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Using the Delphi Technique to Develop Standards for Neonatal Intensive Care Nursing Education

ABSTRACT

The purpose of this study was to use the Delphi technique to determine the first draft of national standards for neonatal intensive care nursing (NICN) education. The Australian College of Neonatal Nurses (ACNN) endorsed the project, and assisted in the selection of members for a panel of 13 neonatal intensive care nursing and education experts from all states of Australia that conducted NICN education programs. These experts were consulted over a period of seven months using the Delphi technique. The researcher initially developed a set of questions to guide the expert panel.

Over a series of three iterations and using a consensus level of 75% agreement, most standards were agreed to. Areas addressed were program requirements, prerequisite requirements, program leadership, theoretical program structure and content, clinical education program structure and content and educator support. Subsequent work will finalise the standards for publication and subsequent use by NICN educators and clinicians across Australia.

(Throughout this paper the terms ‘neonatal intensive care nursing’ and ‘neonatal nursing’ are used. The use of the word ‘nursing’ in these phrases refers to the provision of care to the infant in the NICU. Both nurses and midwives provide this care.)

What is known about this topic and what this paper adds

What is known about this topic:

Neonatal intensive care nursing is a highly specialised field of nursing, and requires exceptionally skilled and well educated neonatal nurses who are appropriately prepared to care for their vulnerable patients and families. The use of nursing education standards ensures the quality of education programs and their nursing graduates. In Australia, nursing education standards have been developed for undergraduate nursing programs, but not for postgraduate programs, such as neonatal intensive care nursing courses (NICNC). There is no consistency across Australia regarding NICNC curricula, and the Australian College of Neonatal Nurses could play a lead role in the establishment of such guidelines. The Delphi technique can be used to reach consensus level opinions amongst experts.

What this paper adds:

This research defines the first set of standards for neonatal intensive care nursing education in Australia, developed by an expert panel of neonatal clinicians and educators from all States. It demonstrates that the Delphi technique is well suited to this type of research, providing a mean whereby busy professionals can contribute meaningfully to significant projects affecting their discipline.

Using the Delphi Technique to Develop Standards

for Neonatal Intensive Care Nursing Education

INTRODUCTION

Nurses and midwives need quality education to equip them to enable them to practice in the highly technical and challenging environment of the neonatal intensive care unit (NICU), caring for critically ill infants and their families. Although neonatal intensive care nursing as a specialty has developed significantly nationally and internationally over the last 40 years, there is no consistency to education of these nurses/midwives across Australia.

After an initial orientation program, the pathway for most nurses and midwives who wish to make neonatal nursing a career is the completion of a formal neonatal intensive care nursing education course (Neonatal Intensive Care Nursing Course [NICNC]) to equip them with the skills and knowledge to provide care for this vulnerable patient cohort. Around Australia, neonatal intensive care nursing education courses are offered as stand-alone Hospital Certificates, in the tertiary sector as part of the requirements for a Graduate Diploma, Graduate Certificate and Masters of Nursing, as well as Hospital Certificates offering credit towards a Graduate Certificate.

Local programs are subject to annual evaluations and three yearly major curriculum reviews, with benchmarking being conducted against similar programs nationally. Graduate outcomes have been largely dependent on local institutional requirements. Although locally determined graduate outcomes are met, there are no national guidelines that have set minimum standards for levels of award, integration of clinical and academic competence, prerequisite requirements, length, theoretical content, contact time and graduate outcomes in neonatal

nursing education programs. Consequently nurses/midwives completing NICN courses have varying knowledge and skills.

Anecdotally, neonatal nurses are subject to a review of their credentials and skills when they arrive in a new NICU and must undergo competency testing before their qualifications are fully recognised. National standards in neonatal intensive care nursing education would facilitate the transferability of qualifications across Australia. Without requesting information from each Course Coordinator individually across Australia, it is impossible to identify course content. This lack of transparency makes it difficult for prospective students to make informed decisions about providers.

Nationally consistent, high quality education standards for neonatal intensive care nursing education would ensure that neonates, their families and the public's expectations that nurses/midwives are appropriately qualified and experienced to care for sick and preterm neonates are met. A set of national neonatal intensive care nursing education standards would provide a benchmark for the Australian College of Neonatal Nurses (ACNN) to better promote excellence in practice, the professionalism of neonatal nurses, and shape health policies and decision-making in this area of expertise.

Study Aims

This research study aimed to use the Delphi technique to develop the first draft of national neonatal intensive care nursing education standards to achieve consistency in the curriculum structure and implementation of neonatal intensive care nursing (NICN) education programs across Australia. Additionally, the study was intended as an exploration of the theoretical and

methodological basis of the Delphi technique, and its utility in establishing agreed educational standards.

Literature Review

The Current Situation: Standards of Neonatal Nursing Education

Currently, there are no published standards for education of neonatal intensive care nurses internationally or nationally. Closely related, however, are the education standards for Neonatal Nurse Practitioner programs developed by the National Association of Neonatal Nurses (NANN) in America, that define the minimum standards necessary for educating a Neonatal Nurse Practitioner (NNP) [1].

Many post-registration programs in specialty areas of practice (such as critical care) are offered by universities and as such must meet the university's requirements for a qualification within the Australian Qualifications Framework [2]. In addition, most courses take into account standards and competencies developed by the various nursing and midwifery colleges and specialty interest groups when framing their course outcomes. Professional associations are usually the first to recognise the need to standardise the provision of education to its members, and they are generally the leaders in the process. Midwives have been leaders in the development of national standards for education and the Australian College of Midwives (ACM) have published national standards for accreditation of the three-year Bachelor of Midwifery programs that lead to initial registration as a midwife in Australia [3]. Pincombe, Thorogood and Kitschke believe that the standards provide a means for "employers and clinicians to access a standardised and objective means to evaluate midwifery programs" [4]. The Australian College of Critical Care Nurses (ACCCN) published a position statement on the provision of critical care nursing education [5]. Their recommendations included a focus on

the level of program that critical care nurses should undertake to prepare them for the role, the need for broad graduate outcomes, the support students need in the clinical setting, the need for recognition of prior learning, broad content areas of critical care education programs and improving access to programs [5]. Although the ACCCN has now developed a role in reviewing curricula for resuscitation programs, they have not developed specific standards for critical care education in Australia.

Methodology: The Delphi Technique

Hasson, Keeney and McKenna [6] describe the Delphi technique as a group facilitation technique: an iterative multi-stage process, designed to transform opinion into group consensus. The technique employs a panel of experts who answer a series of questionnaires, or respond to data sets without physically assembling. This facilitates the inclusion of individuals from a wide variety of locations.

Each round of questioning is followed with the feedback on the preceding round of replies, usually presented anonymously. As a result of receiving the group's opinions, the experts are encouraged to revise their earlier answers in light of the replies of other members of the group. During this process the range of answers should decrease and the group should converge towards consensus.

Martino [7] has conducted over 40 reviews of Delphi studies, and suggests that there are few hard rules for implementing the technique, but it typically has three distinguishing characteristics, the first of which is *iteration with controlled feedback*, where experts are surveyed multiple times. Iteration enables group learning and allows opinions to change with this learning. Rounds are reiterated as long as desired or necessary to achieve stability in the

results. The second feature is *anonymity*. Participants remain anonymous to each other, avoiding influence by reputation, authority or affiliation, and this enables them to change their opinions without losing face. The last feature is a *statistical representation of the group's response,* where responses are summarised statistically. Often panel members whose opinions fall in the bottom or top extremes (quartiles) are asked to give the group further justification, as in this study, where panel members whose responses were >75% variant from the mode scores of other panel members were given an opportunity to either revise them or explain their opinion further.

Whilst these three features are consistent with the Delphi approach, over the years modifications have occurred to the Delphi technique to suit the type of research being undertaken. In this study, an initial set of questions was developed by the researcher and circulated for comment to the panel as a starting point, rather than the panel writing the first draft of the standards. This modification has been utilised by many authors [8-13] where the process begins with a set of carefully developed items. This modification typically improves the initial round response rate, provides a solid grounding in previously developed work, as well as reduces the number of rounds by one.

The questions in this study were used to elicit experts' opinions about the content of future standards in neonatal intensive care nursing education. The questions were divided into categories, namely program requirements including prerequisite requirements for student entry, program leadership and support for learning, curriculum content, both theoretical and clinical, educational resources, graduate outcomes, clinical sites and learning opportunities.

Literature findings, the author's experience as a neonatal nursing educator and the standards from other like professions were utilised as a starting point. The professional standards consulted were the:

- Australian College of Critical Care Nurses (2002) 2nd Ed. *Competency Standards for Specialist Critical Care Nurses* [14]
- Australian College of Critical Care Nurses (2006) *ACCCN Position Statement on the Provision of Critical Care Nursing Education* [5]
- Australian Nursing and Midwifery Council (2006) *Code of Ethics for Nurses and Midwives.* [15]
- National Health Ministers Advisory Council (2006) *National Nursing and Nursing Education Taskforce* (N^3ET), *Final Report*. [16]
- New South Wales Nurses' Association (2003) *Policy on Nurse Education*. [17]
- nurses board of south australia (2006) Standards For Approval of Education Courses.[18]
- Nurses Association of New Brunswick (2005) *Standards for Nursing Education in New Brunswick*, Vancouver,[19] and the
- The Australian College of Midwives (2006) *Standards for the Accreditation of Bachelor of Midwifery Education Programs Leading to Initial Registration as a Midwife in Australia*.[3]

The Likert scale was used in Rounds Two and Three when participants were asked to make a choice regarding their agreement or disagreement with statements provided by panel members in response to the questions in Round One, with responses varying from 1. 'strongly disagree' through to 5. 'strongly agree'. The first round questionnaire was piloted with a

group of four nurse educators who were not involved in the study and whose area of expertise was not neonatal (i.e. midwifery and paediatric).

Sampling Method: Selection of the Expert Panel

The selection of the sample of 'experts' involves non-probability sampling methods, in this case; purposive sampling [6]. In this study the researcher presented the research proposal to the ACNN Executive at their meeting in March 2007, and they agreed to support the study. Once ethics approval was obtained, ACNN Executive were asked to suggest panel members to invite to join the study. Sixteen panel members were sought in total - two educator representatives each from New South Wales, Western Australia and Victoria, where more than one neonatal intensive care course exists; one from Tasmania, Queensland, South Australia and Australian Capital Territory, which host one neonatal intensive care course each; and one senior nurse clinician from each of the states (Victoria, New South Wales, Queensland, Tasmania, Western Australia and South Australia). To guide the ACNN in choosing panel members, the following pre-requisite criteria for panel members were utilised:

- possessed a neonatal intensive care nursing qualification
- had access to email on a regular basis (i.e. almost daily)
- was computer literate, and
- had at least five years experience teaching neonatal intensive care nursing in the case of the educators, or
- had at least five years experience at a senior level in a clinical role in a Neonatal Intensive Care Unit in the case of the senior clinicians.

If invitees agreed to be involved, they were asked to contact the researcher. Fifteen of the 16 initial invitees contacted the researcher, and those 15 formed the expert panel. Of those 15,

two did not return the consent form or respond to the first round of the study, so the panel eventually consisted of 13 representatives from the six states that offered NIC education programs; ten educators and three senior clinicians, including one Neonatal Nurse Practitioner. The educators were a mix of neonatal intensive care nursing course coordinators (n=6) and clinical educators (n=4); some employed by universities and some by tertiary health centres (see acknowledgements).

Conducting the Study:

Ethical Considerations

Ethical approval was obtained from the Social and Behavioural Research Ethics Committee of Flinders University, Adelaide, Australia. Once the nominees were approached by the ACNN executive to ask if they were interested in being involved in the study, they contacted the researcher to confirm their participation. At this point, they were provided with an information sheet, which outlined the study procedures, research technique, and references to further reading. They were then given an opportunity to ask any questions related to the study, and invited to sign the consent form. The panel members understood that their voluntary participation in the study also included the ability to withdraw from the study at any time, and if requested, all information provided by them would be destroyed. On-going consent was assumed on the basis of the return of completed questionnaires. Participants were assured of the confidentiality of the information they provided and that their anonymity would be ensured during the study. The participants agreed that their personal information would be able to be revealed once the Delphi rounds were complete.

Round One: The First Questionnaire

The Round One questionnaire was emailed to the 13 participants as soon as the consent form was received. This questionnaire also requested demographic information. Participants were given one month to complete the first questionnaire. As soon as responses were returned, data analysis and preparation of the next round commenced.

Round Two: The Second Questionnaire

The content of this questionnaire was formulated from the responses to the first. The participants' responses were all transcribed verbatim from Round One into the single Round Two document, and participants were then asked to score their agreement to each response using a Likert scale from 1-5. The second questionnaire was then distributed to the 13 participants who had returned consent forms, even though three of these did not respond to Round One. Their lack of response to Round One could have been because it was time-consuming to complete (they were asked to indicate their level of agreement to 315 items), yet Round Two required only a score. With one month to complete the survey, the response to this round was 66%.

Round Three: The Third and Final Questionnaire

In this round the panel members whose scores were more than two quartiles variant from the mode of the rest of the panel received their score from the previous round in one column, and alongside it, the mode score of the rest of the panel. The percentage of agreement was also included. This provided each panel member with the opportunity to compare their responses with those of other members. They were invited to change their score or respond with further comments if they wished to, in light of their own personal further consideration, or the opinions of the panel. With one month to complete the survey, the response rate to this round was 86%. Table 1 is an example of one of the third round responses.

Data Analysis

Responses from Round One were collated into the Round Two questionnaire. The constant comparative method of data analysis was used to examine the data [21]. Comments were transcribed initially verbatim into one document to keep the full meaning and intent of the argument intact, until eventually no new ideas appeared. At this point new content was summarised as long as the full meaning of the original statement was retained. This process leads to a level of data saturation that is said to add to the reliability of the data [22]. Minority opinions and voices of dissent must be heard in the Delphi process so it is imperative that all comments are noted.

Ascertaining the level of collective opinion entailed the use of descriptive and non-parametric statistics. For example, Round Two required the data from the ratings of the items to be analysed by producing statistical summaries for each item. Central tendencies (means, medians and mode), levels of dispersion (standard deviation and the inter-quartile range) and the percentage of agreement were computed to provide information about collected opinion.

Setting the Level of Consensus

The level of consensus to be employed must be determined prior to commencing data collection. Unfortunately, a universally agreed consensus level does not exist for the Delphi, as the level used depends upon sample numbers, aim of the research and resources. Cyphert and Grant [in 23] considered the use of the mode score rather than the median score as a more appropriate measure of consensus. At the time this was considered a novel approach, and since then the mode score has again been considered a more relevant measure of consensus. McCutcheon [24] considered the use of the mode score as representing 75% of participant responses in her study of nurses' intuition. She argued that the mean score and the median

score were not truly representative of the consensus model, whereas the mode score allowed the most frequently chosen response, however small or large, to be acknowledged and accepted [24]. In this study the degree of consensus required was set at 75% in order to strengthen the outcomes of the study.

Results:

Overall Participation and Return Rates

Of the 16 expert panel members (11 Nurse Educators and four clinicians) originally invited by the ACNN Executive to participate in the study, 15 contacted the researcher and formed the expert panel. Thirteen panel members (ten educators and three senior clinicians) contributed to the study, and 11 (eight educators and three clinicians) completed all rounds. One educator (see * in Table 2) did not complete the questionnaire appropriately, giving only one answer for each bank of responses. Although the response was returned to her and an explanation given about the correct way to proceed, and a phone call to follow up, she did not return the questionnaire at all after that point. Despite intense follow-up and contact made with another educator (designated with this symbol ⌖ in Table 2) who completed about one third of the Round Two questionnaire, she was not able to respond further due to illness. Round One consisted of eight main stem areas of questioning, with 65 questions in all. In Round Two there were 315 items for comment and/or score.

Table 3 summarises the agreement results of the Delphi rounds. It demonstrates that between Rounds Two and Three, panel members increased their agreement rates from n=171 (12 + 126 + 33) to n=209 (14 + 161 + 34): a significant shift towards consensus.

Figure 1 depicts the number of questions sent back to the panel members in Round Three whose score was more than two quartiles from the panel mode, and the number of changes panel members made after viewing the results of the whole panel. The number of responses where panel members were given the chance to change their score ranged between participants from 12-72 items, and on the whole panel members were reluctant to change from their original score.

Presentation of Data: Specific Responses to the Delphi Questions

The purpose of the neonatal intensive care nursing education standards is to ensure that graduates of neonatal intensive care nursing education programs are prepared for safe and effective neonatal nursing practice. Additionally the standards will provide criteria for the development, evaluation and improvement of new and established neonatal intensive care nursing education programs.

The panel reached agreement on most of the elements of the structure and content of the standards, and these results are presented in Appendix 1. To summarise, the panel agreed to the following standards regarding:

- *program requirements* i.e. that neonatal intensive care courses across Australia be offered over a 12-month period as a tertiary award with generic theoretical and clinical aims and outcomes. The curriculum should be reviewed every two to three years, and the program reviewed annually, by a stakeholder group. Academic records should be kept for ten years. The ACNN Competency Standards [25] should be used to guide the clinical component of each course.
- *prerequisite requirements* i.e. that potential NICN course applicants should be registered as a Nurse or Midwife with a minimum of one year's post registration

experience, and experience in a NICU or Special Care Baby Unit (SCBU) in the previous 12 months prior to commencing the NICN course. Of those 12 months, ideally applicants should have 4-6 months pre-course experience in a NICU. During the program of study, they should work in a NICU at least 0.5 FTE.

- *program leadership* i.e. that the Course Coordinator must have a tertiary degree in nursing or midwifery and be working towards or completed a Masters or PhD. He/she should have a Graduate Certificate or Diploma in Neonatal Intensive Care Nursing, and a qualification in education, or be working towards one.
- *the clinical education program structure and content* i.e. that a Clinical Educator must be employed full time to support the students during the program. Specific clinical learning outcomes and specified skills must be attained to ensure the quality of graduates.

Limitations of the Study

The participant selection process may have been affected by selection bias, as it was conducted by a small group of leaders in neonatal nursing who belonged to the ACNN executive. By ensuring that each state had two representatives it was hoped that this would be overcome. Given the criteria suggested for selection of the panel members, it is possible that their opinions may not reflect those of all neonatal nursing educators around the country. The findings may therefore be taken as the beginning of the development of a national consensus on the content of neonatal nursing education programs, rather than the final prescription for the design of curricula. Providing an opportunity for all neonatal nurses/midwives to respond to the draft set of standards through the ACNN will ensure that the final set of standards is nationally representative of opinion.

Discussion

These responses will form the basis for the ACNN neonatal intensive care course education standards and will set the minimum requirements for neonatal intensive care nursing education programs in Australia. Once the standards are completed and published, they can be used to facilitate a nationally consistent approach to quality neonatal intensive care nursing education, and credits and experience accumulated during any NICNC in Australia will be able to be recognised, transferred and portable nationally. Additionally the standards will provide criteria for the development, evaluation and improvement of new and established neonatal intensive care nursing education programs, and allow the ACNN, as the professional body for neonatal nurses in Australia, to better promote excellence in practice and shape health policies in their area of expertise.

The Delphi method was well suited to this research study in that it facilitated the development of a consensus document by a group of experts who could not easily meet in person. Neonatal intensive care nursing is a small sub-specialty in Australia, and geographical and logistical issues create difficulties when seeking the expert advice from its members. Overall the Delphi technique provided a mechanism to capture, sort and distil diverse opinions of neonatal nursing and education experts across Australia to produce an important document that can ultimately impact positively on the outcomes of babies in neonatal intensive care units.

The emergence of midwifery as a separate discipline from nursing [27] and the feedback from midwives who are passionate about their profession has lead the researcher to consider that the nomenclature of 'neonatal intensive care *nursing* course' warrants amendment. In the last five years in South Australia, there have been an increasing number of Registered Nurses applying for neonatal intensive care courses; however

Registered Midwives have always been well represented. The title of the course does not acknowledge the midwives who may wish to undertake this program, and in fact direct entry midwives with no nursing qualifications may feel excluded by the title. The researcher acknowledges this fact, and on resumption of the Delphi rounds, will ask for this issue to be considered.

Whilst panel members may agree in this study on the items to be included in the standards, implementation may not be straightforward. The reality of clinical practice may be far from the ideal, as local conditions impose barriers to execution of the standards. Each individual NICN program will need to establish their own level of compliance according to their particular local conditions. Conformity with the standards cannot be compulsory, but may provide a lever for states to improve their programs. The utilitarian nature of the framework for this study accepts this reality, as the end result of adoption of the standards has the capacity to improve the nursing care of thousands of vulnerable neonatal patients, the working lives of hundreds of neonatal nurses/midwives, and the job satisfaction of the 40 or so neonatal nursing/midwifery educators in Australia.

Recommendations

The following recommendations are made as a result of this study:

1. that the Australian College of Neonatal Nurses adopt the education standards for neonatal intensive care nursing education.
2. that providers of neonatal intensive care nursing education across Australia consider incorporation of the standards for neonatal intensive care nursing education into their neonatal intensive care nursing education programs.

3. that the researcher and Delphi panel members work together over the next 12 months to establish graduate outcomes for neonatal intensive care course graduates.
4. that the Australian College of Neonatal Nurses conduct a formal review of the use of the standards for neonatal intensive care nursing education in 3-5 years of their inception.

Acknowledgements

The researcher would like to acknowledge and thank the following members of the Delphi panel for their time, expertise, considered and considerable work in the development of these standards. The table indicates the panel members' roles and places of employment at the time of the study:

Julie Bernardo	NNP	Flinders Medical Centre, South Australia
Sharon Downes	Neonatal Nursing Educator	Royal Children's Hospital, Melbourne, Victoria
Melissah Burnett	Neonatal Courses Coordinator	La Trobe University, Melbourne, Victoria
Karen Hose	Clinical Nurse Consultant	Department of Neonatology, Royal Brisbane Women's Hospital, Queensland
Cheryl Norris	Neonatal Courses Coordinator	Royal Hobart Hospital, Tasmania
Kim Psaila	Clinical Educator	Liverpool Newborn Care, New South Wales
Meshall Curtis	Neonatal Nursing Educator	Nurse Educator, Neonatology Division, Q
Rob Hull	Neonatal Courses Coordinator	Flinders Medical Centre, South Australia
Jane Davey	Neonatal Courses Coordinator	College of Nursing, New South Wales
Linda McKean	Neonatal Courses Coordinator	King Edward Memorial Hospital, Western Australia
Emma-Lee Anderton	Clinical Educator	King Edward Memorial Hospital, Western Australia
Helen Patterson	Clinical Nurse Educator VET sector	Royal Women's Hospital, Carlton, Victoria

APPENDIX 1

STANDARD STATEMENTS

The standards follow in bold type font and the rationale, background information and panel responses follow.

1. Program Requirements

A. Neonatal intensive care nursing education courses should be offered as a tertiary award; i.e. graduate certificate.

In Round Two the panel had an 83% agreement level that the course should be offered as a tertiary award. By Round Three, the panel was in 100% agreement.

Arguments put forward by panel members that supported tertiary bases programs included:

- Consistency across states would facilitate the transfer of qualifications from one institution to another, optimise the recruitment of neonatal nurses/midwives and rationalise the workforce.
- A hospital certificate may not have the same national and international credibility as a tertiary award.
- A hospital certificate is subject to local institutional variations in quality.
- Tertiary education offers the infrastructure of a large organisation whose specialty is education, enabling access to teaching and learning resources that may not be available at the hospital level, for example more extensive library and computer resources.
- Teaching staff may have broader expertise and be able to offer a wider curriculum.
- Even though a hospital certificate may have tertiary credit, this may not always guarantee the seamless granting of status into another award as a tertiary qualification would do.
- Tertiary centres might be seen to offer a higher level of academic rigor.
- Established links to masters programs provide a career pathway for neonatal nurses/midwives to a Nurse Practitioner level.
- The Course Coordinator based in a tertiary setting may lack credibility if they do not have direct access to, and involvement in, the clinical environment.

Arguments put forward by panel members that supported hospital-based programs included:

- One of the major advantages of the hospital program compared to a tertiary award is its cost; hospital programs can be offered at low or even no cost
- Entry procedures in hospital courses are often much simpler than the enrollment procedures in a tertiary award.
- Because the Nursing Unit Head of the NICU usually has to support each participant's application in a hospital based course to ensure staffing levels are maintained, the criteria used to judge students' applications for the program have more of an emphasis on clinical readiness that those used to accept students for a tertiary award, reducing the degree of student stress and subsequent attrition during the course.
- The hospital setting can lend clinical credibility to the course, whereas a tertiary-based program may not have the capacity to ensure the same strong clinical links.
- A program in a hospital stimulates others within the neonatal intensive care unit to continue their own learning and maintain their knowledge and skills, and provides role models for future recruits.
- Locally based programs have more flexibility to manage workforce issues than tertiary-based courses. For example a study day organised in a hospital can be cancelled or reduced in hours when clinical demands are high. Students can attend lectures over the Christmas break rather than having to adhere to tertiary semester dates, which may not be suit the occupancy demands of the clinical unit.
- It may not be feasible for tertiary centres to run programs such as neonatal intensive care nursing with such small numbers, yet the NICU can only release a small number of staff for a study day.

B. Neonatal intensive care nursing education courses should be of 12 months duration.

The panel participants believed unanimously that the NICN course should be of 12 months duration. This opinion received 100% support throughout both rounds of the study.

C. Neonatal intensive care nursing education courses curricula should be reviewed every two to three years.

By Round Three, 83% of panel members agreed that NICN education course curricula should be reviewed every two to three years by the stakeholder group, "….as NICU nursing care and even some of the basic understandings change frequently and rapidly" (Participant 4).

D. The following stakeholders should be involved in overall course implementation and planning:

- **Neonatal nurse educators**
- **Expert neonatal nurse clinicians**
- **Nursing Unit Managers**
- **Tertiary representatives**
- **Heads of neonatal departments (nursing and medical)**
- **Industry partners i.e. hospitals with NICUs where students complete clinical experience.**
- **Student representative, and an**
- **Australian Nursing Federation (Union) representative.**

Representatives from nurse licensing authorities and VET and Australian Quality Training Framework (AQTF) sectors were excluded by consensus from the course review process.

E. Neonatal intensive care nursing education programs should be evaluated annually.

Most panel members (91%; n=11) agreed that programs should be evaluated annually. There was complete agreement that the course participants should evaluate each course, and the

program should be continually evaluated with regular peer and student review of all learning and teaching practices, with evaluation at the completion of each unit/module of the course and at the end of the course.

F. There should be a process of continuous quality review of NICN programs.

All panel members (100%; n=12) agreed that with this statement.

G. The Code of Ethics for Nurses [15] should be included in the curriculum documents.

All panel members (100%; n=12) agreed that with this statement.

H. Records of student demographic data, dates of the course, hours of experience in the varying clinical areas, lecture topics, assessment marks, competency achievement, course components, theoretical hours and performance appraisal should be recorded on an academic transcript and kept electronically for 10 years.

Most panel members (91.7%; n=11) agreed with this statement. The purpose of keeping this data would be to assess trends and to potentially provide government health departments with the information to enable an understanding of recruitment/ retention/ education issues. This reputable record of the student's educational and clinical experiences can also be used as evidence of competence and achievement when applying for employment elsewhere, as well as a record to assist with the application of status for recognised prior learning.

I. Generic and broad aims and outcomes should be included in the course guidelines, reflecting the end point that needs to be achieved to be a competent NICNC graduate.

Most panel members (91.7%; n=11) agreed with this statement. The result would create a consistent understanding of the characteristics of a "…generically capable neonatal graduate who could assimilate into any neonatal unit (with appropriate orientation and support) and be capable of a higher level of neonatal nurse function. From these generic aims and outcomes each course would be able to adapt those aims and outcomes to meet specific facility needs" (Participant 4). This work is yet to be undertaken, and this aspect of the standards will require further exploration by the researcher and panel members.

J. The ACNN Competency Standards [25] should be used to guide consistent educational outcomes.

The ACNN Competency Standards [25] are nationally accepted as the neonatal nurse competencies expected of nurses/midwives working in that specialty, and most panel members (91.7%; n=11) agreed should be used nationally to guide consistent educational outcomes.

II. Prerequisite Requirements

A. Potential NICN course applicants should be registered as a Nurse or Midwife with a minimum of one year's post registration experience.

Whilst 91% (n=11) agreed with this statement, however there was considerable variation in other opinions. Figure 2 summarises the options discussed in Round Two.

B. Students should have experience in a NICU or Special Care Baby Unit (SCBU) in the previous 12 months prior to commencing the NICN course. Of those 12 months, ideally applicants should have 4-6 months pre-course experience in a NICU.

Most participants agreed that students should have experience in a NICU (75%; n=10) or SCBU (91%; n=11) or either NICU or SCBU in the previous 12 months prior to commencing the NICN course. Five participants agreed that the students should have experience in a nursing or midwifery area, but scored either NICUs or SCBUs highly as well. By the end of Round Three, 75% of panel members agreed that experience could be undertaken in a SCBU.

Whilst most (83.3%; n=10) agreed that applicants should have four to six months experience in the NICU prior to commencing the course, there was a wide variation in responses, from "no experience necessary" (33.3%; n=4) to 12 months experience required (66.7%; n=8). Twelve months experience was thought to provide "a decent grounding into the nature of neonatal working environments and specific neonatal idiosyncrasies" (Participant 3) and allow recruits to familiarise themselves with the complex equipment in the NICU. Pragmatists considered the shortages of NIC trained nurses/midwives in recommending that prerequisite experience was unnecessary, and not mandatory.

C. Full time employment in a NICU prior to entering the program should be recommended, but not required.

Few panel members [25% (n=3)] agreed or strongly agreed that potential students should work full time prior to starting the course; 66.7% (n=8) believed that three days a week would be adequate, and 83.3% (n=10) agreed that flexibility was important rather than a mandatory requirement to work full time. The participants recognised the requirement to

strike a balance between the need for exposure to the clinical setting that builds confidence and competence, but also the need to provide a flexible family-friendly roster. In a stressful environment like a NICU, many nurses/midwives prefer to work part time. “With the current shortages of NIC trained nurses/midwives, facilitating flexible working hours encourages all age groups to the profession” (Participant 7).

D. A student should be either sponsored to work or be employed within a tertiary neonatal unit for the duration of the course.

There was 100% agreement from the panel with this statement.

III. Program Leadership

A. The Course Coordinator must have a tertiary degree in nursing or midwifery and be working towards or completed a Masters or PhD. He/she should have a Graduate Certificate or Diploma in Neonatal Intensive Care Nursing, and a qualification in education, or be working towards one.

All panel members agreed with Participant 9, that as an educator, “fundamental educational knowledge concerned with micro-teaching skills, curriculum development, assessment, learning styles as well as how to develop and evaluate lessons plans and student learning was required”.

B. The Course Coordinator should have five years post-registration experience to equip them appropriately for the role. He/she should have three-four years of experience as a qualified neonatal nurse before taking on the role. He/she should

have previous experience in teaching in the clinical area, either as a clinical educator or in a mentoring role.

In terms of experience, most respondents (91.7%; n=11) agreed with the first statement, and 100% of panel members agreed with the second part of the statement.

C. The Course Coordinator should be clinically competent, however whilst clinical competence is important, the role is one of course facilitation, not clinical education.

All panel members strongly agreed (100%; n=11) with this statement. Issues of respect and credibility were cited as reasons, as well as the belief that "the clinically competent Course Coordinator with evidence of current skills and knowledge would gain the confidence of the participants and provide a role model for the students" (Participant 2). In addition, the NICU world was seen as constantly adapting to advances in technology, clinical practice and management and an evolving patient population, and the Course Coordinator needed to be up to date with these influences. All panel members agreed however, that the emphasis on the role was course facilitation, not clinical education.

D. The Course Coordinator should undertake regular patient care shifts, facilitated by either clinical placement leave provided by the tertiary facility on a basis of a sabbatical period yearly / six monthly or allow for a workload which supports a clinical shift once or twice a month.

Ten (83.3%) panel members agreed to this statement.

E. The students should have access to a full time clinical educator. The Clinical Educator should have a degree in nursing or midwifery, a neonatal intensive

care nursing qualification, and two years post graduate experience. He/she should be working towards a postgraduate qualification such as a Masters in Nursing. He/she should have, or be pursuing, training in clinical education; this might be a Graduate Certificate in Adult Education, or a TAFE qualification such as a Certificate 4 in Workplace Training and Assessment.

All panel members agreed with the first statement. Nine respondents (75%) believed that he/she should be working towards a postgraduate qualification such as a Masters in Nursing or Midwifery. Most panel members (91.7%; n=11) agreed that he/she should have, or be pursuing, training in clinical education such as a Graduate Certificate in Adult Education, or a Department of Further Education, Employment, Science and Technology (TAFE) qualification such as a Certificate 4 in Workplace Training and Assessment.

F. The Clinical Educator should have five years or more post graduate nursing experience, with two years of neonatal nursing experience since obtaining a NICN qualification, and relevant experience in education/mentoring.

All (100%) of respondents (n=12) agreed with this statement.

NB At this point in the survey, one of the panel members failed to continue her response. Consequently the percentage of agreement shifted to account for 11 panel members rather than 12 from this point forward.

G. The Clinical Educator must be clinically competent. He/she should maintain their clinical expertise by working at the bedside with the students, participating in policy development and revision, providing in-service education to other staff on the ward, attendance at conferences and

seminars, participation in relevant committees and groups and taking a "patient load" once or twice a month.

All panel members agreed with Participant 5, who responded that the Clinical Educator must be clinically competent:

> "Most definitely yes! To teach or support learning in others, educators must be expert themselves. Clinical credibility is of the utmost importance or the worth of the information conveyed to students becomes devalued by them and others."
>
> Participant 5

H. Students should be supported by one to two mentors or preceptors who are able to dedicate time to each of them on a one-on-one basis. Preceptors / mentors must be allowed time to give and receive feedback with students, and time with tertiary academics to discuss student progress.

By the end of Round 3, 81% of the panel agreed that students should be supported by one to two mentors/ preceptors who are able to dedicate time to each of them on a one-on-one basis.

IV. Theoretical Program Structure and Content

A. The neonatal intensive care nursing course should be conducted over a 12-month period, offering at least 200 hours of classroom teaching.

Nine panel members (81.8%) concurred that the neonatal intensive care nursing course should be conducted over a 12-month period, offering at least 200 hours of classroom teaching. A shift from 63.6% to 81.8% agreement occurred on this item between Rounds Two and Three, as Table 4 shows.

B. A variety of educational resources should be utilised in teaching neonatal intensive care nursing. The principles of adult learning should be reflected in the teaching strategies used.

Everyone agreed with the first statement. Examples given by Participant 3 included face-to-face seminars and tutorials, learning packages, on-line and web based material. Most (90.9%; n=10) agreed that the principles of adult learning should be reflected in the teaching strategies used.

C. A variety of assessment techniques should be used to assess the knowledge and competence of the student.

All panel members (100%; n=11) agreed and suggested written and oral examinations, written assignments, case reports and log books as examples.

D. The standards should specify graduate outcomes.

All panel members (100%; n=11) agreed that the standards should prescribe broad graduate outcomes, to enable course coordinators and students to be clear about the standards that they will be expected to achieve. In addition, graduate outcomes would facilitate recruitment and portability of graduate ability nationally and internationally. Most (90.9%; n=10) panel members agreed that the standards should not be absolutely prescriptive about theoretical content, however as Participant 4 explained, “certain content and outcomes need to be agreed upon if the desired end result of a generically capable neonatal nurse is to be achieved – so perhaps an outline of expected content and minimum standards that must be obtained.”

Participant 1 clarifed, “the individual institution should decide the exact content of the course. The course needs flexibility to be able to provide the education suitable to that particular NICU”. The Australian College of Critical Care Nurses in their position statement on the provision of critical care nursing education, provide a list of subject areas that should be included in critical care nursing programs, and include broad areas such as anatomy and physiology, pathophysiology and pharmacology [5]. This aspect of the standards will require further exploration by the researcher and panel members.

V. Clinical Education Program Structure and Content

A. A Level 3 NICU site is the appropriate clinical venue to offer clinical experience for students in a neonatal intensive care nursing education program.

All participants agreed with this statement. The Level 3 NICU should preferably provide the greatest potential for exposure to a large number of infants and a wide variety of conditions. Most (90.9%; n=10) panel members agreed that if the opportunity to practice at this level of care is not possible, as not all NICUs provide all ranges of care, aspects of advanced levels of care must still be covered in the curriculum. If opportunities exist for clinical placements in units (even observational only) that provide this type of care it would be useful. However, acceptance of this “observation” level of exposure contradicts the need for clinical competence in complex skills, and requires further exploration in the standards. This aspect of the standards will require further exploration by the researcher and panel members.

B. The standards should broadly prescribe clinical learning outcomes.

Ninety percent of panel members agreed that the standards should broadly prescribe skills in graduate outcomes if the desired end result of a generically capable neonatal nurse is to be achieved. Participant 4 gave the following statement as an example of a guide to content:

> "At the end of the course the graduate will be able to safely and competently care for ventilated infants with a variety of complex conditions; requiring managements including:
>
> - umbilical or peripheral arterial lines
> - inotropic support
> - total parenteral nutrition
> - family support interventions
> - broad areas such as a anatomy and physiology, pathophysiology and pharmacology".

This aspect of the standards will require further exploration by the researcher and panel members.

C. The students should work a minimum of 0.5 EFT in the NICU for the duration of the program to facilitate the clinical learning experience.

The precedent for nursing standards of education to set theoretical hours has been set in other undergraduate and post-graduate nursing programs. For example, the standards for Neonatal Nurse Practitioner education developed by the National Association of Neonatal Nurses in the USA state that "there must be a minimum of 600 hours of supervised clinical practice in a level 2/3 NICU" to allow students to retain and develop needed skills [1]. Most panel members (81.8%; n=9) agreed with this statement. The 0.5FTE requisite would equate to about 500 hours of clinical experience if students worked at this level for one academic year.

D. Preceptors should have one to two years experience in the NICU since they graduated with a neonatal intensive care nursing qualification.

All panel members (100%; n=11) agreed that students should be supported by all the staff working in the NICU, both medical and nursing, however their primary support people should be the clinical educators, senior staff and preceptors. Most agreed (81.8%; n=9) that preceptors needed one to two years of experience in the NICU since they graduated with a neonatal qualification. Students were seen to be best supported by preceptors with "experience / knowledge / ability and attitude" (Participant 4). All (100%; n=11) respondents agreed that "Preceptors need a neonatal qualification or equivalent, and a welcoming and supportive nature is also essential" (Participant 4).

E. There should be minimum requirements for assessment, both theoretical and clinical. The curriculum guidelines should recommend action to be taken when a student's performance is not acceptable.

All but one respondent (90.9%; n=10) agreed that there should be a minimum requirement for theoretical and clinical assessment. Most panel members (81.8%; n=9) believed that the "standards should recommend a process for students who are failing in clinical practice" (Participant 5). This aspect of the standards will require further exploration by the researcher and panel members.

F. The curriculum should detail the successful competence of specified skills. This should include attendance at a minimum number of high-risk births (if in obstetric setting), a minimum number of resuscitations attended and

managed, successful completion of a minimum number of newborn examinations and gestational age assessments.

In the Australian College of Midwives Standards for Accreditation of Bachelor of Midwifery Education programs [3], specific clinical requirements are recommended, for example students must attend a certain number of antenatal visits and births, and have a placement in a special care baby unit etc. The panel participants were asked if they thought that this would be a useful addition for the ACNN standards i.e. number of resuscitations attended, minimum number of neonatal examinations conducted etc. There was a mixed reaction to this question with 72.7% of the panel (n=8) thinking that is was not necessary as neonatal nurses were not 'accredited to practice' as were midwives, yet 81.8% of members (n=9) agreeing that it would be helpful to have detailed documentation of some skills. This standard will require further work by the researcher and panel to develop the specific requirements.

G. Students should have access to up-to-date evidence based electronic and hard copy resources and references. Web-based library access in the clinical area is also recommended.

All panel members (100%; n=11) believed that students should have the same access to electronic and hard copy resources as any other student in a higher education program.

VI. Educator Support (Course Coordinators and Clinical Educators)

A. Educators need access to an organised staff development program which offers education resources as well as support services.

Nine respondents (81.8%) agreed with this statement.

B. Educators should have individualised job descriptions with specifications regarding their responsibilities, hours, payment, annual leave etc contained therein.

All panel members (100%; n=11) agreed with Participant 12 who suggested this requirement. Educators might be “part-time” to fit in with students or their own work/life balance, but when working in their “education” role, they must be allowed autonomy and scope to do so properly.

REFERENCES

1. National Association of Neonatal Nurses. Education Standards for Neonatal Nurse Practitioner Programs. [Internet]. Illinois, USA: NANN. 2002 [cited 2009 Dec 13]. Available from: http://www.nann.org/pdf/NNP_Standards.pdf

2. Australian Qualifications Framework. Australian Qualifications Framework Implementation Handbook. [Internet]. Carlton, Victoria: AQF. 2007 [cited 2009 Dec 13]. Available from: http://www.aqf.edu.au/AbouttheAQF/TheAQF/tabid/108/Default.aspx

3. Australian College of Midwives (ACM) Standards for the Accreditation of Bachelor of Midwifery Education Programs Leading to Initial Registration as a Midwife in Australia. [Internet]. Canberra, ACT: ACMI. 2006 [cited 2009 Dec 13]. Available from: http://www.midwives.org.au/Portals/8/Documents/standards%20&%20guidelines/ACM_BMid_Standards_April06.pdf

4. Pincombe J, Thorogood C, Kitschke J. The development of National ACMI Standards for the accreditation of three-year Bachelor of Midwifery programs. Aust J Midwifery. 2003 Dec;16(4): 25-30.

5. Australian College of Critical Care Nurses (ACCCN). ACCCN Position Statement on the Provision of Critical Care Nursing Education. Carlton South, Victoria: ACCCN; 2006.

6. Hasson F, Keeney S, McKenna H. Research guidelines for the Delphi survey technique. J Adv Nurs. 2000 32:1008-1015.

7. Martino JP. Technological forecasting for decision making. New York: McGraw-Hill; 1993. in Ettlie JE. Managing Innovation: new technology. Elsevier Butterworth-Heinemann. Oxford, UK; 2006. 101p.

8. Custer RL, Scarcella JA, Stewart BR. The Modified Delphi Technique - A Rotational Modification, Journal of Vocational and Technical Education [Internet]. 1999 [cited 2009 Dec 3];15(2) 6p. Available from: http://scholar.lib.vt.edu/ejournals/JVTE/v15n2/custer.html

9. Alahlafi A, Burge S. What should undergraduate medical students know about psoriasis? Involving patients in curriculum development: modified Delphi technique, British Journal of Medicine. 2005 Mar;330: 633-636.

10. Staggers N, Gassert CA, Curran C. A Delphi Study to Determine Informatics Competencies for Nurses at Four Levels of Practice. Nursing. 2002; 51(6): 383-390.

11. Krause MW, Viljoen MJ, Nel MM, Joubert G. Development of a framework with specific reference to exit-level outcomes for the education and training of South African undergraduate physiotherapy students, Health Policy. 2006 Jun;77(1): 37-42.

12. Nichol H, MacDonald F, Donald L, Edwards L, Gill N, Henderson G, Jones H. The Development of Standards for Diabetes Education in Canada: A

Consensus Building Process, Canadian Journal of Diabetes Care. 1996;20(1): 17-24.

13. Stewart J, O'Halloran C, Harrigan P, Spencer A, Singleton SJ. Identifying appropriate tasks for the preregistration year: modified Delphi technique, British Journal of Medicine, 1999;319:224-229.

14. Australian College of Critical Care Nurses (ACCCN). Competency Standards for Specialist Critical Care Nurses 2nd Ed. Carlton South, Victoria: ACCCN. 2002.

15. Australian Nursing and Midwifery Council. Code of Ethics for Nurses and Midwives. [Internet]. 2006 [cited 2009 Dec 5]. Available from: http://www.anmc.org.au/userfiles/file/research_and_policy/codes_project/New%20Code%20of%20Ethics%20for%20Nurses%20August%202008.pdf

16. National Health Ministers' Advisory Council. National Nursing and Nursing Education Taskforce (N^3ET), Final Report. Melbourne, Victoria: National Health Ministers' Advisory Council; 2006.

17. New South Wales Nurses' Association. Policy on Nurse Education. [Internet]. 2003 [cited 2009 Dec 13]. Available from: http://www.nswnurses.asn.au/infopages/2937.html

18. nurses board of south australia (nbsa). Standards for Approval of Education Courses. [Internet]. 2006 [cited 2009 Dec 10]. Available from:

http://www.nmbsa.sa.gov.au/documents/StandardforApprovalofEducProvidersandEducCourses.pdf

19. Nurses Association of New Brunswick (2005) Standards for Nursing Education in New Brunswick. [Internet]. Vancouver: Nurses Association of New Brunswick; 2005 [cited 2009 Dec 11]. Available from: http://www.nanb.nb.ca/PDF/Approval_of_University_Nursing_Programs_in_New_Brunswick2006.pdf

20. Cohen L, Manion L, Morrison K. Research Methods in Education. 5th ed. London: Routledge Falmer; 2000.

21. Polit DF, Beck CT. Nursing Research. 7th ed. Philadelphia: Lippincott, Williams and Wilkins; 2004.

22. Chenitz WC, Swanson JM. From Practice to Grounded Theory. California: Addison-Wesley; 1986. in Reed D. Grounded Theory and Constant Comparative Analysis. Orthop Nursing. 2004 Nov Dec:23(6):403-404.

23. McGaw B, Browne RK, Rees P. Delphi in Education. Queensland: Teacher Education Policy Study; 1974.

24. McCutcheon H. Nurses' understanding of intuition and perceptions of their use of intuition in nursing practice [Unpublished doctoral thesis]: University of South Australia; 1997.

25. Australian College of Neonatal Nurses (ACNN). Competency Standards of Neonatal Nurses. 2nd ed. Canberra, ACT: ACNN; 2007.

26. Linstone HA, Turoff M (Eds) The Delphi Method: techniques and applications. Massachusetts: Addison-Wesley Publishing Company; 1975. in Waltz CF, Strickland OL. Measurement in Nursing and Health Research. 3rd ed. New York: Springer Publishing Company; 2004. 267 p.

27. Heartfield M. Specialisation and Advanced Practice Discussion Paper. Melbourne, Victoria: National Nursing and Nursing Education Taskforce; 2006.

Table 1 How often should the course curriculum be reviewed?

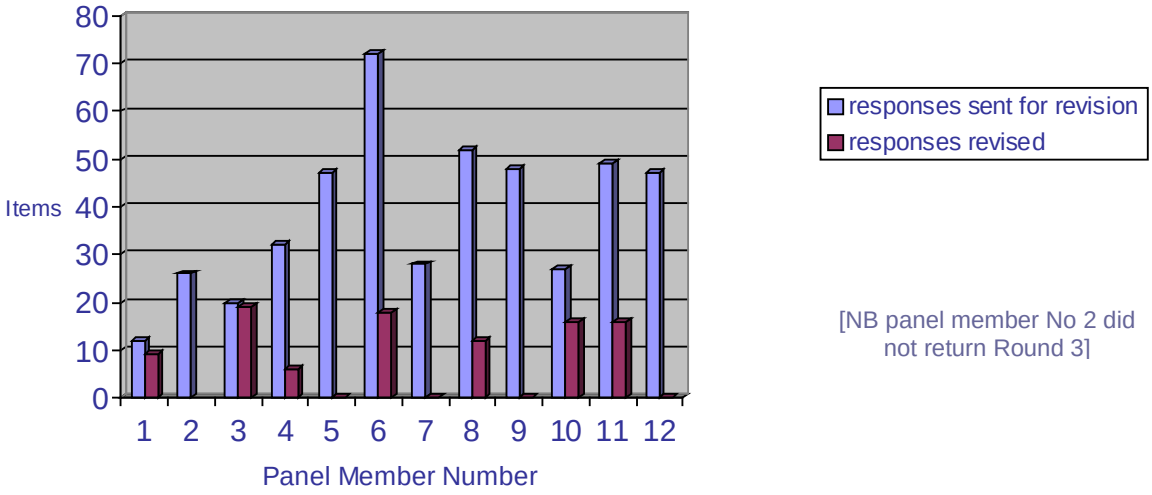
Response	Your rating	Panel rating: Mode	Panel Percentage agreement	Your revised rating (if desired)	Comments
Annual review	1	4.5	66%		

Table 2: Summary of Participation Rates and Returns

Panel Members	Invited	Agreed to Participate	Subsequently Withdrew	Delphi Panel	Completed Round 1	Completed Round 2	Completed Round 3
Nurse Educators	10	10	0	10	9 *	8 ⊕	8
Clinicians	6	5	2	3	3	3	3

Table 3 Summarised Agreement Results of the Delphi Rounds

Round	**Total Items**	**Items with <25% agreement**	**Items >75% agreement**	**Items with 100% agreement**
2	315	12	126	33
3	315	14	161	34



[NB panel member No 2 did not return Round 3]

Figure 1: Variations to Round 3 Responses

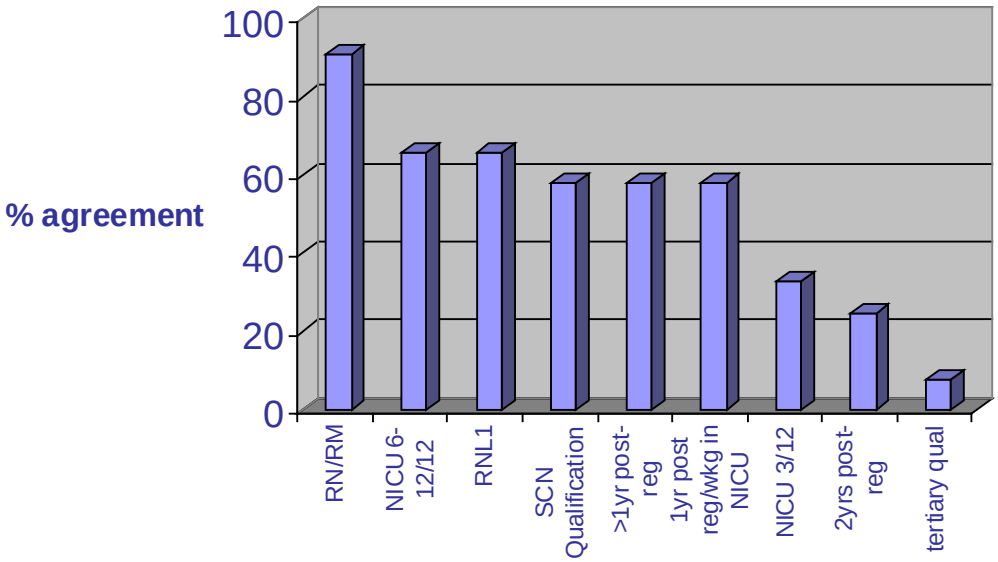


Figure 2: Course Pre-Requisite Experience

Table 4: Response to Question 4a

The NICNC should have 200 hours of theory over 12 months

	Mean	**SD**	**Median**	**Mode**	**%agreement**
ROUND 2	3.8	1.5	5.0	5.0	63.6
ROUND 3	4.3	1.2	5.0	5.0	81.8