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An exploratory intervention to expand the horizon for Japanese neonatal nurses: Acquisition and retention of knowledge and skills related to nursing practice

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ABSTRACT

The traditional role of the Japanese Neonatal Nurse differs in comparison to that of western colleagues'. However the Japanese philosophy of attention to care that epitomizes neonatal care reflects the exquisite and delicate nature of the Japanese culture. Japanese neonatal nurses who wish to expand their clinical roles, however, face a number of challenges. These challenges result from a combination of the non-existence of any relevant training to prepare a clinically advanced nurse in Japan, and the historic and legal background, which has led to the current scope of practice. The historic background is reported in depth elsewhere (Konishi 2016). An interventional study that includes both didactic and skills lab was designed to explore the feasibility of introducing an educational program and its effectiveness in a Japanese setting. The results demonstrated that a neonatal specific educational program offers the potential to prepare highly educated and motivated neonatal nurses with a capacity to perform in a role with an extended scope of practice. As a result of this interventional study, participants were found to experience changes in their role perceptions, as well as differences in their interactions with colleagues.

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Introduction

Globally, neonatal nurses are performing a range of invasive procedures that are essential to care for infants in neonatal intensive care units (NICUs). There are significant variations across different countries, in regards to the range of procedural skills that are allowed to be performed by neonatal nurses, or what scope of practice is delineated for neonatal nurses in each country. The insertion of peripheral venous lines, collecting blood specimens from venous punctures or heel sticks are commonly taught to first year neonatal nurses during their initial training period. These invasive procedures are generally viewed as fundamental nursing skills in the NICUs worldwide (W. Eklund, 2010; W Eklund and Kenner, 2015).

Japanese Neonatal Nurses have traditionally practiced a role that does not include the performance of invasive skills preferring to identify their role as 'supportive' to the physicians. A lack of educational programs for neonatal nurses in Japan was identified and an educational framework aimed at expanding the role of neonatal nurses to enable them to enhanced their scope of practice in both procedural skills and clinical judgement was explored. The issues of legal and historic influences, which have guided and shaped Japanese neonatal nursing have been examined previously (Konishi, 2016).

The authors conducted an interventional study that included neonatal specific discussions among the participants, workshops to address complex neonatal clinical scenarios/cases, and a skills lab to practice some invasive procedures. The purpose of this study was to firstly develop an educational program to equip competent neonatal nurses with an enhanced knowledge base and the practical skills to safely carry out basic invasive procedures. The second objective was to assess the effectiveness of the program by measuring acquisition and retention of knowledge and skills and to examine the participants' sense of satisfaction and perceptions towards their new role and how the role affected their relationships with colleagues. This study was approved by Tokyo Women's Medical University Institutional Review Board (2748).

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Methods

The participants

All nurses from the 96 hospitals affiliated to educational institutions in metropolitan areas of Japan were invited to participate. The researchers discussed the proposal with the nurse managers at each of the NICUs and familiarized them with the study design. Nurses who responded to the invitation were screened for eligibility. The inclusion criteria specified that the participants had worked in an NICU for more than two years. Nurses who had received additional midwifery education, graduated as Certified Nurse Specialists (CNSs), a two year graduate program similar to the US clinical nurse specialists, or Certified in Neonatal Intensive Care (CNs), a six months education program from Japan Nursing Association (JNA) were excluded. Although there are no neonatal specific CNS programs in Japan, pediatric CNS programs exist. Some of these pediatrics CNS graduates are found working in NICU environment and we needed to avoid recruiting any with higher degrees for this particular study. Our focus was to explore the benefit of providing enhanced education to staff nurses without further educational qualifications in a role similar to global counterparts.

Study design

This study was a non-randomized interventional study. The participants were assigned to one of two groups, an intervention group or a control group, ensuring that individuals from the same institutions did not cluster into one group.

Interventions

The education arm of the study consisted of a five day program as illustrated in Table 1. The program was offered to the participating group on every alternate Saturday from September to November 2011. Seven hours of lectures were included on various neonatal topics, two sessions for team-based learning with an opportunity to reflect on the lectures (1 h each), two sessions of problem-based learning (1.5 h each) to discuss complex care of infants born with trisomy 18, and two three hour sessions in the skills lab. All the participants were trained in two basic nursing skills during the lab sessions; heel stick and peripheral intravenous line (PIV) insertion. These two procedures are routine practice in Japanese nursing, however, not in neonatal and pediatric specialties. A premature infant simulator for the skill lab was developed (Fig. 1), as an actual practice on babies receiving care in the neonatal unit was possible. The control group was provided with handouts on the same theoretical topics, however, no interventional educational sessions were offered.

Data collection

Demographic characteristics

The demographic characteristics were collected using a questionnaire. These included age, number of years qualified as a nurse in Japan and as a neonatal nurse, highest level of education attained and whether or not they held the NCPR certificate. All the participants were recruited from the NICUs, which are affiliated with Regional Perinatal Centers, equivalent to level III or acute regional referral centers.

Neonatal knowledge assessment

The knowledge assessment included 50 multiple-choice questions. Each question offered four or five multiple-choice options with participants selecting the one best answer/response. Each correctly answered item was worth one point. The primary author, an experienced neonatal nurse constructed all the questions and the questions were then reviewed by a second member of the research team with extensive neonatal experience. This individual is also a respected expert in higher education specific to medical education and well versed in neonatal disease, pathology and physiology. There is no advance practice neonatal nursing role in Japan currently, therefore, it was necessary to seek the opinion of medical education experts to examine the content of the questions.

The multiple-choice questions were carefully constructed to represent more complex and advanced level of neonatal knowledge, relevant to nurses working in NICUs. To ensure that the difficulty levels are appropriate for this interventional study, the researchers referenced NICU certification review questions available in the United States and also a question and answer booklet made available to support neonatal residents in Japan.

The skill performance: heel stick and PIV

Skill acquisition included two tasks for all the participants in the intervention group; collection of a blood sample by a heel

Table 1
A schedule of the educational program.

Day		Neonatal topic	Time
1th	Pre-test	Knowledge assessment	30 min
		Skills assessment	7 min
		Questionnaire	
	Lecture 1	Cardiovascular system, Pulmonary system, Metabolic and Endocrine system	1 hr each topic
	Lecture 2	Neonatal physical assessment	
	Lecture 3	Interpretation of laboratory findings and XR images	
2nd	Lecture 4	Common neonatal diseases: diagnosis and management	1 hr each topic
	Lecture 5	Neonatal pharmacology	
	Lecture 6	Neonatal fluid and electrolytes	
	Lecture 7	Medical management and role of nurses	
	Team-based learning 1	Review of lecture 1 to 3	1 hr each topic
	Team-based learning 2	Review of lecture 4 to 6	
3rd	Problem-based leaning 1	Care of an infant with Sx suggestive of trisomy 18 (Admission to NICU: initial care)	1.5 hrs
	Simulation-based leaning 1	Heel stick and PIV	3 hrs
4th	Problem-based leaning 2	Care of an infant with Sx suggestive of trisomy 18 (Discharge Preparation 2 weeks after admission)	1.5 hrs
	Simulation-based leaning 2	Heel stick and PIV	3 hrs
5th	Post-test	Knowledge assessment	30 min
		Skill assessment	7 min
		Questionnaire	

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