioner (NP). According to the Canadian Nurses Association, APNs use critical thinking to guide their practice, employing theoretical and empirical explanations to "… enhance the provision of timely, accessible, cost-effective and quality healthcare for all Canadians" [6]. The APN role in the Canadian healthcare system has become increasingly important, as APNs play a vital role in contributing to a sustainable and effective health care system. Although there are underlying differences, both the NP and CNS significantly contribute to healthcare and positive patient outcomes through evidence-based practice [7,8]. APNs are Master's prepared nurses whose primary focus is clinical; however, they also

* Corresponding author. The Ottawa Hospital — General Campus, 501 Smyth Road, Ottawa, Ontario, K1H 8L6, Canada.
E-mail address: emutterback@toh.ca (E.E. Mutterback).
Peer review under responsibility of Chinese Nursing Association.

provide expertise in research, leadership and collaboration/consultation [9].

Numerous studies have demonstrated the benefits of enacting the APN role. Enhanced patient care, reduced length of stay (LOS) and financial savings were cited by Collins et al. [10], while improvement in timely care and patient and staff satisfaction were demonstrated by Johnson [11]. Fry's literature review [12] found a reduction in patient complication, morbidity and mortality rates, in addition to positive financial outcomes with reduced intensive care unit LOS, hospital LOS and readmission rates. Kleinpell [13] reported that the use of APNs in the acute care setting shortened LOS, reduced readmission rates, and lowered rates of urinary tract infections (UTI), pneumonia and skin breakdown among patients. Despite the benefits of the APN role, some uncertainty around the nature of their role still remains, necessitating ongoing study and clarification of their function [14].

Over the past few years, several studies have emerged from the US, Canada and UK which have recommended the creation of new provider models in response to restrictions in surgical residents' work-hours and changing health care environments, especially for acute care units where more intensive monitoring is needed [15–17]. Kahn et al. in their 2015 study [16] on the impact of advanced practice providers found that "teaching hospitals often employ advanced practice providers (APP), including nurse practitioners and physician assistants to counteract residents' work-hour restrictions" (p 8). In addition, they found that residents' perceptions were improved regarding workload, teaching protocols, patient care and communication. Previous studies show that collaboration between physicians and nurses can optimize patient care and decrease wait times [18,19].

Following the merger of three tertiary care hospitals in Ottawa, Canada, a task force was established to identify a framework for the role of the Advanced Practice Nurse. This advanced role at The Ottawa Hospital (TOH) was designed to improve outcomes for complex patient populations through advanced nursing practice in the four competencies identified by the Canadian Nursing Association: clinical, collaboration/consultation, research, and leadership. In addition, TOH highlighted education as a separate component, for a total of five domains [20]. The APN Task Force determined that both CNS and NPs would fall under the title APN, regardless of differing educational preparation. This allowed for flexibility within individual programs to determine which APN competency would be the prioritized focus of practice. A standardized tool was developed and utilized for clinical programs to evaluate the need for an APN within specific programs [20]. One of the areas identifying a need for an APN was the neurosurgery program, where high volumes, acuity of patients and the relative lack of neurosurgery residents contributed to ongoing challenges to the delivery of services.

Nursing staff felt these challenges had resulted in a number of patient-care issues: delays in the response to clinical questions about patient's care; gaps in documentation in the interdisciplinary progress notes, delays in the writing of treatment orders and consultations to the multi-disciplinary team and other specialists. These inefficiencies in patient flow resulted in perceptions of decreased patient and staff satisfaction. The goal of introducing clinical APN roles was to provide continuity of patient-focused care through an APN model. This would allow for continual advanced clinical expertise on the unit, would expand collaborative practice with the nursing staff and would effectively respond to individual patient care needs. The introduction of a new APN role was an important initiative to address the previously identified gaps.

The purpose of this study was to evaluate the impact and perceptions of nursing staff and neurosurgery residents following the implementation of two NP-prepared APN positions on an in-patient neurosurgery unit at a Canadian Tertiary Care Centre. Clinical staff's perceptions of the care delivery pre-implementation were compared to the care-delivery model post-implementation. In addition, the number of patient related calls received by the neurosurgery on-call resident was evaluated as a primary outcome of the APN role implementation.

2. Methods

2.1. Study design and intervention

Two NP's were selected to fill these newly implemented APN positions. Responsibilities for these positions focused on the clinical domain and required the successful candidates to be NP prepared. These APNs completed advanced health assessments, ordered and interpreted laboratory tests and diagnostic imaging, ordered medications (with the exception of benzodiazepines and opioids) and discharged patients. The APNs rounded with the neurosurgery residents each morning to review and update patients' treatment plans and to clarify questions regarding patients' conditions. The APNs were present on the unit for eight hours daily on weekdays and were involved in decision-making involving patients' medical care. Additional responsibilities included consulting other medical services, meeting with allied health team members to clarify patients' plan of care, leading family meetings and discharge planning. Their role also focused on continual open communication with all members of the health care team, allowing for the transfer of timely information to nurses and families regarding care plans. The neurosurgery APN role had an 80% clinical and consulting component, with the remaining 20% evenly divided amongst the other three domains: education, research and leadership. The implementation of this APN role within a tertiary setting provided the ideal opportunity to evaluate the perceived impact of the role. The "Participatory, Evidence-based, Patient-focused process, for guidance in the development, implementation and evaluation of advanced practice nursing" (PEPPA framework), which recommends evaluation of progress in achieving pre-determined outcomes based goals, reflects the framework that was utilized to guide this research project [21].

The study utilized a pre-test post-test design to survey staff perceptions of the newly implemented APN role. Given that no standardized measures to assess acute APN roles were available, a study-specific questionnaire was designed by the two neurosurgery APN researchers. Informal consultations with nursing staff had identified gaps in care, inspiring the APN to explore the impact of the role implementation. Relevant questions were formulated, based on the APN's clinical expertise and specific to the acute neurosurgical environment. A third APN, with expertise in a related field assessed the questions and acted as an independent reviewer, analyzing the responses for consistency and validity.

The questionnaire utilized for the survey was primarily quantitative with a qualitative component consisting of open-ended questions. The goal was to derive categories from the qualitative responses, in order to more fully understand the quantitative results. In addition to the questionnaires completed by nursing staff and neurosurgery residents, LOS and resident call logs were examined.

2.2. Study outcomes

The primary outcomes from the study were measured though the pre- and post-implementation questionnaires completed by the staff nurses, the post-questionnaires completed by the residents, and the number of patient related calls the on-call resident

received pre- and post-implementation. In addition, LOS was evaluated as a secondary outcome as there was no direct linear relationship between LOS and the APN role, and many factors other than the APN role could potentially impact the duration of hospital stays. LOS of neurosurgery in-patients over a three-month period pre- and post-APN role implementation was obtained from the hospital's Performance Management department, based on the length of time neurosurgery patients occupied an acute care bed. Although patient satisfaction scores are frequently assessed, it was not possible to separate corporate hospital results for neurosurgery patients as the clinical unit cared for both neurology and neurosurgical patients. The APNs and resident staff involved in the study cared for only neurosurgical patients.

2.3. Study participants

Ethical approval was granted by the Ottawa Health Sciences Network Research Ethics Board. Potential participants received an information sheet attached to each questionnaire. The information sheet specified that implied consent was given by completion of the questionnaire.

Nurses were informed of the study in a staff meeting as well as via email. The email alerted nursing staff that they were invited to participate in a study requesting their perceptions of the current delivery of care. Inclusion criteria for the study included registered nurses (RNs) working full-time and part-time in permanent positions on the in-patient neurosurgery unit. The exclusion criteria was defined as RNs who were in temporary positions and/or had not worked full or part-time on the in-patient neurosurgery unit (i.e. nurses floating to the unit for a shift; nurses on maternity leave; nurses starting work post-implementation of the new APN role). Residents who worked in the neurosurgery program prior to and after the implementation of the new APN role were asked to complete a post-implementation questionnaire. Off-service residents or residents not working on service during the pre- and post-implementation time frames designated for this study were excluded.

A total of 75 nurses caring for the neurosurgery in-patient population created the convenience sample for potential participants in the research study. Eight neurosurgery residents who met inclusion criteria were invited to complete a questionnaire post-implementation. Although residents had not been initially invited to participate in the study, responses of nursing staff to the pre-questionnaire and unsolicited feedback from residents regarding the new APN role persuaded the authors of the importance of adding the residents' perspective, as they were key stakeholders in the role implementation. Neurosurgeons and administrators were not invited to the study as the focus was on day-to-day patient management and the primary impact would be felt by the nurses and residents.

2.4. Data collection

Staff was informed of the dates questionnaires would be available, their location on the unit and who to contact if they had further questions regarding the study. As nurses are a primary component of the daily management of patient care, it was felt their input was vital to evaluate perceptions of the APN role. Copies of the questionnaire (See Appendix A) and information letters were available over a one-month period at the nursing station to remind and encourage the nurses to participate. Responses were returned in a sealed envelope to the nursing station to ensure confidentiality and anonymity. Ten months following the implementation of the new APN role, the questionnaire (see Appendix B) was redistributed to nursing staff of the neurosurgery in-patient units. A

personal leave of one of the two APNs occurred at ten months post implementation. Ten months was judged to be an adequate amount of time for the APNs to become integrated into the new model of care, for staff to incorporate these new roles in their daily approach to patient care and for nurses and residents to develop their perspectives on the impact of this change. While research suggests 12 months as the ideal time marker for comparison [22], the incoming APN was new to the role and was not initially practicing to full scope, which the authors felt would impact perceptions of the roles and responses to the questionnaire. Having staff complete a similar (differed only in the description of the team) questionnaire allowed for direct comparison to elicit the perceptions of the impact of the role implementation.

2.4.1. Questionnaire for nurses

The questionnaire consisted of seven questions related to the previously identified gaps in care delivery. These aspects evaluated the effectiveness of patient care pre- and post-implementation of the APN role and focused on perceptions of the nursing staff. The concepts included:

- oral and written communication between the neurosurgery team and nursing staff
- availability of written plans of patient care
- availability of the residents for clinical questions
- timeliness of coordination of care (consults to multidisciplinary team, community care access and resources)
- delays in patient discharge due to unavailability of the team to complete prescriptions
- facilitation of the delivery of excellent patient care
- facilitation of clinical learning opportunities for nursing staff

Responses were recorded on a Likert scale, from never (0) to always (3). The (0) to (3) scale was selected as (0) reflected most accurately the response of "never" and a 4-point scale forced respondents to select either a positive or negative answer. In addition, space was available following these questions where respondents were invited to add comments elaborating their responses.

2.4.2. Questionnaire for residents

This questionnaire (see Appendix C) focused on perceptions of the new APN role from a neurosurgery resident's perspective. Topics included the perceived impact on: number of patient related calls/interruptions during day-time hours, time management for residents, efficiency of patient care delivery, the delivery of excellent patient care, and neurosurgery residents' overall job satisfaction.

2.4.3. Patient related calls and length of stay

Data was collected over a three-month period pre-implementation and again post-implementation for the same three-month period, one year later. The number of patient related calls received by the on-call resident was provided by the Communications Department. LOS data was provided by the Decision Support department for the same three-month period, pre- and post-implementation.

2.5. Data analysis

2.5.1. Questionnaire: quantitative data

Averages and ranges were calculated using Excel to compare pre- and post-data. The Mann-Whitney U test was used to analyze pre- and post-questionnaire data with SPSS to determine significance based on two-tail testing and P values ≤ 0.05. Since lower scores for questions four and five reflected improvement in care,

response values were reversed in statistical calculations of these questions to evaluate overall improvement (see appendices A and B). Comparative analysis for the number of patient related calls to the on-call resident and LOS was completed using a two-tailed independent samples t-test. For each of these variables, data from the first three months of 2012 was compared to the first three months of 2013.

2.5.2. Questionnaire: qualitative data

Qualitative responses were transcribed verbatim from the questionnaire and inductive content analysis was utilized [23]. Responses were initially reviewed and categorized by a research assistant and subsequently reviewed by the three individual researchers who were involved in the creation of the questionnaire. The categories were verified collaboratively by the researchers and confirmed by consensus.

3. Results

3.1. Study population

A total of 31 of the 75 nurses (41%) completed the pre-implementation questionnaire and 41 (55%) completed the post-implementation questionnaire. Six of the eight eligible neurosurgery residents (80%) completed the questionnaire post-implementation.

3.2. Primary outcomes

3.2.1. Quantitative questionnaire

Questionnaires completed by nursing staff indicated significant increases ($P < 0.001$) across all aspects between the pre- and post-implementation periods (see Table 1). Of a maximum score of three, the overall average pre-implementation score for the seven questions was 0.94, which increased to an average score of 2.31, reflecting an overall increase of 146%. The three aspects demonstrating the most significant increases were: communication between the nursing staff and the APN/medical team; improved communication of the written plan of care; and learning opportunities for the nursing staff.

3.2.2. Qualitative responses

3.2.2.1. Pre-implementation nursing questionnaire. Responses to the open ended questions were limited, with eight comments collected from the pre-implementation questionnaires. Two main categories were identified: issues with availability of the neurosurgery team and issues with communication related to patients and staff. Lack of availability of the neurosurgery team was associated with delays in patient flow, which could negatively impact the patient experience.

"Discharges are either delayed till late in the day or the next day due to residents and senior staff. I find them unaccountable to those they represent".

Issues with communication were also highlighted:

"It is common to be called back only after several times of paging the neurosurgery team. I am looking forward to a better way of communicating with the team."

3.2.2.2. Post-implementation nursing questionnaire. Nurses were much more effusive in their post-implementation comments, with a 212% increase in the number of responses ($n = 25$ as compared to 8 responses in the pre-implementation survey). Comments were grouped into four main categories: enhanced delivery of care (32%), appreciation of the APN role (28%), increased patient and staff satisfaction (20%), and improvement in communication (20%). Staff felt that patient care concerns were effectively addressed by the APNs and as a result, patient flow was improved.

"Having the APNs on the unit has made care more efficient, issues are able to be dealt with in a very timely fashion".

Several of the comments reflected appreciation of the APN role and noted perceived improvement of both staff and patient satisfaction.

"Having the NPs has <u>dramatically</u> improved the work environment. Patients are happy as there is more consistency from day to day".

"Morale is higher and staff are happier and less stressed. This survey doesn't capture the great benefit of having these APN on the unit."

Improved communication was identified as a positive outcome.

"Communication has <u>GREATLY</u> improved since the APNs have started. APNs consistently document in patients' charts and answer patient and family questions. However this is <u>NOT</u> done by the residents."

The six neurosurgery residents who met inclusion criteria strongly agreed that the new APN role had a positive impact on their work life. This included perceived decreases in the number of interruptions during surgeries, improved time management, improvement in the delivery and coordination of excellent patient care and overall increased job satisfaction (see Table 2). For the qualitative component, each resident provided a single brief comment (i.e. "The APNs are great!") regarding their overall perception of the APN role. Their comments reflected a perceived

Table 1
Responses from nursing questionnaire.

	1.Oral Communication	2.Written Plan of Care	3.Staff Availability	4.Coordination of Care	5.Discharge Delays	6.Patient care delivery	7.Learning opportunities
PRE average ($n = 31$)	0.84	0.81	1.00	1.37	1.23	1.00	0.35
POST average ($n = 41$)	2.54	2.46	2.49	2.07	2.34	2.63	1.61
% increase	202%	204%	149%	51%	90%	163%	360%
Mann-Whitney U	28.5	22.5	52.5	266	162	45	110
Z-score	−7.196	−7.284	−6.964	−5.240	−5.924	−6.879	−6.351
Significance, two tailed	$P < 0.001$	$P < 0.001$	$P < 0.001$	$P < 0.001$	$P < 0.001$	$P < 0.001$	$P < 0.001$

Note: 0 = never, 1 = rarely, 2 = often, 3 = always.

Table 2
Resident's questionnaire results (mean scores).

	Decrease in patient related calls	Time Management	Patient care Coordination	Delivery of Patient care	Job Satisfaction
Residents	3.00	3.00	3.00	2.83	3.00

Note: 0 = strongly disagree, 1 = somewhat disagree, 2 = somewhat agree, 3 = strongly agree.

reduced workload while on-call and a positive impact on patient care and the quality of care delivery.

3.2.3. Patient related calls

The number of patient related calls to the on-call resident showed an overall reduction in number (see Table 3). While the total number of overall patient related calls decreased, the percent of day-time patient related calls (during APN working hours) remained relatively stable (20%) over the three-month period. Upon comparison of the pre- and post-implementation number of patient related calls, a significant difference at a P value of 0.031 was noted.

3.3. Secondary outcome

Length of stay

LOS results showed an increase between the pre- and post-APN implementation period (see Table 4), however this difference was not statistically significant.

4. Discussion

Nursing questionnaire results demonstrated very positive perceptions of the implementation of the APN role, from both a quantitative and qualitative perspective. Significant improvements across all aspects identified on the questionnaire were noted and addressed previously identified gaps in care and patient flow. The most significant increases were seen in both written and verbal communication, which is similar to Khan's research [16]. Collins et al. [10] surveyed nursing staff who 100% agreed or strongly agreed that the Acute Care Nurse Practitioners (ACNP) were knowledgeable about the patient's plan of care, experienced in the care of trauma patients, and improved patient care overall. This was reflected in our study, where nurses perceived improvements in the availability of APN staff, decreased delays in discharge planning, enhanced coordination of care and excellent patient care delivery. Opportunities for clinical learning experiences were reported as significantly improved with the introduction of the APN role, which had not been previously identified in the literature.

Not only was patient care perceived to be enhanced, but the qualitative data indicated improvements to the quality of work-life and morale amongst the neurosurgery nursing staff. Johnson [11] also reported benefits in providing timely care and patient and staff satisfaction with the introduction of an oncology nurse practitioner navigator position. Neurosurgery residents also perceived that patients' care was enhanced and that the APN role had a positive impact on their work-life. This finding is supported by Khan's

research [16], which noted a positive impact on resident's perception on workload, patient care and communication.

It had been anticipated that the number of patient related calls to the neurosurgery resident during the day would decrease as a result of having APNs readily available. Although these patient related calls during day-time hours (while APNs were present) did not decrease, the overall number of patient related calls decreased. This may be a result of APNs clarifying patients' plan of care and resolving issues during the day, which decreased the off-hours patient related calls to the resident. It is important to note that the majority of patient related calls received were after-hours, when the APNs were not available.

The secondary outcome measure of LOS for acute in-patients on the neurosurgery unit did not demonstrate improved results. This is in contrast to the study by Collins et al. et [10], where the addition of experienced ACNPs resulted in the decrease of overall trauma service LOS, saving almost $9 million in hospital charges. A number of external factors not directly related to the APN role may have influenced this outcome in our study. Health care system constraints (limited OR time, restricted access to sub-acute beds) may have prolonged LOS. In addition, many of the patients on a neurosurgery unit are elderly and have multiple co-morbidities, which may have resulted in complications and extended hospital stays [24].

Some limitations of this study were the relatively small sample size and the fact that recruitment occurred at a single site. Results may not be generalizable to a broader population or transferable to another department. This study comparison was completed early in the inception of this new APN role, which may have had an impact on study outcomes. The nursing staff was adjusting to the new role and at times required clarification regarding the scope of the APN practice. Researchers have identified challenges in the implementation of APN roles due to lack of role clarity [14]. It is important to note that the knowledge of the staff evolved over the study period, as the nurses became more familiar with how the APN role functioned. Another limitation was that the study focused on direct clinical practice and did not evaluate the impact on other domains of the APN role. Given the positive results concerning increased learning opportunities for nursing staff, research focused on the educational and leadership domains could demonstrate valuable support for the APN role.

5. Conclusion

The goal of introducing clinically focused APN roles was to provide continuity of patient-focused care through an APN model, thus allowing for continual advanced clinical expertise on the unit,

Table 3
Resident call logs.

Number of patient related calls	January	February	March	Total
Pre-implementation 2012 (day calls/night calls)	1458 (242/1216)	1313 (272/1041)	1419 (197/1222)	4190 (711/3479)
Post-implementation 2013 (day calls/night calls)	1171 (223/948)	1282 (282/1000)	1207 (208/999)	3660 (713/2947)
Reduction in total calls	20%	2%	15%	13%
Test statistic Degrees of freedom	$t = 3.2550$; $df = 4$			
Significance when comparing Jan–Mar 2012 to Jan–Mar 2013 calls	$P = 0.031$			

Table 4
Length of stay results.

LOS - days	January	February	March	Average
2012	10.2	7.8	7.8	8.6
2013	10.1	9.2	9.6	9.6
Test statistic Degrees of freedom	$t = -1.2283$; $df = 4$			
Significance when comparing Jan—March 2012 to 2013	$P = 0.287$			

collaborative practice with the nursing staff and effective management of individual patient care needs. Implementation of the APN role resulted in very positive perceptions of communication between the nursing staff and the APN/medical team; improved communication of the written plan of care; and learning opportunities for the nursing staff. Given the extremely positive perceptions of the APN role in this acute care neurosurgery setting, it is important that nursing research continue to produce evidence related to specific successes and influences of the APN role. As noted by Hurlock-Chorostecki, Forchuk, Orchard, Soeren, Reeves [25], research focused on role enactment is needed to understand the uniqueness of the hospital-based advanced practice nursing role. Replicating this study in the future to evaluate the impact and sustainability of the role once well established and recognized by leadership is recommended.

Appendices. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.ijnss.2018.03.008.

References

[1] Bryant-Lukosius D, DiCenso A. A Framework for the Introduction And Evaluation Of Advanced Practice Nursing Roles. 2004. p. 530—40. 48(5).
[2] Gould O, Johnstone D, Wasylkiw L. Nurse practitioners in Canada: beginnings, benefits, and barriers. J Am Acad Nurse Pract 2007;19(4):165—71.
[3] Hutchinson B, Abelson J, Lewis J. Primary care in Canada: so much innovation, so little changes. Health Aff 2001;20(3):116—31.
[4] Lewis SA. Thousand points of Light? Moving forward in primary health care. Primary health care. Winnipeg, MB: A Framework That Fits; 2004.
[5] Duffield C, Gardner G, Chang A, Catling-Paull C. Advanced nursing practice: a global perspective. Collegian 2009;16:55—62.
[6] Canadian Nurses Association. Position statement: Advanced nursing practice. Retrieved from: https://www.cna-aiic.ca/~/media/cna/page-content/pdf-en/ps60_advanced_nursing_practice_2007_e.pdf?la=en; 2007.
[7] Canadian Nurses Association. Position statement: Clinical nurse specialist. Retrieved from, www.cna-aiic.ca/~/media/cna/page-content/pdf-en/clinical-nurse-specialist_position-statement.pdf?la=en; 2009a.
[8] Canadian Nurses Association. Position statement: The nurse practitioner. Retrieved from, www.cna-aiic.ca/~/media/cna/page-content/pdf-en/ps_nurse_practitioner_e.pdf?la=en; 2009b.
[9] Canadian Nurses Association. Advanced Nursing Practice : A National Framework. Retrieved from, www.cna-aiic.ca/~/media/cna/page-content/pdf-en/anp_national_framework_e.pdf; 2008.
[10] Collins N, Miller R, Kapu A, Martin R, Morton M, Forrester M, et al. Outcomes of addingacute care nurse practitioners to a Level I trauma service with the goal of decreased length of stay and improved physician and nursing satisfaction. J Trauma Acute Care Surg 2014;76(2):353—7.
[11] Johnson F. Systematic review of oncology nurse practitioner navigation metrics. Clin J Oncol Nurs 2015;19(3):308—13.
[12] Fry M. Literature review of the impact of nurse practitioners in critical care services. Nurs Crit Care 2011;16(2):58.
[13] Kleinpell R. APNs: invisible champions? Nurs Manag 2007;38(5):18—22.
[14] Lowe G, Plummer V, O'Brien A, Boyd L. Time To Clarify — The Value Of Advanced Practice Nursing Roles In Health Care. Jan 2012. p. 677—85. 68(3).
[15] Edkins R, Cairns B, Hultman C. A systematic review of advance practice providers in acute care: options for a new model in a burn intensive care unit. Ann Plast Surg 2014;72(3):285—8.
[16] Kahn S, Davis S, Banes C, Dennis B, May A, Gunter O. Impact of advanced practice providers (nurse practitioners and physician assistants) on surgical residents' critical care experience. J Surg Res 2015;199(1):7—12.
[17] McDonnell A, Goodwin E, Kennedy F, Hawley K, Gerrish K, Smith C. An Evaluation Of The Implementation Of Advanced Nurse Practitioner (Anp) Roles In An Acute Hospital Setting. Jan 2015. p. 789—99. 71(4).
[18] Donnelly G. Clinical expertise in advanced nursing: a Canadian perspective. Nurse Educ Today 2003;23:168—73.
[19] Trypuc J, Hudson A. Waiting lists and nursing. Nurs Leader 2005;18(4):36.
[20] De Grasse C, Nicklin W. Advanced nursing practice: old hat, new design. Clin J Nurs Leadersh 2001;14(4):7—12.
[21] APN Data Collection Toolkit: PEPPA Framework Retrieved from: http://apntoolkit.mcmaster.ca/index.php?option=com_content&view=article&id=244&Itemid=29 : 2918.
[22] Bryant-Lukosius D, Spichiger E, Martin J, Stoll H, Kellerhals SD, Fliedner M, et al. Framework for evaluating the impact of advanced practice nursing roles. J Nurs Scholarsh 2016;48(2):201—9.
[23] Elo S, Kyngash H. The Qualitative Content Analysis Process. Jan 2007. p. 107—15. 62(1).
[24] The Ottawa hospital. Trauma annual report 2013-2014. 2014.
[25] Hurlock-Chorostecki C, Forchuk C, Orchard C, Soeren M, Reeves S. Hospital-based nurse practitioner roles and interprofessional practice: a scoping review. Nurs Health Sci 2014;16(3):403—10.