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Topic 3

Clinical skill development

Literature reviews to support the Independent Review of Nursing Education – Educating the Nurse of the Future

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All contributors are individually listed in Appendix 1 of this document.

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Abbreviations

Abbreviation	Definition
ACEN	Accreditation Commission for Education in Nursing
APRN	Advanced Practice Registered Nurse
BN	Bachelor of Nursing
CALD	Culturally and Linguistically Diverse
CCNE	Commission on Collegiate Nursing Education
CoI	Community of Inquiry
ED	Emergency Department
EI	Emotional Intelligence
EN	Enrolled Nurse
ESL	English as a Second Language
IELTS	International English Language Testing System
IEPS	Interdisciplinary Education Perception Scale
IPE	Interprofessional Education
IPL	Interprofessional Learning
NCLEX	National Council Licensure Examination
NMBA	Nursing and Midwifery Board of Australia
NMC	Nursing and Midwifery Council
NONPF	National Organization of Nurse Practitioner Faculties
NP	Nurse Practitioner
OSCE	Objective Structured Clinical Examination
PEP	Professional Experience Placement
RIPLS	Readiness for Interprofessional Learning Scale
RN	Registered Nurse
RTO	Registered Training Organisation
SBE	Simulation Based Education
TAFE	Technical and Further Education

Key messages

At the centre of Topic 3 is the concept of the clinical skill development of registered and enrolled nurses and nurse practitioners. The main factors contributing to the development of clinical skills were the methods by which skills were taught and consolidated, specifically the educational approaches to learning, including simulation, interprofessional education and clinical placements.

Student registered nurse (RN) pre-registration clinical skills

- Student RN pre-registration educational programs have been acute care focused, with less emphasis on chronic and complex care, aged care, primary health care and mental health.
- There are no explicit core skills, knowledge and attributes defined for student RNs to be able to safely perform in Australia.
- Inconsistencies in the educational content and the methods used to teach this content were identified in Australian studies.
- There was an emphasis in the literature on studies related to teaching non-technical skills (e.g. communication, empathy, teamwork), indicating the importance of these skills and an eagerness to understand how best to teach them.

Student RN approaches to teaching and learning

- The diversity and novelty of approaches to learning indicated a genuine shift away from traditional didactic pedagogy. The motivation for most approaches was to ensure the clinical relevance of education and the capacity for students to apply what they have learned. It was difficult to identify the optimal approach to learning as most of the approaches to learning studied held some advantage over traditional lectures and the quality of the evidence meant that definitive conclusions could not be drawn.

Student RN simulation

- Simulation appeared to be a well accepted and a frequently-used approach to teach both technical and non-technical skills. The volume of literature and diversity of simulation approaches conveyed the enthusiasm and commitment of academics to ensure authentic and clinically-applicable learning experiences.
- There was conflicting evidence regarding the optimal simulation approach, although several studies indicated that high to medium fidelity simulation was amongst the most effective. Studies also indicated that simulation was most effective for the development of psychomotor and cognitive skills.
- The educational preparation of those delivering simulation differed and was sometimes unclear or not reported.
- In relation to simulation and approaches to teaching and learning, there is a need for well designed studies that provide evidence of student learning, its translation to the clinical setting and impact on patient care outcomes.

Student RN clinical placements

- Clinical placements are an important factor in clinical skill development.

- A number of studies focused on student attitudes to placements in specific settings such as aged care, mental health and primary care. These studies reported that students were often initially negative towards placements in these areas.
- Clinical facilitation and the attitude of staff in clinical areas appeared to be the most important factors in student satisfaction with clinical placement experiences. It is unclear what impact these two components have on learning and skill competence as these were not measured in the studies included in this review.
- The education of facilitators and RN preceptors can improve their confidence and their perceived preparedness to facilitate students. In instances where a university had direct and regular engagement with the clinical setting, this also appeared to strengthen the quality of the clinical placement.
- In some studies, the authors referred to the challenges of obtaining a sufficient quantity and quality of clinical placements for their students.

Student enrolled nurse

- Enrolled nurses (ENs) are an understudied group within the nursing profession in Australia and internationally.
- There is limited evidence underpinning EN education.

Nurse Practitioner candidate

- The educational preparation of nurse practitioner (NP) candidates is understudied in the literature.
- There may be value in exploring a prescriptive approach to NP education that includes specified core clinical skills, including those required to manage primary and chronic and complex care presentations.

1 Introduction

The Australian Government, Department of Health¹ announced an 'Independent Review of Nursing Education – Educating the Nurse of the Future' (the Review) as a measure in the 2018/19 Federal Budget in May 2018. It will examine how current educational preparation in Australia equips nurses to meet the future needs of the Australian community. The Review is scheduled for completion in 2019 and this project represents an important initial phase.

The Department of Health commissioned a team from the Centre for Health Service Development and School of Nursing, University of Wollongong, to complete a series of literature reviews on particular topics identified as highly relevant to the Review.

1.1 Aims and objectives

This is the third of four literature reviews to inform the national 'Independent Review of Nursing Education – Educating the Nurse of the Future' in Australia.

Each topic has research questions that have been specified by the Department of Health. The results of these literature reviews are presented to prompt and inform discussion and conversation about particular issues that in summary relate to:

1. Fitness for purpose, work readiness and transition to practice.
2. Nursing as a career choice.
3. Clinical skill development.
4. Future directions in health care delivery.

These are important issues for policy development and decision-making about the future directions of nursing education in Australia. The aim of nursing education is that it adequately prepares nurses of all levels and endorsement, to safely and competently perform their roles; it is from this perspective that these reviews have been framed.

The three nursing designations in-scope for these literature reviews are: Enrolled Nurses (ENs), Registered Nurses (RNs) and Nurse Practitioners (NPs).

1.2 Project governance and implementation

The project governance structure is outlined in Figure 1. To ensure an appropriate breadth and depth of nursing expertise a national working group of nursing educators and clinicians was established and complemented by an international nursing education advisory team. The national nursing education working group comprises exceptional nursing educators and clinicians drawn from across Australia. The members of this working group have reviewed the search strategy and topic maps, advised on literature selection, in several instances contributed with analysis, synthesis and write-up of sections and reviewed and commented upon the draft version of each literature review.

An international advisory team comprising three experts in nursing education from the United States (US) and United Kingdom (UK) has facilitated exploration of the international context. These international team members have been actively engaged and provided advice on issues

arising during the course of the project. They have also reviewed and commented upon the draft version of each literature review prior to their final submission to the Department.

The work of producing the literature reviews has occurred through four topic teams which included academic staff predominantly from the University of Wollongong, University of Sydney and Western Sydney University. Project leadership was provided by the Centre for Health Service Development and critical review and revision of the draft literature reviews supported by the School of Nursing, University of Wollongong. All personnel contributing to this project are acknowledged in Appendix 1.

Figure 1 Project governance and implementation framework



1.3 Topic 3 Clinical skills development

The literature review for Topic 3 addressed the following:

- What factors contribute to optimal skill development? Examine current trends and interventions utilised to develop clinical skills in pre-registration (registered and enrolled) nursing programs and NP programs - including immersion in clinical settings and the use of simulation.

This question focuses on the period of education prior to qualification and enrolment as an EN, registration as a RN or endorsement as a NP. The evidence gathered and synthesised for Topic 3 came from studies undertaken during the pre-registration training period, thus excluding any studies involving or relating to ENs, RNs or NPs. The definition of the training period used for this review was from the point of enrolment into a nursing educational program, to the completion of the program.

The definition of clinical skills used in this review includes the technical and non-technical skills, knowledge and attributes required of an EN, RN and NP. Technical skills include clinically focused procedures such as medication administration and performing a wound dressing. These skills can usually be measured in their performance against an existing standard or best practice guideline. Examples of non-technical skills include leadership, communication, critical thinking, teamwork, emotional intelligence and resilience. The non-technical skills are less

objectively measured and assessed. For this reason they are sometimes referred to as ‘soft skills’ in the literature. A glossary of definitions is provided. Although important to course completion, academic skills were out of scope of this review, unless they had a direct relationship to clinical skills, such as numeracy and literacy.

Nursing is a practice profession. In order to safely care for patients there are certain skills, knowledge and attributes that all nurses are expected to possess. The skills required of an EN, RN and NP are different in terms of their breadth, depth and complexity. For this reason the approach to their educational preparation differs to enable the post-holder to perform at the required level. In Australia, each nursing designation is guided by the standards of practice provided by the Nursing and Midwifery Board of Australia², and these standards are discussed further in subsequent sections. The purpose of the standards is to provide an expectation of the skills, knowledge and attributes that can be expected of an EN, RN or NP.

Healthcare delivery is an ever changing landscape and standards of practice are regularly reviewed to maintain relevance and currency. It is important that the standards reflect the combination of both technical and non-technical skills, as well as the philosophy underpinning nursing itself. Nursing adopts a holistic, person-centered approach and it acknowledges that care and compassion, are equally as important as technical and non-technical skills. In this way contemporary nursing continues to honour and reflect the values of its founding traditions. In the words of Nightingale:

*‘The very first requirement in any hospital is that it does the sick no harm’.*³

In clinical practice the balancing act between the delivery of technical and non-technical skills is challenging. The general public and clinical services have high expectations of nurses’ standards of practice. Therefore, the educational preparation of nurses must be rigorous, evidence-based and relevant to current and future health systems. The breadth of knowledge and skills, clinical reasoning and critical thinking required of nurses in their daily practice is extraordinary. It is important that their basic education provides the EN, RN or NP with the skills, knowledge and attributes to meet the challenges that they will face on entry into the workforce.

2 Methods

The short timeframe for implementation of this project (approximately six weeks), necessitated a focused and robust methodology flexible enough to adapt to emerging issues and requirements.

Through these literature reviews the current state and future directions for nursing education are reported, as interpreted from careful analysis of international literature reviews, primary Australian research studies and the grey literature. The literature reviews have uncovered a large quantity of literature on each of the four topic areas. It is not intended to present a detailed analysis of the totality of literature available, as might be the case with a systematic review. Instead, a purposeful narrative review of existing literature is provided, with focus on the implications of key issues for contemporary nursing education in Australia.

These reviews recognise both the technical components of educational preparation as well as the non-technical and philosophical emphasis on nursing as a caring profession. At the heart of nursing and nursing education is the therapeutic relationship between nurse and patient which is built upon the delivery of safe, kind and compassionate nursing.⁴

2.1 Conducting a literature review

There are multiple forms of literature review which are distinguished by their characteristics and associated methodologies. Grant and Booth^{5, p 91} developed a typology of 14 review types and concluded that ‘...few review types possess prescribed and explicit methodologies and many fall short of being mutually exclusive. The term “literature review” is generic’.

In nursing and health care, common forms of literature review include the systematic review, integrative review and narrative review. It is important to discriminate between these forms of review. Systematic reviews are used to answer highly specific questions about an intervention or aspect of clinical practice⁶, particularly where high levels of evidence may be required. Systematic reviews report in detail on individual studies using explicit criteria and critically evaluate the level of evidence using an accepted hierarchy or classification system.⁷ The completion of a systematic review usually requires a substantial timeframe. Integrative reviews are used in nursing research to create and organise a body of literature. They are frequently preferred as they allow the combination of diverse methodologies and aim to provide an in-depth understanding of the topic under study.⁸

Where the purpose of the review is to explore broad or complex issues, deepen understanding through integration of findings and critically reflect on the literature a narrative review is preferred, which is the approach adopted for this review. The value of expert-led narrative review for policy makers lies in a ‘... meaningful synthesis of research evidence relevant to such complex situations that incorporates a broad range of sources and multi-level interpretation and critique’^{9, p 2}. The completeness of searching is determined by time/scope constraints, there may be no formal quality assessment or appraisal of each paper, the synthesis can be tabular with narrative commentary and the analysis uses key features to characterise the quantity and quality of literature.⁵

An effective literature review requires an appropriate understanding of the issue or topic of focus; defined parameters and boundaries; a clear search and selection strategy; intelligent

critical analysis and synthesis that leads logically to conclusions that address the original research question(s); good structuring to enhance flow and readability and accurate referencing to identify relevant sources.

2.1.1 General methods

For all four literature review topics common search parameters were established with appropriate limits and exclusions. The short project timeframe led to a focus on both international and Australian peer-reviewed academic literature retrieved from a specific range of databases: Scopus, CINAHL Plus, Medline and Health Source (Nursing / Academic edition). Database searching was supplemented with snowball searching (pursuing references of references and tracking citations forward in time).

Each topic team was supported by a research librarian from the University of Wollongong who advised on database selection and search term combinations. The research librarians assisted with preliminary searches and prepared reports on journal impact on the basis of the final sources selected for inclusion in each literature review.

Every effort was made to enhance the efficiency of searching by seeking out systematic reviews, meta-analyses, meta-syntheses and other literature reviews. This often provides a prompt overview of the spectrum of issues relevant to the particular topic. If the search results did not generate appropriate or adequate reviews then additional peer reviewed literature was identified.

Searching the academic and grey literature focused on literature from Australia and other English speaking countries, specifically; the United Kingdom (UK), Ireland, the United States (US), Canada, and New Zealand (NZ). These countries were selected as their experiences in nursing education are more likely to be generalisable to the Australian context.

2.1.2 Topic specific methods

Reviewing the literature involved three steps, which occurred concurrently.

Step 1: Searching for existing reviews of the literature (however named) to identify the evidence from the international literature, while recognising that this literature includes some Australian studies.

Step 2: Searching for primary studies undertaken in Australia to investigate the factors contributing to optimal skill development. This included exploration of approaches to learning, the use of simulation, clinical placement, interprofessional education (IPE) and the assessment of learning including competency. As well as searching specific databases, a hand search of the journals Collegian, Nurse Education Today and Nurse Education in Practice was undertaken. In addition, snowball searching occurred to pursue references and resulted in a small collection of additional studies. Literature was also obtained via consultation with experts in the field and a search of the following prominent authors: Professor Tracey Levett-Jones; Professor Debra Nestel; and Mrs Sharon MacLean.

Step 3: Searching for grey literature, focused on websites with .gov, .edu and .org from Australia, the UK, Ireland, the US, Canada, and NZ (or their equivalents) using the Google search engine.

Following an initial scoping of the literature available, the concepts inherent to Topic 3 were deconstructed into six sub-topics the first of which focused on the clinical skills that are currently required for each nursing role, EN, RN and NP. The clinical skills sub-topic was fundamental to discussions of optimal skill development and the transparency of educational preparation for nursing roles.

Table 1 Sub-topics for Topic 3

Sub-topic	Comments
Clinical skills	To identify the clinical skills currently required for each nursing role: EN, RN, and NP.
Approaches to teaching and learning	Exploration of current approaches to teaching and learning to identify approaches commonly applied to nursing curriculum and how successful they are in facilitating optimal skill development e.g. peer learning, team based learning.
Interprofessional education	Interprofessional education has become a contemporary focus in the delivery of nursing education. Exploration of the application of interprofessional education to investigate the outcomes of this approach and the international perspective on its mandatory inclusion in nursing programs.
Assessment of learning	Exploration of the methods of skill assessment to provoke further discussion on the standardisation of assessments, including national examinations, oral viva voce and objective structured clinical examinations.
Clinical placement	Exploration of clinical placement hours, with a view to identifying underlying rationale for the quantity of clinical hours and the competencies assessed during those clinical hours. Exploration of the contexts of clinical placements, for example, paediatrics, aged care, critical care, mental health.
Simulation	Investigation of the types of simulation used, the purpose and outcomes of simulation in developing clinical skills and examples relating to the use of simulation as a substitute for clinical placement hours.

Details of the search strategies and search terms are included in Appendix 2. The inclusion and exclusion criteria are detailed in Table 2.

Table 2 Inclusion / exclusion criteria

Inclusion	Exclusion
International Literature	
Literature reviews identifying skill (technical/non-technical) development or assessment in student ENs or student RNs or NP candidates.	Literature reviews focusing on post-graduate specialist clinical skills unless they are directly related to the preparation of NPs, e.g. emergency nursing, primary care nursing.
As a minimum, literature reviews must specify the databases searched, the search terms, and the inclusion/exclusion criteria.	Studies that focus only on the development of a measurement tool.
English language literature reviews only.	
2012 to present.	
Literature reviews that focus predominantly on studies from Australia, the UK, Ireland, the US, Canada and NZ.	
Australian Literature	
Studies of student ENs or student RNs or NP candidates that include skill development (technical or non-technical).	Studies identifying transition to practice programs.
Studies identifying how interprofessional learning, peer learning, clinical placement, simulation, learning theories/ approaches to education contribute to skill development in student ENs or student RNs or NP candidates.	Studies that focus only on the development of a measurement tool.
Studies identifying how skills are assessed in programs of study related to student ENs or student RNs or NP candidates.	Studies that focus on development of academic or scholarly skills without clinical application or focus.
Grey Literature	
Government, education and key stakeholder organisation reports from Australia, the UK, Ireland, the US, Canada and NZ.	Non-research based data, including personal opinion, editorials, propaganda.
Website addresses with .org, .gov, .edu. or their equivalents such as .gc.ca (Canadian government), .govt.nz (NZ government) or .ac.uk (UK education) and .ac.nz (NZ education).	

The pdf files of included literature reviews and Australian studies were imported into NVivo (2018). NVivo was then used to facilitate analysis and synthesis of the content of those papers by coding the results, discussion and conclusion sections to identify:

- the skill focus of the paper
- how the skill was taught
- what was learned and how learning was measured
- factors affecting skills development and learning.

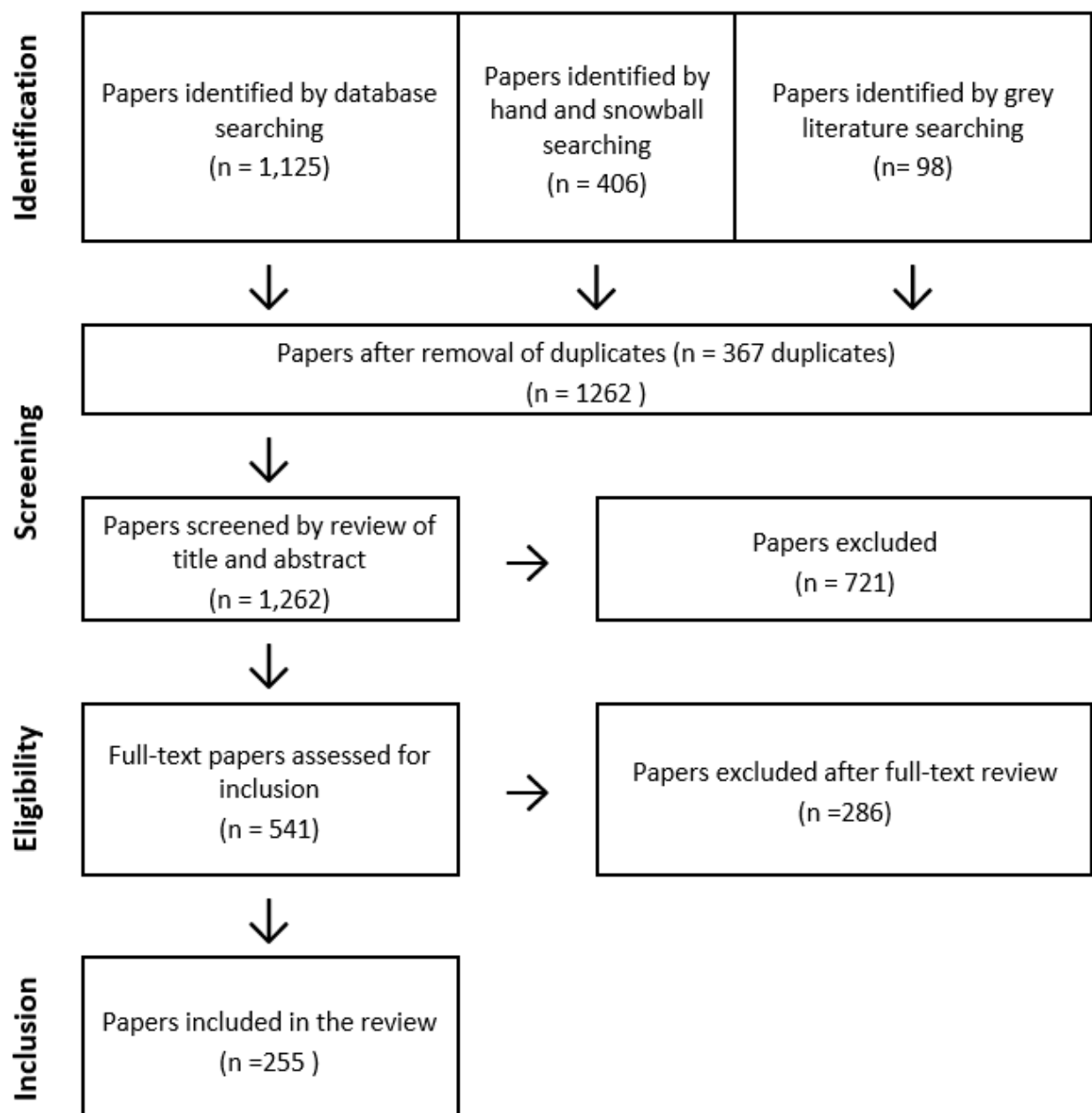
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The inclusion and exclusion criteria for the international reviews, Australian primary research papers and the grey literature are shown in Table 2. References obtained through all search strategies were screened for relevance by title and then entered into an Endnote database for management, where duplicates were then removed. References were culled by title and/or abstract and continuing to apply inclusion and exclusion criteria. Full text of remaining articles were obtained for further review and 286 were excluded, leaving a final sample of 255 papers. The eligibility process is outlined below in Figure 2.

2.2 PRISMA flow diagram

The flow diagram shown below in Figure 2 summarises the results of searching the academic and grey literature.

Figure 2 PRISMA Flow diagram



2.3 Methodological quality

2.3.1 General issues

At the outset of the literature reviews it was difficult to predict the volume of relevant and available literature for each topic. The process of sifting through what may be a very large volume of literature can be aided by using an evidence hierarchy that clearly explains the differing levels and quality of evidence. 'Levels of evidence' are often represented as a pyramid with the highest levels of evidence at the top that is, systematic reviews and randomised controlled trials. This makes sense when assessing, for example the efficacy of an intervention. It can be challenging when conducting narrative reviews to apply this hierarchy as a substantial proportion of useful literature may not have been derived from these higher levels of evidence.

While initially it was anticipated that this process could be aided through using an appropriate critical appraisal tool to describe each of the included studies it soon became apparent that this would not be possible within the available timeframe. Throughout each literature review summaries and syntheses of key sources are provided in tabular form, however these are deliberately not exhaustive. In collaboration with the Department of Health a decision was made that the available time was better invested in comprehensive analysis and intelligent synthesis of findings.

2.3.2 Topic-specific issues

Due to time constraints, no formal assessment of the quality of the literature reviews included in this review was undertaken. However, it was noted that, in general, within the international literature the research questions addressed were well defined, and the methods clearly articulated, including inclusion and exclusion criteria. The majority reported the degrees of potential bias in the studies. There was limited detail regarding the excluded studies and the reasons for exclusion. The quality of the evidence was noted frequently in the literature reviews in terms of the sample size and the number of sites at which studies had been undertaken. There was a lack of experimental research, particularly randomised controlled trials. The following examples are indicative of many similar observations:

- 'Although every paper claimed the benefits of questioning in fostering thinking processes, more needs to be done to reinforce the empirical evidence on the subject'.¹⁰
- 'Overall, use of a constellation of instruments and a lack of high quality study designs mean that there are still some gaps in evidence of effects that need to be addressed'.¹¹
- 'This study included a limited number of studies in the meta-analysis, and many studies were conducted with a small number of participants due to the early stage of research on simulation-based education'.¹²

The quality of the Australian primary studies included in this review reflect these observations about the international literature. One of the most significant limitations of the studies was that there were very few attempts to evaluate the degree to which the learning about skills, knowledge and attributes was translated from the research setting into real-time clinical practice. Whilst they provide valuable information, such studies are complex to conduct given the range of variables. The majority of studies focused on self-reported data, such as student satisfaction or perceived level of learning, which offers only a unilateral perspective. Further, very few studies offered longitudinal data in relation to skill development and maintenance of

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knowledge, skills and attributes. The report on journal impact for included papers is included as Appendix 3.

3 Introduction to the presentation of the results

Topic 3 includes a range of sub-topics and covers three nursing roles in training –student EN student RNs, and NP candidates. Student RNs are also known as nursing students and student nurses. In this review, to differentiate between the other two groups of students (EN and NP), the term ‘student RNs’ is used throughout the document. Most of the focus of Topic 3 is on what happens in the educational setting, except for the sub-topic on clinical placements.

The range of issues incumbent to Topic 3 presented challenges in terms of how best to present the findings, particularly as the results of some reviews/studies may have a bearing on more than one issue (e.g. a study that involves student RNs undertaking an interprofessional clinical placement). The findings are primarily structured in terms of the three nursing designations (student EN, student RN and NP candidate). The vast majority of the literature identified focused on student RNs, requiring a detailed series of sub-headings in that section of the report. Despite extensive searching, limited literature was found around student ENs and NP candidates.

Given the very short time-frame to complete the review, it was never intended that the findings would include a detailed description of every literature review or study included in the review. However, it is important to present the findings in sufficient detail so that the evidence supporting the interpretations is clear to the reader. Therefore, tables summarising included sources have been used to provide this evidence and to indicate the emphasis or trend within the literature.

4 Student registered nurses

The overwhelming majority of international reviews and Australian studies that were identified, explored the factors contributing to clinical skill development amongst student RNs. These included approaches to learning, assessment of competency, clinical placements and simulation (Table 3). Analysing such a large volume of literature was extremely challenging in the time-frame available for this review. In the presentation of the results there are a number of summary tables which provide an overview of the available data. Where possible, the reviews and studies were purposefully sampled. The studies that were most relevant have been explored in greater detail and presented in this report. It is acknowledged that nursing education differs between the countries included in the reviews (Australia, the UK, Ireland, the US, Canada and NZ). Combined with the heterogeneity of interventions and outcomes this made direct comparisons of the reviews impossible. Instead the included reviews have been analysed for trends.

Table 3 Relevant sources about student registered nurses

Category	International literature reviews	Australian studies
Clinical skills	21	30
Approaches to teaching and learning	16	28
Interprofessional education	7	5
Assessment of learning	10	4
Clinical placement	11	53*
Simulation	25	36*
Total	90	156

*Includes one literature review of Australian studies

4.1 Clinical skills

In this section an overview of the clinical skills reported in the literature is presented. A discussion of the standards of practice is included to provide context to the educational preparation of student RNs across the countries included in this review.

4.1.1 International literature

An extraordinary range of clinical skills were reported across the international literature, which is an indication of the breadth and depth of skills and knowledge required to safely perform in the RN role. Many papers reported approaches to learning and the application of simulation, some of which focused on the educational design rather than identifying the skills being taught or the factors impacting skill development. Several papers focused specifically on the development of a single clinical skill (n=21) and others focused on the development of nursing skills in a specific context, such as simulation, clinical placement and IPE. Table 4 summarises the prevalence of skills identified across all of the reviews. There were 17 reviews relating to non-technical skills, perhaps indicating an enthusiasm to explore how these soft skills can be developed. These non-technical skills included communication (n=4), collaboration (n=3), cultural competence (n=2), empathy (n=2), moral courage (n=2), and one review each that focussed on teamwork, resilience, emotional intelligence, and conflict resolution.

Table 4 Prevalence and examples of reviews identifying specific technical and non-technical skills

Clinical skill	Example from the international literature	No. reviews on this topic
Critical thinking and clinical reasoning	Systematic review: US (10) Korea (4) Hong Kong (2). There are conflicting research results regarding the capacity for simulation to develop student RNs critical thinking. ¹³	2
End of life care	Systematic review: Australia (1), Canada (1), US (14), UK (1). Lack of consistency in content of preregistration courses in palliative care within and between countries. ¹⁴	3
Intellectual disability care	Review: UK (8), NZ (2), US(1), Netherlands (1), Israel (1). Review indicated a lack of preparation at the undergraduate level, consequently RNs feel unprepared to work with patients with a learning disability because they have had very limited experience and education in this area. ¹⁵	1
Medication knowledge administration	Integrative review: US (5), Australia (3), UK (3), Finland (3), NZ (1), Norway (1), Sweden (1), Turkey (1), Japan (1) Factors associated the medication competence of student RNs are individual factors such as learning strategy, clinical learning environment (e.g. learning opportunities and supervision), and the content of medication education. ¹⁶	2
Mental health	Review: Australia (11), Norway (1), Netherlands (1), Finland (1), Brazil (1). There is limited mental health focused content in undergraduate courses. There is evidence that students feel anxious and unprepared to face the realities of modern day mental health care. ¹⁷	3
Non-technical skills	Systematic review: 23 quantitative studies of empathy interventions for student RNs were reviewed. Australia (3), Canada (1), US (11), Europe (7), Taiwan (1), less than half (9/23) significantly improved empathy levels. ¹⁸	17
Patient safety competencies	Rapid review: 17 studies. Few studies described the patient safety competencies included in undergraduate nursing education and what needs to be learned in the curricula. ¹⁹	4
Sexual health	Review: 8 studies US (2), Taiwan (2) Turkey (2) UK (1) Hong Kong (1) Education on sexual health is not perceived as a priority and lack of time is reported as the main barrier to including sexual health content in pre-registration courses. ²⁰	1
Spirituality	Review: US (7) Norway (2) Canada (1) Spiritual care is reportedly overlooked in undergraduate education and therefore it can be challenging for students to develop competence in this area. ²¹	2

The tendency for educational programs to emphasise acute care content,²²⁻²⁴ was a point of discussion in the international reviews, relating to primary health care and other specific clinical settings. Several authors stated that their motivation for conducting the review was to explore how a specific skill was integrated into nursing education, because the skill was not adequately taught and therefore once qualified, nurses would not be equipped to deliver specific care or skills. This was particularly prevalent in the reviews of mental health education,¹⁷ end of life care,¹⁴ intellectual disability,¹⁵ sexual health,²⁰ and spiritual care.²¹ In a review of undergraduate nursing students' understanding of mental health, the authors state:

With emerging recognition of the indiscriminate and widespread effect of mental health related illnesses, many authors have turned their attention to the preregistration nursing curriculum and its modest investment in preparing graduates for the upward trajectory of mental health related presentations.^{17, p 160}

In their review of mental health education, Barry and Ward¹⁷ found inconsistency in the provision of mental health education in Australia. The review draws on four studies from Australia, in which there was significant variation in the number of theoretical tuition hours devoted to mental health and the number of clinical placement hours.¹⁷

A review by Australian authors, Neville and Goetz,²⁵ sought to examine the educational strategies used to deliver mental health content. The review included papers from Australia (n=5), US (n=4), NZ (n=2), and UK (n=1). The impetus for their review stemmed from an Australian report on the mental health content in student RN educational preparation. The report, entitled *Mental Health Nurse Education Taskforce*, identified three recommendations: an increase in mental health content, strengthening of mental health nursing leadership and increased consumer participation.²⁵ The authors concluded that the inclusion of mental health content is not only an important issue for Australia, nursing faculties internationally are closely monitoring their curricula as well.

Prioritising content within nursing programs has clearly been a challenge for nursing curricula and the presence of inconsistency in the content of programs, even within the same country,^{14,17,26} was identified in several reviews. This issue was further compounded by the limited description of the educational programs in included studies which made it difficult for review authors to understand the specific content in terms of the number of hours of face-to-face teaching, how the programs were taught, and the clinical practicum experience of the student RNs.^{14,27}

Of interest, there was no clear articulation of exactly what skills students needed to acquire within any of the reviews. The skills that were discussed in the reviews related to both acute and chronic care, with an emerging trend for literature to focus on the soft, non-technical skills such as resilience and empathy.

4.1.2 Standards for practice

The requirements of nursing regulatory authorities in each of the countries of interest were explored to understand the skills knowledge and attributes which student RNs require for graduate practice (Table 5). In Australia,²⁸ the UK,²⁹ Ireland,³⁰ Canada,³¹ and NZ,³² the skills, knowledge and attributes required of RNs are guided by a series of standards of practice or competencies that are endorsed by the relevant registering body. In the US, specific

competencies for RNs' practice were not identified and the readiness for practice of a graduate was assessed via a national examination, the National Council Licensure Examination - Registered Nurse (NCLEX-RN).³³ Examinations are also used in Canada and NZ. Furthermore, each of the countries of interest had nursing curriculum accreditation processes through which any program leading to registration as a nurse is formally reviewed and accredited.^{29,34-40}

Across the six countries (Australia, the UK, Ireland, the US, Canada and NZ) the level of detail in the competency documents and accreditation standards was fairly broad. This means that there is a degree of interpretation in terms of curriculum content and the approach to the delivery of that content, with limited guidance on the exact content of programs and the methods by which the content should be taught. For example, in the Canadian Association of Schools of Nursing Program Standards³⁶ there is some broad guidance on program content as follows:

The curriculum provides learning experiences related to primary health care, health promotion, prevention, curative, supportive, rehabilitative, and end-of-life care, across the life-span of individuals, families, groups, communities and populations; promotes interprofessional practice and addresses regulatory entry to practice competencies.^{36, p. 23}

Table 5 Educational preparation of a registered nurse by country

Country	Role Title	Training	Assessment standard	Clinical hours required
Australia	RN	2 year graduate entry Master's 3 year Bachelor 4 year combined Bachelor/Master's	RN standards for practice ²⁸	800 hours
UK	RN adult, children, mental health or learning disability	3 year Bachelor	Standards of proficiency for RNs. ²⁹	2,300 hours
Ireland	RN general, paediatrics, paediatric & general, psychiatric	4 year Bachelor (final year internship)	Scope of Nursing & Midwifery Practice, ³⁰ Guidance to Nurses and Midwives on Medication Management. ⁴¹	2,300 hours
US	RN	2 year community college associate degree 3 year Diploma 4 year Bachelor 2 year graduate entry Master's	Pre-registration exam NCLEX-RN. ³³	Varies by State/Nursing Boards, up to 1,150 hours
Canada	RN Registered Psychiatric Nurse	4 year Bachelor	Pre-registration exam and RN competencies for each province. ³¹	Varies by Province/Territory, e.g. Ontario 1,035 hours, Saskatchewan 1,240 hours

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Country	Role Title	Training	Assessment standard	Clinical hours required
NZ	RN	3 year Bachelor	Pre-registration State Final Exam and competencies for the RN scope of practice. ³²	1,100 hours

Following recent concerns around the standards of nursing practice presented in the *Willis Report*⁴² and the *Francis Report*,⁴³ the Nursing & Midwifery Council (NMC), UK, has reviewed its standards for registration. Through a series of consultations entitled *Programme of Change for Education* the NMC has used expert advice and existing evidence to generate the *Standards of Proficiency for RNs*.²⁹ In the Appendix B of the proficiency document, the NMC describe the skills and procedures that RNs are to be able to demonstrate at the point of registration to adequately assess care needs and to plan, provide and manage person-centred care. For example:

Part 1: Procedures for assessing people's needs for person-centred care

1. *Use evidence-based, best practice approaches to take a history, observe, recognise and accurately assess people of all ages:*
 - 1.1 *mental health and wellbeing status*
 - 1.1.1 *signs of mental and emotional distress or vulnerability*
 - 1.1.2 *cognitive health status and wellbeing*
 - 1.1.3 *signs of cognitive distress and impairment*
 - 1.1.4 *behavioural distress based needs*
 - 1.1.5 *signs of mental and emotional distress including agitation, aggression and challenging behaviour*
 - 1.1.6 *signs of self-harm and/or suicidal ideation*
 - 1.2 *physical health and wellbeing*
 - 1.2.1 *symptoms and signs of physical ill health*
 - 1.2.2 *symptoms and signs of physical distress*
 - 1.2.3 *symptoms and signs of deterioration and sepsis.*^{29, p 32}

The development of a set of procedures could be considered somewhat reductionist, and task-orientated representing a departure from the person-centered philosophy underpinning the nursing profession. The nursing role is clearly more complex than being able to complete a list of specific procedures and tasks. However, the NMC have integrated both the technical and non-technical skills into their practice standards using a person-centred approach thereby attempting to reinforce the nursing philosophy underpinning them. The provision of an explicit list of skills, knowledge and attributes is conceptually alluring in terms of reducing inconsistency amongst the performance of graduates. As yet, however, there is no evidence to demonstrate that these kind of specific practice standards impact on student learning, reduce inconsistencies in graduates' clinical skills, knowledge and attributes or improve clinical outcomes and patient safety. Further research is required to evaluate how these standards are translated into nurse education, clinical skills acquisition and provision of quality clinical care.

4.1.3 Australian Literature

Thirty Australian studies were included relating to technical (n=19) and non-technical skills (n=11). As with the international reviews, the range of skills covered was diverse. The skills have been summarised and examples of the studies provided in Table 6. There are some obvious similarities to the international reviews, particularly in relation to the non-technical skills of empathy and communication. There is also a greater focus on cultural topics in the Australian literature.

Four studies focused on medication administration.⁴⁴⁻⁴⁷ Medication incidents are one of the most common types of clinical incidents to be reported in Australian hospitals.⁴⁸ One of these studies, undertook a cross-sectional exploratory investigation of second year Bachelor of Nursing students at two Universities.⁴⁴ Students at each University received parallel medication administration instruction, including a two-hour lecture, followed by a three-hour clinical laboratory session in which written steps for medication administration were discussed along with observation of a 10 minute medication administration video followed by rehearsal of the skill. Thereafter, the two faculties differed in their approach to ongoing rehearsal of the skill, one faculty rehearsed in the laboratory setting under supervision of a nurse educator and the other rehearsed in clinical practice. Both sets of students were assessed using a similar process involving a competency assessment process against existing standards for medication administration using different approaches to clinical skill practice and assessment of competency. Students self-assessed their preparedness for medication administration by completing a validated preparedness questionnaire (n=88). All students perceived they were well prepared for medication administration and there was no statistically significant difference between the two groups in terms of preparedness, indicating that both approaches to rehearsal of this skill were successful.

Three studies focused on evidence-based practice in undergraduate nursing education.⁴⁹⁻⁵¹ One study used a pre (n=84) - post (n=33) test survey design to explore the impact of research education on student nurse attitude, skill and uptake of evidence-based practice following exposure to a 16-week research program.⁵¹ Students favoured evidence-based practice and there was no statistically significant increase in attitude between pre and post data. There was a statistically significant increase in the frequency of use of evidence-based practice and development of associated skills. Participation in the research program appeared to lead to an improvement in the frequency of reading and reviewing and using research findings to inform clinical practice.

Three studies focused on intercultural issues.⁵²⁻⁵⁴ One study focused specifically on student attitudes to Indigenous people and Indigenous health following completion of a specific course focused on Australian Indigenous Health.⁵³ The study administered two surveys, the *Attitude Toward Indigenous Australia Scale* (18 item) and the investigator developed *Knowledge Interest and Confidence Scale*, at the beginning and end of the course. Five hundred and two of 944 enrolments, completed the baseline survey and 249 the follow up; 1.4% of participants were Australian Indigenous people and 6.4% had experience working with Australian Indigenous people. The survey results reported a statistically significant decrease (50.6 to 49.1, $p = 0.017$) in scores on negative attitudes towards Australian Indigenous peoples and a statistically significant increase (15.5 to 19.1, $p < 0.001$) in scores on knowledge, interest and confidence in working with Australian Indigenous peoples.

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Table 6 **Prevalence of studies focusing on specific skills**

Skill	Example of study	Sample size	Study findings	Other studies on this topic
Biomedical science knowledge	Advancing student RN knowledge of the biomedical sciences: A mixed methods study. 3 day bioscience team teaching workshop. ⁵⁵	Survey n=9 Focus group n=4	Lectures were inadequate, too much material was covered in not enough time. The workshops provided an effective learning environment.	Salvage-Jones et al. ⁵⁶
Caring	Embedding fundamental care in the pre-registration nursing curriculum: Results from a pilot study. Piloted a 6 week intervention, that included the Fundamentals of Care framework. ⁵⁷	Pre n=36 Post n=45 Focus groups (n=17)	Themes identified included, usefulness of learning, importance of understanding a patient's perspective, developing confidence in psychometric skills and fundamentals of care, and perceptions that the fundamentals of care is common sense.	
Evidence-based practice	EVITEACH: A study exploring ways to optimise the uptake of evidence-based practice to undergraduate nurses. ⁵⁰ Over three years, second year Bachelor of Nursing students within a compulsory knowledge translation and utilisation subject at one university completed a subject evaluation survey and an online reflective activity in week 2 and 12.	2008 (n=40), 2009 (n=64) and 2010 (n=84).	The project, took a Plan-Do-Study-Act approach, which meant students provided feedback during the course to enable improvements and then further evaluations over the three years of the study duration. In 2008, student feedback indicated a lack of satisfaction with the course, the course was refined and in the two subsequent years students' satisfaction with the course increased significantly. ⁵⁰	Blackman and Giles ⁴⁹ Leach et al. ⁵¹
Emotional intelligence	Emotional intelligence (EI) increases over time: A longitudinal study of Australian pre-registration nursing students. Self-report scale administered four times over three years. ⁵⁸	n=111 over three years n=22 completed all surveys	Non-Australian students scored higher on managing own emotions than Australians. EI higher at third survey compared to the first, an increase in weighted average mark was associated with an increase in response to the sub-scale 'managing others'.	Foster et al. ⁵⁹ Williams et al. ⁶⁰ (empathy) Cooper and Chang ⁶¹ (spiritual care)
Intercultural	Strategies used by nurses, academics and students to overcome intercultural communication challenges. Focus groups, purposive sampling from one university and one tertiary hospital. ⁵²	n=19 facilitators n=5 RNs n=10 student RNs n=7 academics	Four themes 1) prejudices based on cultural diversity 2) unfamiliarity with cultural boundaries 3) stereotyping cultural behaviours 4) difficulty understanding English. Strategies to overcome cultural challenges included, cultural validation, seeking clarification and acquiring cultural knowledge.	Jacob et al. ⁵⁴ Hunt et al. ⁵³ Reid Searl et al. ⁶² (interpersonal skills)

Skill	Example of study	Sample size	Study findings	Other studies on this topic
Intimate partner violence	Nursing students' perceptions and understanding of intimate partner violence. Focus group and survey of Bachelor of Nursing students. ⁶³	Focus group n=27 Survey n=58	Results indicated that student nurses had limited awareness of intimate partner violence and they did not have a clear understanding of the role of a nurse in clinically managing IPV. The authors suggest that greater education is required.	
Medication administration	An education intervention to improve nursing students' understanding of medication safety. Series of short digital recordings as part of a problem-based learning approach. Investigator designed survey. ⁴⁶	n=28 second year Bachelor of nursing students	89% agreed the message related to safe medication practice was appropriate for Bachelor students. 68% agreed the learning tool was useful, 68% agreed the learning was applicable to current practice.	Lapkin et al. ⁴⁷ Aggar and Dawson. ⁴⁴ Coyne et al. ⁴⁵
Mental health	Undergraduate nursing and midwifery students' experiences of the Mental Health First Aid course. 13-hour course, students' experience explored via a 19 item investigator developed survey. ⁶⁴	n=66	89% participants strongly agreed they would recommend the course to others, 66% strongly agreed the course was relevant. Positive qualitative comments, greatest learning was an increase in insight about mental illness.	
Numeracy skills	Identifying strategies to assist final semester nursing students to develop numeracy skills: A mixed methods study. Final-year student RNs at one university. ⁶⁵	n=390	Three strongest predictors of success for passing the first numeracy test were 1) being an international student 2) practice quiz score of >59% 3) perception of confidence. Providing contextualised quizzes and hands on practice-based activities enhanced learning.	
Patient safety	Patient safety content and delivery in pre-registration nursing curricula: A national cross-sectional survey study. Online survey. ⁶⁶	n=16 Australian universities	Dedicated teaching hours focused on patient safety ranged from 1 to 120 hours, common topics were infection prevention and control, medication safety. Laboratory and tutorial sessions were the most common teaching strategy for patient safety topics.	Usher et al. ⁶⁷ and Usher et al. ⁶⁸ (Pressure injury) Gibson et al. ⁶⁹ (Risk screening) Stomski et al. ⁷⁰
Physical assessment	Too much knowledge for a nurse? Use of physical assessment by final-semester nursing students . Online survey. ⁷¹	n=239	Cardiovascular and neurological examinations were the most common amongst the fifteen core skills identified. Barriers to physical assessment included, lack of confidence, lack of nursing role models, not enough practice.	Birks et al. ⁷²
Skills - general	Undergraduate student nurses' self-reported preparedness for practice. Casey Fink	n=113	Most students perceived they were well prepared for practice, simulation and clinical skills practice were	

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Skill	Example of study	Sample size	Study findings	Other studies on this topic
	Readiness for Practice Survey of final year Bachelor students. ⁷³		considered helpful in facilitating skill development. Students were least prepared for 1) venepuncture 2) assisting intubation 3) caring for a person who has experienced physical trauma 4) inserting a guedel airway	

4.2 Approaches to teaching and learning

4.2.1 International literature

Sixteen reviews of the literature reported a diverse collection of approaches to teaching and learning in undergraduate nursing education. These included reviews of peer learning,⁷⁴⁻⁷⁶ online learning,^{77,78} reviews that synthesised studies to explore optimal approaches,⁷⁹⁻⁸² blended learning,^{83,84} problem based learning,^{10,85} mobile devices,^{86,87} and one review on social media.⁸⁸ The breadth and variety of techniques is perhaps an indication of the multiplicity of approaches adopted to teach RN students and the general move away from traditional approaches, particularly the didactic lecture. To understand the spread of the reviews, those not discussed in detail below are provided in Table 7.

Common to the reviews were discussions of the theory-practice gap and how to best achieve engagement from students and enable them to apply learning to clinical practice.⁷⁹⁻⁸¹ In the review of teaching techniques by Crookes,⁷⁹ the authors conclude that:

... nursing students need to be taught in a way that emphasises the practical use of the information they glean from the classroom so that they can become more engaged with the content.^{79, p 242}

In the spirit of bridging the theory-practice gap, four of the reviews sought to identify the optimal approaches to the delivery of student RN education.⁷⁹⁻⁸² Methods that appeared most effective were blended learning approaches, particularly combinations of lectures, online resources and clinical skills laboratory activities.

In their meta-analysis, Lee and colleagues⁸² reported that non-traditional teaching methods were more effective at developing critical thinking in student RNs compared to traditional methods. The analysis included a total of eight studies, 50% used a randomised pre-test post-test control group design. The learning techniques used to facilitate critical thinking skills across the eight included studies were, problem-based learning (3), concept mapping (3), collaborative methods and bioscientific methods (2). Each of these methods held some degree of success in achieving critical thinking learning outcomes, although the problem-based learning appeared least effective. Lee and colleagues⁸² concluded that whilst the approach to learning is important, the way forward is to ensure that education focused on critical thinking is implemented throughout the curriculum continuously. They cautioned that greater focus on the quality of research around teaching methods is required, to ensure the generalisability of the results.

A systematic review by Gill⁸⁰ explored the optimal approaches to teaching pharmacology. Twenty studies were included, eight of which compared online against blended learning techniques. Results indicated that online learning was flexible and enhanced procedural knowledge. Two included studies compared students who received information in a lecture against those who received video demonstrations of medication administration and reported that the latter group were more effective in providing patient education and were more effective at resolving patients' concerns. These two were the only studies to report a behaviour change in the participants. Whilst not all of the studies in this review were conclusive, there appeared to be a genuine link between improvements in learning and approaches to learning

that incorporated diverse modes of delivery. The least effective methods of delivery were traditional lecture, problem-based learning and flipped classroom.⁸⁰

Similar to the other reviews, Gill⁸⁰ highlighted some significant issues with the studies included in their review. For example, the majority were single-site design, with significantly different intervention exposures, ranging from courses that ran for one day up to 14 months. The assessment of learning outcomes tended to focus on pre and post-test self-reported increases in knowledge and student satisfaction rather than more objective measures of learning and its application to clinical practice.

Given the heterogeneity of the literature and limited evidence base, it is difficult to recommend one specific learning approach as better than another, given the quality of the designs and the various contexts in which the designs were tested in the studies. The literature did not highlight the quality of teaching/education or the skills required of the educator. It is apparent that educators are looking to use novel and creative approaches, beyond that of the traditional lecture, to engage and motivate nursing students to learn. In the integrative review by Crookes⁷⁹ the authors conclude that:

What is clear from a study of the literature is that nursing students crave knowledge that reflects “outcomes beyond the class”⁸⁹ and expect that the knowledge is communicated in a way that makes the content memorable and effective.^{79, p 241}

One of the reviews focused on social media as a platform for teaching and learning clinical, academic and professional skills.⁸⁸ The review included 12 studies, eight focused solely on undergraduate student RNs, four of which were from Australia. There were certain benefits reported of social media, such as the flexibility of using the various platforms (Twitter, Facebook, YouTube, Google+, Ning.com) and the confidence to ask a question that a student wouldn't have otherwise felt comfortable to ask in a face-to-face setting. Six of the studies were quantitative and none were sufficiently rigorous to identify the efficacy of social media platforms on student RN learning.

Two reviews related to problem-based learning.^{10,85} A qualitative systematic review included eight studies from Australia (2), Thailand (2), and one each from Canada, South Africa, Turkey and the UK.⁸⁵ The review reported that the two key ingredients to using problem-based learning in student RN education is to encourage students to self-regulate their own learning and to learn within a social environment. A second review on the application of questioning in problem-based learning is reported in Table 7.¹⁰

Three reviews focused on peer-learning, meaning learning from one's peers.⁷⁴⁻⁷⁶ An integrative review of 'near-peer' learning included ten studies from the US (3), Australia (2), UK (3), and one each from Norway and Hong Kong.⁷⁴ The review did not clearly define the term 'near-peer' learning, and the term appeared to refer to the use of student RNs in either the same year or one year above the peers (other student RNs) that they are teaching. The lack of clarity in language relating to peer-teaching has been previously highlighted as a concern.⁷⁶ Where reported, the focus of skills taught through near-peer learning were clinical skills, in clinical laboratory settings. The preparation for the near-peer role varied considerably, with one study reporting a two-day training package and another a three-hour orientation session. A comparison of student learning between faculty teaching and near-peer teaching was assessed

in two of the studies. Using a skills checklist to assess student performance, only one study reported an increase in the performance of learners. The authors of the review speculated that in the other study, the students had already received some education on the topic being taught through near-peer learning and therefore an increase in learning was less likely.⁷⁴ The benefits of peer learning were an increase in confidence and knowledge for the near-peer tutor. The shared language between the peer and student RN was perceived as a benefit, as was the use of shared language in facilitating student engagement.⁷⁴

A systematic review of peer-learning included 18 studies, eight of which focused exclusively on peer-learning and the remainder on peer learning as part of another approach to learning such as problem-based learning or enquiry-based learning.⁷⁶ Similar to the other two reviews on peer-learning,^{74,75} the benefits of increased confidence for both students and peer tutors was evident. The review identified the use of peer-learning to teach ethics, critical thinking and the management of emotional situations, indicating the flexibility of peer-learning beyond the teaching of clinical skills. One of the studies reported an increase in student RNs cognitive and motor skills.⁷⁶

Four included reviews focused on the use of online learning delivery.^{77,78,86,87} A systematic review by Kang and Seomun⁷⁷ included 11 studies, six of student RNs and the remainder of RNs, sample sizes ranged from 24-92 and the intervention period from two to eight weeks. Three of the studies were blended learning and the remainder web-based, although it was unclear how many of the blended related to student RNs. The studies related to student RNs demonstrated a positive effect size across the results for knowledge acquisition, indicating that web-based learning can be a useful mode of delivery, particularly due to its flexibility. These findings are supported by other studies (Table 7).⁷⁸ Two reviews^{86,87} focused on the use of mobile devices to facilitate learning. A narrative review of 50 studies indicated the use of podcasts, social media and eportfolios as well as online assessments in student RN education.⁸⁷ The heterogeneity of the studies and the absence of experimental design prohibited firm conclusions, yet the authors identified that the use of online resources was not inferior to other methods of learning. These findings are supported by findings from other studies (Table 7).⁸⁶

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Table 7 Sample of included reviews related to approaches to teaching and learning and education for student registered nurses

Approach to teaching and learning	Description of the review/included studies	Findings
Blended learning	Investigation of blended learning video resources to teach health students clinical skills: an integrative review. ⁸³ Designed to explore whether blended learning resources using video simulation enable interactive teaching of clinical skills to health students. Six of the ten studies related to student RNs, UK (2), Australia (1), US (1), Ireland (1), Korea (1).	Three themes were identified (1) linking theory to practice; (2) autonomy of learning; (3) challenges of developing a blended learning model. Authors conclude that there is evidence to suggest that a blended learning model using online video resources can be helpful in the development of clinical skills.
Blended learning	A systematic review evaluating the impact of online or blended learning vs. face-to-face learning of clinical skills in undergraduate nurse education. 19 papers UK (6) US (4) Thailand (3) Korea (2) Australia (2) Norway (1), Turkey (1). ⁸⁴	Online learning had a similar, and perhaps slightly improved capacity to benefit students' skills and knowledge. The impact on skills performance was higher when compared to traditional learning methods. The benefit of online learning is capacity to return and repeat the learning at one's own convenience.
Multiple techniques	Meaningful and engaging teaching techniques for student RNs: A literature review. ⁷⁹ Review formed part of a larger study to develop a compendium of teaching techniques. Aimed to explore methods of teaching that are meaningful and engaging for student RNs. Fifty five articles included, countries of origin not stated in the article.	Articles focused on technology and online teaching (10), simulation (11), gaming techniques (2), art-teaching techniques (10), narrative-teaching techniques (10), problem-based teaching (8), reflection (5). The authors conclude that student RNs need to be taught in a way that emphasises the practical use of the information so they can become engaged with the content.
Multiple techniques	Education of student RNs – a systematic literature review. ⁸¹ An exploration of which teaching strategies provide the best learning experience and outcome. Studies included US (25) UK (5) Norway (6) Australia (3) Sweden (2) Ireland (1).	Multiple approaches to learning, skills and simulation laboratories provide a positive learning environment. Integration of classroom teaching and clinical practice is important. Stimulating critical thinking in both classroom and skills laboratories is an important strategy of teaching.
Problem-based learning	How does questioning influence nursing students' clinical reasoning in problem-based learning? A scoping review. ¹⁰ An exploration of what is known about the influence of questioning on student clinical reasoning in nurse education. Studies included Australia (2), Canada (2) US (12), Finland (1) Pakistan (1) South Korea (1).	Five themes were reported from the data, (1) critical thinking; (2) nature of questions; (3) effect of high-level questions on critical thinking; (4) beyond the nature of questions asked; (5) questioning and problem-based learning. More empirical evidence is required to gain a comprehensive understanding of questioning as a learning strategy in problem-based learning to promote clinical reasoning.

Approach to teaching and learning	Description of the review/included studies	Findings
Peer-learning	A systematic review of qualitative studies exploring peer learning experiences of undergraduate nursing students. ⁷⁵ To identify and synthesise qualitative evidence of peer-learning experiences in student RNs. Studies included Canada (1) UK (2) Hong Kong (1) Iran (1) South Korea (1). Focus groups and interviews were the main data collection methods.	Peer-learning facilitated personal development and socialisation of students, and in some cases led to emotional support, it enhanced self-confidence and communication skills. Peer learning can take place in laboratory and classroom settings.
Online learning	E-learning and nursing assessment skills and knowledge – An integrative review. Twenty one studies included US (9) Australia (5) UK (2) Spain (1) China (1) Belgium (1). ⁷⁸	The benefits of online learning were capacity for students to ask questions in a safe environment, self-assessment of learning and self-identification of gaps in learning. Education of students and academic members on using online platforms is essential. Heterogeneity of study designs, contexts and measurement tools means firm conclusions cannot be drawn.
Mobile devices	Use of mobile devices in nursing student–nurse teacher cooperation during the clinical practicum: An integrative review. 11 studies (9 relating to student RNs) Taiwan (3) Australia (2) Canada (2) UK (1) NZ (1). Devices were either students own (3) or loaned. ⁸⁶	Mobile devices were used to access e-portfolios, discussion forums and used for texting and social media applications. Practical difficulties of screen size too small, connectivity issues and unable to use devices on clinical practicum. Advantages included enhanced feelings of support, flexibility and the devices were well accepted.

4.2.2 Australian literature

There were 28 studies identified that related to approaches to learning and skill development of student RNs. A broad range of topics were covered with a mixed level of rigour.

Unsurprisingly, no randomised controlled trials were identified, although there were several well designed quantitative studies. Most studies were either mixed-methods or qualitative research. Studies on approaches to learning related to, online teaching and learning methods (n=11), the development of curriculum/ content/ development,^{25,90-94} flipped classrooms,^{95,96} learning styles,⁹⁷⁻⁹⁹ peer learning,¹⁰⁰⁻¹⁰³ and teaching clinical skills to students from culturally and linguistically diverse (CALD) backgrounds,^{104,105} student satisfaction with course material,^{106,107} blended learning,¹⁰⁸ and reflection.¹⁰⁹ Studies not discussed below are provided in Table 8.

The use of online teaching and learning was the most common focus in the Australian literature and indicated the willingness of education providers to engage with a range of technologies to improve student learning experiences and outcomes:

- Placing teaching and learning resources online for students to access, such as video-captured lectures and case-study material.^{110,111}
- Enhancement of face-to-face learning using online simulations.^{112,113}
- Simulated learning environments to support case-based learning to support students for clinical placements.¹¹⁴
- Web-based virtual classrooms that simulate face-to-face discussions between students and tutors.¹¹⁵
- Social-media technology such as Facebook as an adjunct to on-campus course delivery to determine its impact as a learning strategy for improving confidence in clinical skill development.¹¹⁶
- Online compassion module.¹¹⁷
- Comparison of interactive video-based vs. traditional instructor-led basic life support training.¹¹⁸
- Development of non-technical skills through virtual reality online education.¹¹⁹

The use of online technology to prepare for clinical placements was explored in several studies.^{112-114,120} Two studies modelled the use of an online intravenous pump.^{112,113} The online intravenous pump emulator was modelled on actual pumps used in clinical healthcare settings. First-year student RNs (n=179) were assigned to one of three groups, including an online simulation-only group, an on-campus training-only group and an on-campus and online-training combined group. The authors used a mixed-methods, quasi-experimental design to evaluate student-learning outcomes. Combined on-campus and online-learning approaches were seen to significantly improve learning outcomes.^{112,113}

Another study¹¹⁴ that used online technology to prepare student RNs for clinical placements evaluated (survey 1, n=379, survey 2, n= 197) an online simulated learning environment called CaseWorld, that supports case-based learning. CaseWorld provides authentic patient case studies in which student RNs are required to apply critical decision making and reasoning skills,

drawing on available resources. The results were largely formative, reporting on student satisfaction and engagement with the resource rather than student learning outcomes; 86% of students perceived that the resources in CaseWorld benefited their learning. Whilst the technology was designed to prepare students for clinical placements, student RNs predominantly used the technology to prepare for tutorials and assignments. One participant reported that:

CaseWorld supported my learning by giving real examples allowing me to link the different concepts involved.^{114, p 570}

In their study, Johnston and colleagues¹¹⁰ examined the use of online-study materials by students. A quasi-experimental comparison was undertaken, in which one group was provided access to streaming of live lectures (n=211) and the other received only the live lecture (n=288). Student feedback indicated overwhelming support for recorded lectures, with 96% of students accessing the recorded lectures. However, there was only a weak relationship between access of recorded lectures and overall course performance. The students who had access to the recorded lectures demonstrated significantly poorer overall academic performance ($p < 0.001$). Therefore, whilst the recorded lectures were popular, they were associated with poorer academic performance. To explain this phenomenon the authors analysed the student RNs patterns of access to the recorded lectures. The distribution of student RNs access to the recorded lectures identified a peak in the week prior to examinations indicating the use of the recordings in supporting revision.¹¹⁰ The authors suggest that:

...qualitative feedback, coupled with recognition of poor lecture attendance at the campus where digitally recorded lectures were offered could also suggest that these immediate pre-exam periods may actually reflect the first engagement of some students with the lecture material content.^{110, p 45}

This study did not control for student demographics, other academic input or past academic performance.¹¹⁰ These data suggest that provision of recorded lectures without requirement to attend face-to-face may adversely impact student performance and caution should be applied in how online material is incorporated into course work.

Curriculum design was explored in four studies,^{91,93,94,107} and two of these reported concerns regarding inconsistencies in the delivery of educational content related to intellectual disability⁹⁴ and mental health.⁹¹ Interviews (n=31) with pre-registration program coordinators were used to identify intellectual content within their nursing programs,⁹⁴ and 52% of participating schools offered no intellectual disability content. Of those that did (n=15), an online survey identified that content relating to intellectual disability was taught for an average of 3.6 hours per unit of study.⁹⁴ An exploratory study in which nine heads of Schools of Nursing in Queensland were interviewed, identified variation and inconsistency in the inclusion of mental health content between the courses.⁹¹ All study participants agreed that current programs were not ideal in preparing student RNs for practice in mental health. Variation in programs across Australia were noted. Participants commented:

We're increasingly pressured to increase this content, that content, to cover everything in a three-year program....^{91, p 332}

Is there room for more [mental health nursing content? Well, perhaps there is, but as you also want to appreciate, if we put more in, then it also has to come out. So I tend to take the view that the purpose of the BN is to prepare students for entry into practice; it's not to prepare them to become a mental health nurse, which will be a different beast altogether.^{91, p 332}

The challenge of obtaining specialist mental health academic staff was also identified as a constraint and the quality of placements available:

So you've got a mental health service in the midst of uproar ... And obviously, that has an impact on the quality and quantity of placements.^{91, p 332}

The same authors undertook a qualitative exploratory study of barriers to the implementation of majors subjects in mental health in student RN educational preparation.⁹² At the time of the study, eleven universities in Australia were offering majors in mental health. Of these, ten were represented in the study and the main barriers were securing clinical placements and resistance from non-mental health nursing academic counterparts. There were mixed views regarding availability of clinical placements, participants reported not being able to access quality placements for their students. One participant offered an alternative perspective:

Mental health (services) know that these people are doing an advanced programme, so they're very happy to take them, but having said that, all of our undergraduate students have to have two compulsory placements in mental health, and they all get them. So this notion about, oh we can't find clinical placements, if it's compulsory, the clinical office just have to find them, that's all there is to it. . . . None of this . . . let's pretend this surgical unit is mental health.^{92, p 437}

The study reported that six of the eleven universities have since stopped providing majors in mental health nursing.⁹²

Peer-learning appeared to be a popular student-centred approach to student teaching and learning, especially in situations where there are large cohorts of students that do not allow for individual attention from academics.^{100,102} An investigation of the value of peer-to-peer learning by Curtis and colleagues¹⁰⁰ reported that the approach was engaging for students, but the post-test only study design did not allow for observations about whether enhanced learning occurred due to peer involvement. A qualitative study of a combined peer and online learning approach to teach pharmacology to second year student RNs (n=35) at a rural university¹⁰³ identified mixed responses to the online component. Students were allocated to a peer-learning group of six students and face-to-face tutorials were replaced with online sessions. Students were able to interact online, reflect, and complete assessment tasks. The majority of participants liked the online tutorials (n=23) and perceived that it helped their learning, and 11 participants disliked the online component. The main benefits of the online delivery were the flexibility and convenience afforded by this approach. The disadvantages included issues with information technology systems and the absence of immediate feedback, both of which were associated with an increase in student stress.

Australia has an increasing number of students from CALD backgrounds who may experience language and communication difficulties.¹⁰⁴ A study that focussed on student RNs from CALD

backgrounds used an action research–based approach, and they interviewed eight third year student RNs.¹⁰⁴ Analysis of the interview data identified four educational strategies that can potentially support international students including: English language programs during semester breaks, International English Language Testing System (IELTS) exam strategies, increased use of nurse specific language in English language support programs and informing lecturers of the impact of teaching styles on CALD students.¹⁰⁴

A study by Mitchell and colleagues¹⁰⁵ qualitatively explored the challenges to learning for international students. Findings indicate that international nursing students need to find supportive opportunities to speak English and develop proficiency. Stress was reported as a concern by the students, because it negatively affected their capacity to communicate, particularly in the clinical environment.¹⁰⁵ The incorporation of strategies to assist CALD students was an important aspect of their educational preparation.

One study¹⁰⁶ focused on student satisfaction. Whilst not a marker of learning, student satisfaction is important as it potentially enhances student engagement thereby facilitating learning. From an online survey (n=530), Milton-Wilkey and colleagues¹⁰⁶ reported that student dissatisfaction with learning may lead to attrition during the nursing program and career changes soon after graduation. The study reported an overall decline in satisfaction as students progressed through their nursing program. A key area of dissatisfaction appeared to be the quantity and quality of clinical experience, suggesting that the integration of theory and skill development was an important aspect in retaining students, as was their enjoyment of their clinical experiences.¹⁰⁶

Table 8 Sample of Australian papers on approaches to learning

Approach to teaching & learning	Description of study	Findings
Blended	Shifting the load: Improving bioscience performance in undergraduate nurses through student-focused learning. Three interventions were assessed: Bioscience workshop, Human Body Club and LearnSmart, in relation to student RN performance in a bioscience unit. ¹⁰⁸	Completion of high school biology was not, on its own, a predictor of success in the bioscience nursing unit. Participating in the bioscience workshop did not significantly effect marks or failure rates. Participation in the Human Body Club did increase performance. A student's mark improved by 0.020 for every minute spent on LearnSmart.
CALD	Investigating the language needs of culturally and linguistically diverse nursing students to assist their completion of the Bachelor of Nursing programme to become safe and effective practitioners. ¹⁰⁴ Action research study, semi-structured interviews with student RNs (n=8) from CALD backgrounds.	Four strategies for improving English language skills were identified: (1) English language support programme to be conducted during semester breaks, (2) ongoing focus on reading and writing but also to include some International English Language Testing System exam strategies and practice, (3) increase the use of nursing specific language and context in the English-language support programme, and (4) informing or reminding lecturers of the impact of their lecture delivery style on learning for students from diverse backgrounds.
Curriculum content	The nursification of a bioscience unit and its impact on student satisfaction and learning in an undergraduate nursing degree. Comparison of unit evaluation scores pre (n=196) introduction and post (n=219) introduction of the unit. ¹⁰⁷	There was no significant difference in satisfaction between the two cohorts. Student motivation to learn was lower in the pre-cohort as was their ability to learn, indicating that the nursification of the bioscience unit facilitated student learning.
Curriculum design/content	The impact of timetable changes on student achievement and learning experiences. ⁹³ Mixed-methods study, second year Bachelor student RNs (n=84) completed a questionnaire about their learning practices and experiences; student grades were obtained from official university records.	The academic achievement of students' learning under the condensed class schedule was approximately 7.5% lower than that achieved by cohorts prior to the timetable changes. This resulted in an additional 9% of the cohort failing the subject compared to previous cohorts. Many students reported that they did not prepare adequately for classes and that their learning experiences were negatively impacted by the condensed class timetable.
Curriculum content	Intellectual disability health content within nursing curriculum: An audit of what our future nurses are taught. ⁹⁴ To establish the quantity and nature of intellectual disability content offered within Australian nursing degree curricula, a two-phase national audit of nursing curriculum content was conducted using an interview and online survey (n=15).	Over half (52%) of the schools offered no intellectual disability content. Clinical assessment skills, ethics and legal issues were most frequently taught, while human rights issues and preventative health were poorly represented. Only one nursing school involved a person with intellectual disability in content development or delivery. There is considerable variability in the teaching of key intellectual disability content, with many gaps evident.

Approach to teaching & learning	Description of study	Findings
Flipped classroom	Surveying the experiences and perceptions of undergraduate nursing students of a flipped classroom approach to increase understanding of drug science and its application to clinical practice. Pre (n=26), post (n=25) questionnaire second year student RNs. ^{95,96}	The students who watched the eLecture prior to workshop attendance perceived enhanced understanding and critical thinking skills. Students who had conflicting family or personal commitments were constrained by time and the need to listen to the eLecture prior to the workshop was a significant challenge for them.
Flipped classroom	Making the most of person-centred education by integrating flipped and simulated teaching: An exploratory study. First-year nursing students, online survey (n=153), focus groups (n=10) with tutors (n=4). ^{95,96}	Students perceived that the unit motivated them to achieve their learning outcomes and that the resources and content of the course facilitated these outcomes. There was a statistically significant increase in student satisfaction when compared with survey results prior to introduction of the flipped approach.
Peer-learning	Snaps+: Peer-to-peer and academic support in developing clinical skills excellence in under-graduate nursing students: An exploratory study. ¹⁰¹ Student nurse assisted practice sessions (Snaps) were held for two hours per week over 13 weeks. First-year (n=18) and second year (n=29) student RNs completed a questionnaire to evaluate Snaps' effectiveness.	The presence of a nurse academic at the peer support teaching sessions was effective in improving student confidence and practice of the skills being taught. Students reported feeling supported and feeling able and competent to undertake essential nursing skills. The popularity of the Snaps sessions meant that overcrowding was an issue. The sessions were attended by first and second year student RNs and students reported that this was sometimes in choosing the pitch and content of the delivery of sessions to suit all learners.
Reflective practice	Learning and assessing competence in reflective practice: Student evaluation of the relative value of aspects of an integrated, interactive reflective practice syllabus. First-year student RNs (n=163) evaluated an online reflective module that they undertook to complement their clinical placement. ¹⁰⁹	The online package was integrated with Lasater's Clinical Judgement rubric and Tanner's Clinical Judgement model and 69% of students perceived that Lasater's rubric helped clarify their expectations and 55.8% perceived Tanner's model helped with their writing. Most valuable aspect of the online module was the immediate feedback received from the academic staff.

4.3 Interprofessional education

4.3.1 International literature

Seven reviews focused specifically on IPE, all published since 2015, indicating that IPE research is receiving increasing interest. The majority of studies included nursing and medical students and less often, non-medical health professionals such as physiotherapists and dentists. Four reviews focused generally on IPE in health student education,¹²¹⁻¹²⁴ and three reviews focused specifically on student RNs.¹²⁵⁻¹²⁷ This literature indicates that IPE as a concept is not yet fully embedded into most educational programs. The concept of IPE remains in its infancy and frameworks, competencies and research in this area are in development.

The included reviews suggest that the main driver for IPE was the improvement of collaboration and teamwork between health professionals.¹²² Many reviews cited grey literature that supports the inclusion of IPE as a vehicle for developing and strengthening the skills of communication, teamwork and collaboration^{123,125} and in the UK, IPE is now a requirement in pre-registration training in health and social care.^{122,124}

The types of IPE activities reported in the reviews included, simulated training wards,¹²² health-screening programs in underserved, rural or aged care groups,¹²³ clinics,¹²³ clinical placements,¹²⁵ and simulation activities.¹²⁶ Across the reviews, the majority of participants were nursing and medical students.¹²⁵ Less frequently reported was the participation of non-medical health professionals such as physiotherapists, radiographers and dentists.¹²⁵ Integration of IPE across educational programs varied considerably.¹²² IPE was often used as an individual activity rather than embedded longitudinally through programs.¹²² The length of time of IPE activities differed, some activities such as student-led training wards ran for two to three weeks, whereas activities involving patient simulations lasted for a day or less.¹²²

IPE appears to be a fringe activity to student RN education programs.^{123,125} The key barriers to IPE include the challenge of timetabling students from various disciplines so that they are available at the same time to participate in IPE activities, the mismatch in cohort sizes across disciplines and the fact that most IPE activities were voluntary and did not form part of the assessed curriculum.^{122,123,128} The conduct of IPE activities was reported as costly in terms of time and money, particularly if it involved simulation.¹²²

Outcome measures in the reviews of IPE that focused generally on health students reported an increase in student perceptions of their abilities and knowledge,¹²² pre and post-IPE measures of knowledge or attitude,¹²² and change in knowledge of the roles of other disciplines.¹²³ Labrague and colleagues¹²⁶ identified a lack of randomised controlled trials evaluating IPE, concluding that it was challenging to attribute any outcomes to IPE specifically. Nonetheless, the majority of reviews reported studies in which students highly valued IPE as a strategy for building collaboration, teamwork and communication skills and confidence.¹²¹ Student attitudes to collaboration and clinical decision-making were also noted to potentially be enhanced by IPE. The reviews relating specifically to student RNs reported similar findings with an increase in perceived communication and teamwork skills,¹²⁵⁻¹²⁷ and understanding of the roles of other health professionals and different perspectives.¹²⁵⁻¹²⁷

The maturity of IPE appears currently limited. Examples of IPE frameworks and competencies to support the delivery of IPE reported in the reviews have been summarised in Table 9. There are a broad variety of IPE assessment tools, scales and questionnaires. The most commonly-used validated tools across the studies in the included reviews were the *Readiness for Interprofessional Learning Scale* (RIPLS)¹²⁹, *Interprofessional Education Perception Scale* (IEPS)¹³⁰ and the *Kirkpatrick Evaluation Framework*.¹²⁷

Table 9 Examples of IPE and educational frameworks reported in the reviews

Framework	Description
Canadian Interprofessional Health Collaborative. ¹³¹	Competencies for interprofessional communication, role clarification, team functioning, collaborative leadership and conflict resolution.
Interprofessional Education Collaborative. ¹³²	Four competencies: values/ethics, roles/responsibilities, communication and teamwork.
Nursing Education Simulation Framework. ¹³³	Comprises five constructs: student, teacher, educational practices, simulation design characteristics, outcomes.
Technology Enhanced Learning Framework. ¹³⁴	Aim is for improved patient outcomes, safety and experience. Technology framework must focus on equipping the workforce with the necessary skills for safe and effective patient care, ensure equity of access and quality provision, deliver value for money, deliver high quality educational outcomes, innovative and evidence based educationally coherent.
Kirkpatrick Evaluation Framework	(1) Reaction - Learners' views on the learning experience and its interprofessional nature; (2a) Modification of attitudes/perceptions - Changes in reciprocal attitudes or perceptions between participant groups. Changes in perception or attitude towards the value and/or use of team approaches to caring for a specific client group. (2b) Acquisition of knowledge/skills - Including knowledge and skills linked to interprofessional collaboration. (3) Behavioural change - identifies individuals' transfer of interprofessional learning to their practice setting and changed professional practice. (4a) Change in organisational practice - wider changes in the organisation and delivery of care. (4b) Benefits to patients/clients - improvements in health or well-being of patients/clients. ¹²⁷

4.3.2 Australian literature

Five Australian studies on IPE were identified and they provide a mixed perspective. Three studies related to IPE during clinical placements¹³⁵⁻¹³⁷ and three relate to on-campus IPE activities.¹³⁶⁻¹³⁸ All studies were based on the assumption that collaboration between health professionals is an important aspect of practice and that IPE activities are now an expected component of health professional education to facilitate the development of teamwork, communication and collaboration skills.

The studies on clinical placement related to student preparedness for IPE,¹³⁵ and student experience¹³⁹ and perceptions of IPE clinical placements.¹⁴⁰ Grace and colleagues¹³⁵ adapted an online module called *Better Prepared Better Placement* to suit an interprofessional audience. The module aimed to facilitate communication between students and clinical facilitators prior to attending an IPE clinical placement. Data gathered through an electronic survey and focus groups with facilitators (n=6, 2 from nursing) and students from nursing (6/16), osteopathy, pharmacy, and naturopathy identified that the tool helped them prepare and reduced the stress they would have otherwise experienced in relation to that placement.¹³⁵ In the presentation of results it was difficult to isolate the results relating to nursing students from

those relating to the other health professionals. Therefore the generalisability of these results to student RNs is unknown.

In their study, Walker and colleagues¹³⁹ explored IPE opportunities whilst on a rural clinical placement. Sixty students from non-medical health roles (n=18), medicine (n=18), nursing and midwifery (n=24) were surveyed using the RIPLS and the IEPS, and provided qualitative data through interviews and focus groups. A broad variety of opportunities for collaboration on rural placements were identified, including informal interprofessional group discussions about case studies, and working with members of the multidisciplinary team. None of the IPE activities were compulsory and whilst the students engaged willingly with IPE they did not always value their experiences or take up all of the opportunities available. The structure of the IPE activities varied with only 23% (n=14) having the opportunity to debrief. There were no statistically significant differences for the RIPLS subscales in any discipline.¹³⁹

A pilot of a two-week student led ward placement in an emergency department and rehabilitation settings investigated the IPE experiences of medical (n=18) and nursing (n=18) students.¹⁴¹ All students perceived the placement as interesting and valuable. All students perceived a sense of belonging to their placement and that the placement helped them to understand their discipline and role more fully.¹⁴¹

The two studies that explored on-campus IPE experiences focused on a simulation experience¹³⁸ and a workshop on falls assessment.¹³⁷ One study evaluated the impact of an IPE simulation of a birth in a non-maternity setting, in which paramedics (n=10) student RNs (n=10) and midwifery students (n=4) worked in groups of five to manage the birth.¹³⁸ The study administered the *Self Efficacy for Interprofessional Experiential Learning Scale* prior to the simulation, one month and then three months after the simulation. The study also administered the *Satisfaction with Simulation Experience Survey* after the simulation debriefing. Student satisfaction was high in all student disciplines, with significant improvements in interprofessional interaction and team evaluation, the student RNs were the only discipline to reflect a growth in knowledge.¹³⁸

Kent and colleagues¹³⁷ compared an online falls risk assessment module with a two-hour IPE workshop on the same topic. Students from dietetics, medicine, nursing, occupational therapy, pharmacy, physiotherapy, podiatry, social work attended the workshop (n=43) and seven students completed the online falls module. It was unclear how many of the students were student RNs. All students completed a ten-item multiple choice quiz relating to falls risk assessment and an evaluation of the educational experience. While participants in the IPE group were positive about their experiences and they perceived that the workshop afforded them the opportunity to collaborate with students from other health disciplines, there was no difference in the learning outcomes between the groups.¹³⁷

The sample sizes and the proportion of nursing students in most of the studies was low and the variation in the quality of the study designs limits the generalisability of the findings and the capacity to make firm recommendations. However, students' enjoyment of IPE activities and its potential to impact on student attitude towards collaboration, teamwork and communication skills was a common feature of included studies. There were no longitudinal studies identified and therefore it is unclear to what extent any benefits of IPE are translated into clinical practice.

4.4 Assessment of learning

4.4.1 International literature

Ten reviews focused on methods of assessment. The types of assessments included are Objective Structured Clinical Examinations (OSCE),¹⁴²⁻¹⁴⁵ reviews that explore multiple approaches to assessment,¹⁴⁶⁻¹⁴⁸ open and closed book examinations,¹⁴⁹ and short answer questions.¹⁴³ One review reported the existence of the concept of 'failure to fail' student RNs in their assessments.¹⁵⁰

Whilst some studies were focused on the assessment of specific skills, a thread throughout the other reviews was the assessment of critical thinking skills^{149,151} and the capacity for students to apply their knowledge to clinical practice.^{146,147} Consistency in assessment criteria was reported as being extremely important, as was consistency in feedback and guidance.^{144,145} The application of assessment tools to guide assessment and feedback can be advantageous in reducing inconsistency.¹⁴⁸

The reviews that focused on OSCEs related to the assessment of both clinical skills performance, such as medication administration, documentation¹⁴⁴ and non-technical skills such as communication.¹⁴² The OSCE was originally designed to be undertaken through a series of assessment stations that assessed different aspects of performance. Active stations are designed to be hands-on and involve a student performing a task or an assessment and a standardised patient or a patient actor, may be used to role play a patient.¹⁴⁴ Passive stations are theoretical assessments, that can involve assessment of medication calculations or interpretation of clinical investigations. Objective models of clinical assessment are designed to reduce the disparity and inconsistency in assessment.^{144,145}

From the available literature, OSCEs appear to be an effective assessment process in terms of their consistency and capacity to identify students' strengths and weaknesses.^{144,145} The reported limitations of OSCEs included the time and cost of undertaking them^{144,145} and the stress experienced by students undertaking them.¹⁴⁵ Despite these limitations, OSCEs were reported as a fair and valid assessment strategy that helped students prepare for clinical practice.^{142,145,146}

One review focused specifically on the process of failing students.¹⁵⁰ The papers in this review emanated from Canada (n=8), the UK (n=7) and the US (n=6). In several of the included studies, the act of failing a student was regarded as an emotional process for the assessor and resulted in significant emotional consequences for both the assessor and student.¹⁵⁰ Concern was raised that assessors give students the benefit of the doubt, and bias their assessment in relation to student characteristics, such as the 'student nurse is nice'.¹⁵⁰ One of the main reasons for assessors discomfort in failing students was a perceived lack of support from the university.¹⁵⁰

Amongst the included reviews, multiple clinical skill assessment tools were identified. These related predominantly to assessment of clinical competence,¹⁴⁸ specific clinical skills,¹⁴⁸ and non-technical skills, such as empathy and teamwork and communication.¹⁴⁷ Many of these tools were evaluated as being reliable and valid, yet there was also evidence of the use of faculty-generated untested tools.¹⁵² The tools to assess non-technical skills were tested in very

specific contexts and therefore it is difficult to understand how effectively these tools could be transferred to other contexts.¹⁴⁷

4.4.2 Australian literature

Four Australian studies focused on the assessment of student RNs. This was less than perhaps anticipated given the twelve reviews identified on this topic. One study focused on, stringency of assessment,¹⁵³ and three focused on the application of the OSCE to assess students' performance of clinical skills.¹⁵⁴⁻¹⁵⁶ East and colleagues,¹⁵⁴ investigated the perspectives of 25 academics using the OSCE to assess students. Feedback was generally positive but unlike the findings of the international reviews, there were concerns regarding consistency due to the wide variation in pass rates between assessors (16-90%), with the most significant variability being related to assessors who had critical care experience and those who did not (66% vs. 39%). Qualitative responses indicated that, whilst assessors did follow the criteria for the assessment, there were elements that were open to interpretation:

I probably refer more to the clinical experience [rather than criteria], because I see what actually happens out in the real world, in the wards and in the hospital setting. So I know what their expectations are.^{154, p 465}

In another study of academics (n=16) at a rural university¹⁵⁶ there was also variability in student OSCE assessments. Participants indicated that whilst the OSCE is an effective tool to provide feedback and to ensure that student RNs have the skills, knowledge and attributes to undertake their clinical placements, it is a stressful activity for students and the assessments can lack consistency:

Another concern raised by the participants was that when administering the Objective Structured Clinical Assessments and assessing students, an assumption is made that what we are doing is correct. This becomes complicated when there is more than one way of completing a procedure...^{156, p 99}

To improve student performance in the OSCE and reduce student stress, Massey and colleagues¹⁵⁵ trialled an online preparatory tool, which provided information and a demonstration of an OSCE assessment. This online tool was perceived as effective by students.

In their study, Daly and colleagues¹⁵³ reviewed 2339 graded skills assessments to explore academic leniency in clinical assessments. Assessors who had graded 20 or more students were included in the analysis, 80% of these were casual staff. The pass rate was 80% for the assessment. The variability in grades identified in the study was fairly small, ranging from 74-85%. Australian-born students had a pass rate of 85%, compared to 78% for students who were born overseas. The pass rate of assessors ranged from 36-100% which is significant and indicates inconsistency in the application of the assessment criteria between assessors. The assessors themselves were consistent in their grading, and the authors termed them 'hawks' and 'doves' in relation to how consistently stringent or lenient the assessors were, respectively. The casual academics demonstrated the most extreme grading in terms of stringency and leniency.¹⁵³ The authors comment:

The significant difference in pass grades allocated by the lenient ‘dove’ assessors — almost eight times more likely to allocate a pass grade than the most stringent ‘hawk’ assessors is a worrying finding.^{153, p 453}

4.5 Clinical placements

4.5.1 International literature

Eleven international reviews focused on clinical placements. In addition, one review of Australian studies was identified and is discussed below with the Australian primary studies. Five of the reviews dealt with the issue of assessment of student performance on placement¹⁵⁷⁻¹⁶¹ and for continuity and context, these are discussed here rather than in the previous section on assessment of learning. Two reviews explored the optimal approaches to clinical practicum education.^{158,162} It was apparent from the literature that in recent years there has been a re-vitalised academic and educational interest in clinical placements and their impact on student learning. This is largely in response to the global demand for graduate nurses to replace the ageing workforce, which has meant an increase in cohort sizes in some countries, coupled with the challenges of sourcing sufficient high-quality placements. There was widespread agreement across the included reviews that clinical placements were an essential component of the educational preparation of RNs. An overview of the included reviews is provided in Table 10.

Perhaps one of the most comprehensive of the included reviews is reported by Forber and colleagues,¹⁶² which included 18 primary studies comparing various methods and design of clinical placements. This review included studies from Australia (n=7), US (n=4), Europe (n=5), Iran (n=1) and Saudi Arabia (n=1). Whilst these studies adopted various designs they frequently explored student self-reported experiences or perceptions. Five of the studies used the Clinical Learning Environment Inventory (CLEI), a validated tool designed to measure students’ perception of the individualisation of placements, the innovation, satisfaction, involvement, personalisation and task orientation. Four studies used the Clinical Learning Environment Inventory Nurse Teacher (CLEI+T) which also includes the dimension of nurse teaching in clinical practice. The duration of placements in the studies ranged from 32 hours to 42 weeks and were undertaken in various clinical settings. The models of clinical placements in the studies were:

- The traditional model - students undertake a block placement, buddied with an RN whilst working in a clinical setting, and supervised by some form of mentor from the university.
- The preceptorship model - each student is allocated a facility-employed RN to support them throughout the placement.
- The collaborative model – education and industry collaboration in which placements occur in one healthcare organisation and all staff engage in education and support of the students.
- Hub-and-spoke model – students are allocated to a ‘hub’ location, from which they can experience other areas of a health service (‘spokes’) to learn about the full scope of a patient’s journey.¹⁶²

Irrespective of the placement model, Forber, DiGiacomo¹⁶² identified several key themes. A prominent theme was the central role of interpersonal relationships, in particular the quality of the supervisory relationship between student and facilitator, this included the ward RNs

(preceptor) with which the students were buddied during their shifts and the facilitators who more commonly coordinated the placement and organised students' assessment. This finding was supported by several included studies which identified the benefits of the supervising RN and facilitator creating a welcoming, friendly, and positive environment for the student. The second most prominent theme was the consistency and continuity in education delivery and its impact on student centredness and student satisfaction.¹⁶² Students in rotational placements, for example, reported significant disruption on starting each new component of the placement, as if they were starting again:

...students in a traditional rotational model, describing 'going backwards' or starting again as they moved through placements. Disrupted continuity resulting from multiple supervisors can be a notable cause for student dissatisfaction.^{162, p 90}

One of the main relational components of student satisfaction on clinical placements was professional relationships and need for consistency and continuity:

This review found that regardless of the model of clinical education or supervision there are factors which transcend the 'models' and contextual constraints. These were the centrality of professional relationships, need for consistency and continuity in clinical education delivery, the opportunity for varied clinical education/supervision models and ensuring the viability of the model to function as designed.^{162, p 90}

The importance of the university or hospital-based facilitator and preceptor ward RN were highlighted as a key theme in other reviews relating to clinical placements:

- 'From our literature review, it appears that a key strategy in the placement of students in nursing homes involves the ability of the educator to provide mentoring'.¹⁶³
- '... preceptors are consistently reported as feeling unprepared to act in this pivotal role'.¹⁶⁴
- 'The students identified important areas that the mentors did not address, such as introducing the students to the nursing home setting, familiarising them with the surroundings, explaining health and safety issues'.¹⁶⁵
- '... there was a correlation between the participants rating of their mentor and their rating of their overall clinical experience indicating the importance of the mentor within this context [primary care]'.²⁴
- 'However, mentorship emerged from the literature as being variable, despite mentor relationships being seen as key to the quality of learning'.^{23,24}

The role of the supervising facilitator and preceptor was specifically examined in a narrative review of 23 studies.¹⁶⁶ This review highlighted the importance of educating the facilitator/preceptor to ensure they understand the requirements of student performance on the placement and their role in assessment. The clinical placement assessment was perceived as a stressful activity for students and therefore, receiving an effective orientation at the start of the placement, being observed by their facilitator/preceptor for adequate time to inform the assessment, and receiving feedback, were all seen as important factors. Inconsistencies in feedback were identified across the included studies, as was the challenge of failing students. Indeed the included study reported by Yonge and colleagues¹⁶⁷ described how some mentors

believed it was not their role to fail students. Two other studies^{168,169} reported that assessors did not have the courage to fail students and that it is more likely that students will fail an academic assignment than a clinical placement.¹⁶⁶

The concept of 'failure to fail' was also raised in a systematic review that sought to explore the adverse health events related to clinical placement.¹⁷⁰ One of the included studies referred to:

...a trend of 'failure to fail'...marginal students among clinical supervisors [facilitator/preceptor] in fields across healthcare, leaving students at risk of graduating without achieving sufficient clinical competencies.^{170, p 185}

The review included 50 studies, the majority (26) from Australia.¹⁷⁰ The following barriers to competency on clinical placement were cited:

- '...the literature drew attention to student concerns regarding inadequate exposure to hands-on practical learning experiences, potentially stunting professional development.'^{170, p 184}
- '...the distinct educational barriers encountered by students undertaking rural placements, including financial burdens, travel time, lack of administrative support, and limited educational resources...' ^{170, p 185}
- '...limited coverage of crucial competencies such as sexual healthcare...domestic violence...patient safety...' ^{170, p 185}
- '...the recurring problem of placement shortages was documented...' ^{170, p 185}
- 'A fifth factor related to students' risk of placement failure or attrition, raising questions regarding students' workforce readiness...' ^{170, p 185}

Five reviews examined specific placement locations, including: aged /residential care,^{22,163,165} and community and primary care.^{23,24} Students' perceptions of these clinical settings was often initially negative, as student RNs perceive they will learn less compared to acute hospital settings and would therefore prefer acute hospital placements to those in aged / residential care.^{22,163,165} In their review of 24 studies of nursing students' perceptions of aged care, Algosio and colleagues²² concluded that students believed aged care placements were detrimental to their learning and considered personal care to be less valuable than acute care, and technical skills more important than non-technical skills.²² The authors surmised that students' focus on the importance of learning acute care skills was a reflection of the emphasis on acute care in student RN education. These perceptions diminished the longer students were placed in the aged care environment.²² The other two reviews on aged / residential care identified similar findings.

One way of optimising the learning achieved in residential aged care placements was reportedly through well prepared academic clinical partnerships between the clinical setting and the university.^{163,165} Effective facilitation was also important, in terms of providing time with the facilitator and sufficient feedback on clinical performance, as well as assurance that there were enough RNs to preceptor and supervise the students.^{163,165} Residential aged care placements were reportedly positive provided there was adequate and structured informational and faculty support. Aged care facilities were identified as excellent environments to practice communication skills, health assessments and fundamental nursing

care.¹⁶³ The acute care focus of current educational programs, however, may have a bearing on students initial negativity towards placements in chronic care and non-acute care settings such as residential aged care and primary care. Students' perception and enjoyment of primary care appeared to change once exposed to primary care placements, perhaps indicating that students have misunderstandings regarding what these placements can offer.^{23,24}

Table 10 Included international literature on clinical placement

Clinical placement setting	Title/included studies/reference	Key findings
Adverse health events associated with clinical placement	Adverse health events associated with clinical placement: a systematic review. 50 studies, Australia (26), Canada (2), NZ (2), US (5), UK (15), majority of papers related to nursing students. ¹⁷⁰	Twenty one studies reported on the impact of supervision, 17 on the risk of abuse and 21 on barriers to competency. Negative attitude of mentors was reported frequently (7), power imbalances (5), lack of support (6), lack of consistency in supervision (6), inadequate exposure to hands on experience (4). Adverse events included abuse, physical, verbal, sexual harassment, bullying, humiliation.
Aged care settings	Exploring undergraduate nursing students' perceptions of working in aged care settings: a review of the literature. 24 studies, country of origin not stated. ²²	Nursing curricula have an acute-care focus in which emphasis is placed on technical skills rather than non-technical skills of fundamental care delivery. This focus influences students' attitude towards aged care placements and many do not value aged care as an effective learning environment. Students who do experience aged care placements often feel unprepared.
Aged care settings	Placement of undergraduate students in nursing homes: careful consideration versus convenience. 35 studies, 10 research studies, remainder discussion papers and testimonials. ¹⁶³	Resurgence in the use of nursing home placements. Potentially effective for development of communication skills, health assessment and fundamental nursing care. Students would prefer acute care placement; often a lack of RNs to supervise students. Facilitators that lack gerontology expertise/passion can transmit negative messages to students. Ideal is to have a link tutor with expertise in gerontology to link the university to the nursing home setting.
Aged care settings	Status of knowledge on student-learning environments in nursing homes: A mixed-method systematic review. 20 studies, Australia (7) Norway (7) Sweden (2) UK (2) US (2). ¹⁶⁵	Students who had positive earlier experiences and a positive attitude to work in aged care had increased perceptions of learning. Role of the facilitator and staff in the aged care setting are critical to students' enjoyment and perceived satisfaction of the placement. Included studies identified students perceived some facilitators provided insufficient supervision and didn't spend adequate time with them or students perceived they didn't receive sufficient feedback.
Assessment of clinical practice of student RNs	Summative assessment of clinical practice of student RNs: a review of the literature. 23 studies, Australia (2), UK (10), Ireland (6), US (3), Canada (1), Sweden (1). ¹⁶⁶	Mix of quantitative and qualitative designs, students and assessors self-reported perceptions of placements. Multiple themes identified, importance of assessor training, importance of familiarisation of assessment process, ratio of assessors to students, spending enough time with students in practice to assess them fairly, providing appropriate feedback to students on performance, challenge of failing students.
Assessment of clinical practice of student RNs	Exploring mentors' interpretation of terminology and levels of competence when assessing nursing students: An integrative review, 8 studies UK (4) Ireland (4). ¹⁵⁷	Four main themes identified were assessors difficulties interpreting competencies, difficulties distinguishing between different levels of competence and difficulties articulating feedback. Those assessing students clinical performance were often unfamiliar with the practice assessment document (PAD) which contained the competencies set by the Nursing & Midwifery Council, UK.

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Clinical placement setting	Title/included studies/reference	Key findings
Community setting	Enhancing undergraduate community placements: a critical review of current literature. 23 studies, mostly from the UK. ²³	Community placements varied from 1-12 weeks, studies focused on student experiences. Community placements perceived as positive, although students' focus was on developing technical skills rather than non-technical skills. Mentor role was critical to the success of the placement. Lack of preparation of mentors.
Community setting	An integrative literature review of pre-registration nursing students' attitudes and perceptions towards primary healthcare. 11 studies Australia (7) UK (4). ²⁴	Students had capacity to practice a broad range of skills in primary healthcare placements, one study identified limited opportunities to undertake intravenous medication skills. Students perceived increased confidence in communication and clinical reasoning skills from their placement. Attitudes toward primary care were generally negative with student RNs perceiving that acute care was the main focus of nursing, and that acute care environments were the best to consolidate skills because that is where the majority of care is delivered.
International placements	International Experiences in Nursing Education: A Review of the Literature, 23 papers US (8) UK (3) Finland (1) Netherlands (1) International Collaborations (15). ¹⁶⁰	Two international placements were exchanges, the remainder were one way experiences. The aim of the placements across the included studies was to understand different cultures and cultural perspectives and to learn about the host health care system. Barriers to international placements were funding, difficulty of organising them and inherent stress for some students.
Optimal model of clinical education	In pursuit of an optimal model of undergraduate nurse clinical education: an integrative review. 18 studies, Australia (7), US (4), Europe (5) Iran (1), Saudi Arabia (1). ¹⁶²	Primarily explored student experiences or perceptions. Placement duration was 32h to 42 weeks, different placement models (traditional, preceptorship, collaborative, hub and spoke). Irrespective of model, the key factors were (1) the relationship between supervisor and student and (2) the consistency of educational delivery.
Optimal model of clinical education	The effectiveness of clinical education models for undergraduate nursing programs: A systematic review. 9 studies, Australia (5) Norway (1) South Korea (1) Sweden (1) US (1). ¹⁵⁸	Comparison of the evidence on selected facilitation models, the level of evidence was weak and the authors conclude that there is a need for well planned, high quality studies to be undertaken. The evidence available indicated that the clinical education unit (CEU) model provided the highest level of student engagement and enhancement of learning. The CEU are health units developed in partnership between academics and clinicians for the clinical education of student RNs.

4.5.2 Australian literature

Fifty three Australian papers (1 literature review of Australian studies and 52 studies) were identified as relevant to this review. Most of these related to three aspects of clinical placements: student experiences (18), supervision (12), and placement setting (21). In reviewing the studies, an exception was made to the inclusion criteria for Topic 3, in so far as studies relating to RNs were included in the context of their perspectives on student RN supervision because this held relevance to student RN skill development.

4.5.2.1 Student experience

Studies relating to student experience provided insight, from the perspectives of students and supervisors, about the characteristics of positive placement experiences (Table 11). Whilst there are a multitude of factors that appear to impact on a student's clinical placement experience, one of the most significant is the student's perception of the attitude of the clinical staff that they are working with.¹⁷¹⁻¹⁷³ Studies described the impact that the student's sense of belonging and of feeling welcome and well supported had on their satisfaction with the clinical placement.^{172,174,175} Students reportedly held certain expectations of how they would learn on clinical placement and who was responsible for their learning. Two studies identified different perceptions of students, facilitators and ward staff in relation to who is responsible for student learning, with many students believing that ward nurses should provide and direct students to learning opportunities.^{171,172} One of the authors offered the following perspective:

...The responsibility for any student's learning is ultimately the student, and it is no different with clinical learning.^{171, p 31}

Table 11 Characteristics of positive placement experiences

Component	Evidence
Courage to speak up	'... each new clinical placement experience gave them more confidence and allowed them to feel more confident to speak up where before they may have remained silent'. ¹⁷⁶
Staying positive	'Another theme to emerge from the text analysis was being positive, prepared and organized for the first clinical placement'. ¹⁷⁷
Psycho-social culture of the ward	'These results demonstrate that the psycho-social culture of the ward predicted the highest student satisfaction rates ...'. ¹⁷¹
University & industry partnerships	'University educators are encouraged to build strong partnerships with industry partners in order to establish a trusting relationship that fosters a sense of positivity towards students'. ¹⁷¹
Belonging	'A sense of belonging affected the level of questioning and information seeking that students felt they could engage in'. ¹⁷²
Learning opportunities	'Opportunity to develop competence and build confidence was a key feature of successful clinical placements for both students and supervising ward nurses'. ¹⁷²
Relationship between student and facilitator	'Of significance in this study is the intersect between the supervisor and student and how this developing relationship can impact the students' developing sense of professional responsibility'. ¹⁷²

For many students, participating in clinical placements was reported as stressful and overwhelming.¹⁷⁸ Two studies focused on the preparation of students for their first clinical placement.^{175,177} To investigate student RNs primary concerns regarding their first clinical placement, Levett-Jones and colleagues¹⁷⁵ reported the results from the distribution of a fitness for practice survey one-week prior to their clinical placement. Of the 262 participants, 231 had either full or part-time employment at an average of 15 hours per week. Of those who completed the qualitative comments (n=144), responses included: lack of knowledge (n=49), feeling nervous (n=34), fear of bullying (n=26) and fear of making a mistake (n=13).¹⁷⁵ An online survey of first year students (n=58) at one university in South Australia, reported similar results.¹⁷⁷ Students reported feeling moderately anxious (n=26), extremely anxious (n=8) and not anxious (n=5) regarding their first placement. The causes of anxiety were fear of making a mistake (n=44), making contact with patients for the first time (n=42) and being assessed (n=24).¹⁷⁷ One student reported:

I became stressed about the overall placement experience and started becoming extremely anxious before my shifts started, wanting to call in sick. It helped talking to people I trust e.g. my parents and my boyfriend, they encouraged me to go and ensured everything would be okay, and once I got to my shifts everything was fine.^{177, p 106}

Two studies specifically explored students' experiences of bullying on clinical placements.^{178,179} As part of a national survey of student RNs (n=398) Birks and colleagues¹⁷⁸ found that participants indicated they had experienced a diverse range of bullying experiences. They reported verbal abuse in front of patients, being rejected by the clinical team, racial, physical and sexual abuse, humiliation and name calling. The perpetrators of the bullying were all types of staff members and sometimes patients. The authors report:

Disappointingly, students from non-English speaking backgrounds were described by participants as being particularly vulnerable to bullying and harassment in the clinical workplace.^{178, p 47}

These findings are very concerning, as they serve to disrupt student learning and have been linked to career attrition, particularly if they occurred in a student's first clinical placement.¹⁷⁴ Given the propensity for this to occur to those from minority groups, such as those from CALD backgrounds, this has significant implications for retention of minority students. Other topics covered in the studies included:

- Quality of clinical placement^{180,181}: 'This study has found that upon entering their first PEP [Professional Experience Placement, students are welcomed into the clinical milieu, however at times assume a passive role in their learning that places the responsibility for the success for their PEP solely on the SWN [Supervising Ward Nurse]'.^{180, p 1008}
- Stigma and clinical placement: A study to compare the impact of a five-day non-traditional recovery camp placement on nursing student's stigma towards mental illness, with a traditional mental health placement.¹⁸² 'Recovery Camp appears to be an effective mode of reducing mental health stigmatisation for undergraduate nursing students'.^{182, p 174}
- Student centredness^{183,184}: '...there seems to be two necessary conditions for effective learning in clinical placements. First, a degree of constancy, a stable reference point in that

environment, usually provided by the continued presence of a preceptor and/or a clinical teacher. This could be facilitated by students moving less frequently between different healthcare environments. Second, a degree of student centeredness within the placement is important in creating an effective learning environment.^{184, p 2338}

- Storytelling from clinical placement experiences: ‘...this approach [reflection] allowed the participating students to consider the links between their knowledge base, their individual experiences and the realities of clinical practice..’^{185, p 44}
- Structured learning: ‘This is the first report that we are aware of that has quantified final-year BN students’ report of both anxiety and self-efficacy over repeated measures of time. Based on these findings, it would appear that all students continue to benefit from a structured learning program prior to their working with their preceptor nurse in a clinical placement and that the benefit of the intervention is sustained for the duration of the clinical placement’.^{186, p 176}

One study adopted a grounded theory approach to explore student satisfaction with their educational preparation.¹⁸⁷ The study included 17 semi-structured interviews of student RNs in their first (6) second (7) and third year (4) at two different universities. The study identified that most students had busy and pressured personal lives and that significant adjustments were required to incorporate the components of their educational preparation, including clinical placements. One of the participants stated:

So that pressure is tough for us students. Such a short period for placement ...and when you are only there for two weeks and they [nurses] want us to be at the same standard as those working there.^{187, p 177}

The results of studies not already reported above^{183,188-190} are provided in Table 12.

4.5.2.2 Supervision

Twelve studies related to supervision. Studies focused on the role of clinical facilitators,¹⁹¹ and on the role of RN preceptors.^{192,193} On clinical placements, student RNs are often supported by different members of the health care team. These include ward RNs, who are often termed mentors /supervisors /preceptors,¹⁹² and university or hospital employed facilitators. It is usually the facilitator who will assess the student against the relevant standards of practice, with input from the RN preceptor. The term facilitator was defined by the authors of one study as:

A RN clinician employed on a sessional basis by the university or seconded from a health care agency for the duration of the students clinical placement on a ratio of 1:8.^{194, p 334}

Studies adopted a mixture of designs, mostly quantitative surveys and qualitative interviews. Sample sizes were variable and ranged from 8¹⁹⁴ to 199.¹⁹⁵ The majority of studies were single-site and used self-reported outcome data. A clear gap in the literature was studies that examined the impact of supervision on student skill development and their performance on clinical placement.

A common focus amongst the included studies was an appetite to identify the most effective attributes of clinical facilitation. One author stated:

Little is known of what constitutes quality in clinical supervision, as there are no reports in the scholarly literature describing best practice in clinical facilitation.^{191, p 131}

One study reflected the perceptions of third year student RNs (n=43) on the qualities of a facilitator that enhance learning.¹⁹⁶ From a review of the literature the authors developed a tool in which 19 common qualities of effective facilitators were identified. Likert scales were used to measure the agreement of participants to the qualities. The most highly rated, in order of priority, were; the availability of the facilitator to spend time with the student and support them, the approachability of the facilitator, and the capacity of the facilitator to deliver appropriate feedback. Participants identified qualities that enhance a facilitator's performance such as, confidence, guiding learning, integrating knowledge and skills. Inhibiting qualities such as, lack of confidence, little time with students, lack of support and judgemental approaches were identified.¹⁹⁶ One participant highlighted the importance of the facilitator role to student RN learning:

I have noticed that there are evident inconsistencies between facilitators. Some really push you to do better and develop where as others are more laid back and although this is easier you don't develop as much.^{196, p 33}

To identify best practice in clinical facilitation, one study undertook focus groups and individual interviews with eleven facilitators in south east Queensland.¹⁹¹ The study reported three key themes, learning to facilitate, assessing and facilitating effectively. The level of information provided in relation to the practice of clinical facilitation itself was highlighted by participants:

I have been continuously told over the years that this is a very, very important role; however, there doesn't seem to be a great deal ... there isn't much formal education related to specific facilitating.^{191, p 134}

Most facilitators reported that a university course on facilitation would be helpful.¹⁹¹

Studies also identified the importance of preparing facilitators and RN preceptors for their role in terms of familiarising them with the requirements of the course to which the placement was related.^{191,197,198} In a study by Broadbent and colleagues¹⁹² of 34 RNs undertaking a preceptor role, only 67.6% participants received preceptor preparatory education in the hospital setting, whilst 29.4% received no training. One RN had received training in a university setting.¹⁹² Just less than half of the participants had undertaken a hospital-based certificate and had not progressed to a Bachelor or Master's level qualification. Therefore these facilitators had no experience themselves of the level of education for which they were facilitating and assessing student RNs.¹⁹² There was disagreement amongst participants in regard to the sufficiency of resources provided to assist them, 19 perceived that resources were inadequate and 15 strongly agreed that enough resources were provided. Twenty one participants perceived their roles were clearly explained and 23 perceived that the expectations regarding student learning were clearly explained. Qualitative responses frequently identified lack of time and role confusion:

Some confusion about responsibilities. Adequate time to devote to the role ended up having very little involvement.^{192, p 406}

Some participants perceived that universities were available to support them in their preceptor role (n=15), yet others did not and they received insufficient information regarding assessment requirements. When asked what could be done to improve the preceptor role, participants recommended that universities establish formal preceptorship training and that they communicate regularly with preceptors throughout student placements.¹⁹²

Two studies reported the evaluation of education packages for RN preceptors.^{193,195} The first evaluated an online clinical supervisor educational package, a training tool comprising four modules: defining roles, student feedback, trouble shooting and skill progression.¹⁹³ The educational package was uploaded to work stations in the clinical setting, it was designed to be easily accessible and user-friendly, and to provide support and resources to RN preceptors in the clinical environment. Survey results (n=28) indicated that the package increased perceived level of preparedness.¹⁹³ The second study described the day long *Art of Clinical Supervision Course*¹⁹⁵, which had been designed to provide RN preceptors with information and to generate a positive culture and attitude towards student RN clinical placements. Participants (n=199) perceived greater confidence and knowledge towards supporting students. Neither study included evaluation of the impact of the package on facilitator performance or student learning / satisfaction.

The development of critical thinking skills is an important component of student RN educational preparation. A study by Phillips and colleagues¹⁸⁹ investigated the use of questioning skills by clinical facilitators. Participants (n=133) completed an online survey containing three case scenarios, involving a patient and a third year student RN and were asked to identify the questions they would ask the student in each case. The majority of participants held a Bachelor degree, others held a diploma (n=12) or hospital certificate (n=28). Of the participants, 62 had completed an education related course or workshop. The questions posed by the participants were assessed in relation to their cognitive level. Approximately 73% of the questions were from a lower cognitive level and 27% from a higher cognitive level. The authors identified a significant relationship between participants who had completed an education related course and the cognitive level of the questions asked. There was no significant relationship between the academic level of study undertaken by the participants and the cognitive level of questions asked. These findings indicate that, undertaking an education related qualification can be helpful in developing higher level questioning skills, and potentially facilitating student RNs to enhance their critical thinking.

A final study focused on the role of the facilitator in a rural setting.¹⁹⁴ The facilitators participating in the study were employed by a university on a casual basis to solely facilitate student RNs during their placement. The facilitators undertook a preparatory workshop in which they discussed the purpose of the placement and the assessment requirements and facilitators were given a hard copy resource book. Qualitative phenomenology was used to explore the facilitators experience (n=8) and three themes arose, 'structuring clinical placements', 'structuring learning' and 'barriers to clinical placement'. In structuring placements, orientating the students to the rural environment was perceived as important, particularly to the rural culture. Prior to students arriving, the facilitators organised various

clinical experiences, one of which was a student-run ward experience, in which students take the full patient load:

We actually take a ward and work on the ward-it's our ward and they (staff) don't have to do anything for that ward because I am there with the students and I am running the ward. They (staff and students) love it!^{194, p 336}

Rural facilitators reported being extremely cognisant of student experience on placement, because they tend to use clinical placements as recruitment opportunities, in the hope that students will work there on graduation.¹⁹⁴

One study undertook an evaluation of the *Amalgamated Student Assessment in Practice Tool* undertaken in one university in Tasmania across two 13-week semesters.¹⁹⁹ Final-year student RNs (n=225) and their facilitators (n=23) provided feedback on the tool. Facilitators were provided with training in the tool and evaluative data were gathered through Likert scale surveys and qualitative feedback from meetings with facilitators. Feedback from student RNs was obtained through the formal university evaluation tool. The facilitators perceived the tool as straightforward to use and its structure helped them assess students' ability. In certain instances, the tool was helpful in structuring feedback on students who were to be removed from clinical placement for unsafe practices. Students perceived that the tool was valuable to their learning because it helped facilitators to pinpoint specific aspects of their practice that required development.¹⁹⁹

4.5.2.3 Placement setting

Twenty two included studies (one literature review of Australian studies, 21 Australian studies) related to clinical placement setting. Seven of these focused on primary and community healthcare, other topics were aged care (5), international placements (4), rural placements (3), mental health (2) and one each for aboriginal health, prison service and specialist placements.

The studies relating to primary and community health care explored student RNs knowledge and attitudes,²⁰⁰ student and mentor satisfaction,²⁰¹⁻²⁰⁴ placements in homelessness,²⁰⁵ and recovery camp.²⁰⁶ A qualitative study of the experiences of 12 practice nurses, in four different Australian states, explored perceptions surrounding the establishment of clinical placements and the relationship between the general practice and university.²⁰¹ Data collected through telephone interviews identified three themes, 'appropriate preparation', 'seeking greater consultation' and 'uncertainty and lack of support'. Participants reported students are often underprepared and have little understanding of primary care. Participants held different understandings of how clinical placements are organised:

Some of the students said that other people had their placements arranged for them whereas others had to actually go out and do it. I think that the fact that they did that is how I ended up with almost too many students. So I think that they've got to do it one way for everyone.^{201, p 188}

Participants reported receiving very little, if any, involvement from the university during the clinical placements:

Yes, it was a two-week clinical. Whether she (facilitator) phoned her (student) or emailed her or anything at home, I don't know, but I actually - apart from the letter before she started - I had absolutely no contact at all with the uni. I haven't even had anything to say, thanks for having us.^{201, p 189}

Two studies by McInnes and colleagues^{202,203} explored student perceptions of clinical placement and the experiences of primary care RNs who preceptored them throughout their placement. The first component of the study involved interviews with 15 student RNs studying combined degree and graduate entry Masters degree programs at one university. The students' experiences of primary care were positive and some students had underestimated the breadth of skills and knowledge required in primary care. Students appreciated the continuity of working with the same staff each day and they valued the therapeutic relationship they were able to build with their patients.

I have felt like I have learned so much. The nurse that I've been working with is incredibly friendly and incredibly eager to teach.^{202, p 440}

Working in a business model was uncomfortable for some students who perceived they were subservient to the general practitioner they were working with and the financial pressures associated with working in a small business. In their second study, McInnes and colleagues²⁰³ administered the *Clinical Learning Inventory and the Quality Clinical Placement Inventory* to the same cohort of students. High mean scores were noted in the domains of welcoming and belongingness, suggesting a culture of support for student learning. Only five participants (5/45) perceived that the placement was a waste of time, with the remainder reporting high levels of satisfaction (40/45). The RN preceptors of the students (n=22) completed a survey of their experiences. The main barriers to their role were the lack of payment (n=10) for clinical placements and lack of time (n=7). The majority of RNs (n=17) were motivated to provide support to student RNs. A study by Peters and colleagues²⁰⁴ reported similar student RN experiences (Table 12).

The attitude and knowledge of student RNs in a rural and metropolitan university towards primary care were studied by Mackey and colleagues.²⁰⁰ An online *Primary Healthcare Questionnaire* was disseminated to student RNs immediately following their clinical placement in primary care. Participants (n=286) demonstrated a range of knowledge (19.68-95.78) and attitude scores (33-93.88). Participants who were born in Australia had significantly higher knowledge scores than those born overseas. The mean scores of those enrolled in the metropolitan university were significantly higher than those enrolled in the rural university. In relation to attitude, the mean score of Australian born participants was significantly higher than those born overseas.

One study reports the findings from a survey of student RNs attending a placement at an Aboriginal Medical Service.^{207,208} Students reported a richness of cultural learning from their experience:

Everything I learnt in theory was seen every day in practice... it all made sense to me...things like racism and the huge cultural differences, and the depth of Aboriginal culture... . I realise how little I knew before....^{208, p 251}

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The experiences had in some instances motivated students to consider making contributions to Indigenous health care in their future careers:

...It has further motivated me to contribute to Indigenous health care....^{208, p 252}

Exposure to a mental health unit of study and a clinical placement is considered an essential and valuable component of the preparation of student RNs. The benefits of undertaking such placements extend beyond clinical skills development and have been shown to impact on students' attitudes towards mental illness, with students perceiving more positively following a placement and sometimes more likely to undertake a new graduate mental health role.²⁰⁹ The need to undertake clinical placements in an appropriate setting was identified in a study of mental health placements.²⁰⁹ A questionnaire was administered to students undertaking their final-year Bachelor of Nursing mental health unit (n=66). The unit was delivered flexibly, predominantly online with a two day face to face component. Only 25% of the students were exposed to a placement in a mental health facility and the remaining 75% were placed in general settings due to the shortage of placements available.²⁰⁹ A questionnaire, adapted from an existing attitude survey, was administered during the third week of the unit and one-week following the clinical placement. Whilst there were some changes in attitude, such as confidence and preparedness to care for patients experiencing mental illness these were generally minor and the authors were unable to fully attribute these to students exposure to the clinical placement (75% of which were in a general setting) or to their exposure to the theory component of the course. There was a small negative change in student attitude toward undertaking a new graduate position in mental health (13.6% pre-placement, 12.1% post-placement). The authors conclude:

In comparison, the findings from the current study suggest that clinical placements in non-mental health facilities have produced only minor improvements in students' attitudes and confidence toward mental health nursing. This finding underlines the need for mental health placements to be an essential component of all undergraduate nursing programs.^{209, p 2031}

The majority of clinical placements related to mental illness appear to occur in acute hospital settings, yet the use of recovery camps has been the topic of two included studies.^{182,210} Placements to recovery camps involve students spending five days and four nights at a recreation camp with consumers. The students engage with consumers, supporting and participating with them throughout the experience. An analysis of the written reflections of third year Bachelor student RNs attending a recovery camp (n=20) identified insights to their development of skills and knowledge through this experience.²¹⁰ The students reported feeling anxious and nervous prior to undertaking the camp, yet once involved they began to appreciate the process of recovery:

Although we speak constantly about recovery, I have never seen personally how it would be applied. This camp has provided me with that knowledge.^{210, p 96}

The uniqueness of the experience was identified by several participants:

In my future nursing practice, communication and establishing a therapeutic relationship with the consumers will be the most important priority.^{210, p 97}

The authors conclude that recovery camps are a positive learning environment for students and they may be a viable alternative to acute care placements, which are often in short supply.²¹⁰

Another clinical specialty reportedly in short supply of placements is primary care. One study explored the benefits of using a prison service in lieu of a general practice placement.²¹¹ The study administered a survey and telephone interview to student RNs (n=18) following their placement. Participants were generally positive regarding their learning experience and opportunities to develop skills, knowledge and attributes. A few students had challenging experiences with their RN preceptors, some working with a different preceptor each day and some finding the RNs level of engagement challenging:

I thoroughly enjoyed [the placement], but there are tough people in there to work with and that's not just the prisoners.^{211, p 59}

Several studies explored placements in aged / residential care settings.²¹²⁻²¹⁶ One study evaluated a student-led ward in aged care, designed and implemented to increase placement opportunities for students.²¹² The student led ward provided placements for all three years of student nurse education and increased clinical placements by 112.²¹² An ageing knowledge test and attitude survey pre-post placement (n=35) indicated an increase in knowledge in three out of five areas (sensory changes, delirium, drug actions) yet the post attitude survey identified a more ageist attitude than prior.²¹² Some students reported disappointment at being placed in an aged care setting and perceived that an acute care setting provided greater opportunities for skill development.²¹²

Slightly different findings were reported through two studies of student RNs undertaking residential care placements as part of the *Wicking Teaching Aged Care Facilities Program* in Tasmania. An increase in student knowledge of dementia^{214,215} and an improvement in student attitudes to aged care²¹⁵ were reported. A key strength of the placements in these studies was the relationship between the clinical facilitators and the students and its impact on learning.^{214,215} This finding is further supported by the results of an evaluation of a residential aged care placement.²¹⁶ In this study, the authors report that the university was approached by the manager of a residential aged care facility, who wished to increase the number of new graduate nurses seeking employment in their facility. In response, a two-week placement was established for final-year student RNs. The placement was carefully designed and included education for the RN preceptors and the students were well supported. Feedback from the students (n=8) was extremely positive, and highlighted the importance of the RN preceptor in shaping their experience:

Paired with a supportive RN who provided many opportunities to clinically assess and discuss clinical findings post assessment of clients with suspected urinary tract infections, DVT and the end of life care.^{216, p 185}

International placements were reported in a review of Australian literature.^{160,217} Eight studies were included in the review, focused on international clinical placements to the UK, Northern Ireland, Cambodia, Thailand, India, Nepal and Tanzania. The length of the placements ranged from eight days to five weeks. The sample sizes ranged from 3-39 participants, studies used qualitative data collection techniques and questionnaire. All of the international clinical placements appeared to be one-way, there were no exchange placements included. It was

unclear from the studies whether they counted as part of the students mandatory clinical placement hours or whether they were facilitated by an Australian RN or by a health professional in the host country and it was also unclear whether the placements involved learning outcomes specific to the RN practice standards.²⁸ The themes arising from the studies were 'development of cultural awareness and competence', 'providing a global perspective on health care', 'translation of theory to practice', and 'growing personally through reflection'.²¹⁷ There is some discord in terms of how effective the international placements were at developing beginner RN competence. Students perceived that significant learning occurred from their participation in these placements, yet a comparison of attitude change and cultural learning of students who had taken an overseas placement and those who had not showed that there was no significant difference in the change in the two groups.²¹⁸

A qualitative study examined the experiences of students' engagement in a two-week international clinical placement in Cambodia.²¹⁹ Eight students, from the first (2), second (4) and third (2) years of their Bachelor degree course, participated in semi-structured telephone interviews six-weeks after their placement. The placement was organised with a professional international placement company and was an additional experience to the existing curriculum (i.e. not mandated). The students were accompanied by two RN academics from the university and two interpreters. Themes reported from the interviews included 'preparation for placement', 'challenges', 'the experience was worthwhile', 'primary health care – it's a lot more than words on a page now'. In terms of preparation. A participant commented that:

...once I was there I thought how could you prepare for this? The things that I struggled with were things that you just had to work on while you were there...^{219, p 315}

Participants reported experiencing both physical and mental challenges in relation to the tropical heat, witnessing living conditions and the lack of privacy. At the end of the placement students perceived greater confidence and their awareness of primary care was far expanded, 'really piqued my interest for that kind of nursing career'.^{219, p 316}

Gower and colleagues²²⁰ undertook semi-structured interviews with student RNs (n=25) following international clinical placements in Cambodia, India, Philippines, Thailand and Tanzania. The placements in each country were organised through different means. Placements to Tanzania were organised through a Global Health Alliance, an amalgamation of schools of nursing in all five universities in Perth and the Western Australian Department of Health. Placements in Tanzania occurred in a public and private hospital and rural clinics. Placements in Cambodia, Philippines and Thailand were organised through relationships with one Western Australian university and local universities in each country. Students undertook rural placements in clinics. One student travelled to India to undertake a hand hygiene project. In each country, student RNs were supported by RN academics from their university. The themes arising from the interview data, conducted one year after the placements, included 'new understanding' 'challenges and opportunities'. Participants provided positive feedback on the placements particularly in relation to the development of clinical skills:

You are just more confident in yourself and more confident in your abilities as a nurse.^{220, p 2401}

A longitudinal study by the same authors, administered the *Inventory for Assessing the Process of Cultural Competence-Revised Scale* to 50 student RNs before, immediately after and then one year after attending a placement to Cambodia, India, Philippines, Thailand and Tanzania.²²¹ The scale has reportedly construct and content validity and reliability. The authors reported an increase in cultural competence immediately following the placement and this was sustained over time²²¹.

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Table 12 Clinical placements Australian literature

Topic	Title / study design / reference	Findings
Student experiences		
Experiences	Building workplace social capital: A longitudinal study of student nurses' clinical placement experiences. Six-year project to improve social capital in a tertiary referral hospital, through developing the leadership capacity of middle managers. Student RNs (n=1176) from three universities completed a Clinical Learning Culture Survey after their placement, then one and six years later. ¹⁸³	There was no significant change in student perceptions after one year indicating that the quality improvement process was not successful at that point. After six years social capital differences were evident across most of the subscales indicating that change had occurred. The authors conclude that building social capital can enhance the learning between students and staff members, thereby enhancing optimal care provision.
Experiences	Nursing students' perceptions of a collaborative clinical placement model: A qualitative descriptive study. Focus groups with final-year student RNs (n=14) following their final placement. ¹⁹⁰	Six themes were identified: convenience, camaraderie, familiarity, confidence, welcomed, and wanted. Overall the collaborative design meant students were working in a more familiar environment in a consistent placement structure and these appeared to reflect positively on their experience.
Stigmatisation	Nursing students' self-determination: the influence on stigmatising attitude within clinical placement settings. Work task motivation scale and social distance scales were administered to 198 second/third year student RNs pre and post an 80 hour mental health placement. ¹⁸⁸	Students' attitudes did vary between pre and post assessments. Those with high levels of self-determination prior to attending the placement demonstrated a shift towards a lower level of stigmatisation after the placement. Those with lower self-determination prior to the placement shifted towards a higher level of stigmatisation following the placement, suggesting that lower self-determination can lead to higher levels of stigmatisation towards patients following exposure to clinical placement.
Clinical placements	Student centredness in clinical learning: the influence of the clinical teacher. ¹⁸⁴ A longitudinal mixed methods study, single site. Clinical placement model called MASH student RNs undertake all clinical placements in the second and third years of their BN. Three student RN cohorts: (1) those not participating in MASH (clinical teacher only); (2) Non-MASH with clinical teacher and preceptor; and (3) MASH participation with clinical teacher and preceptor.	Games-Howell post-hoc test indicated that student RNs in the clinical preceptorship model responded more positively than students who had both a clinical teacher and a preceptor in a non-preceptorship partnership model. Student centredness is integral to fostering a positive learning environment; preceptorship does not necessarily foster a student-centred approach to learning; and continuity of a clinical teacher enhances students' clinical learning.

Topic	Title / study design / reference	Findings
Supervision		
English as a second language	Clinical expectations: what facilitators expect from ESL students on clinical placement. Analysis of the assessment documentation from 10 ESL students on clinical placement. ¹⁹⁸	Facilitators' comments on students' performance indicated that they expected students to communicate well and to have a good bedside manner, to be proactive and assertive. The responsibility for students' preparation for placements rests with the students. There is a need to improve the process of preparing facilitators regarding language assessment so they can better support ESL students.
Experiences of facilitators	The experiences of clinical facilitators working with nursing students in Australia: An interpretive description. Telephone interviews with 20 facilitators. ¹⁹⁷	Four themes were identified, preparing to work with students, facilitating successful clinical experiences, facing unique challenges, encountering rewards. The authors conclude that clinical facilitators require regular professional development to perform in their important role.
Mentoring in general practice	Practice nurses experiences of mentoring undergraduate nursing students in Australian general practice. Telephone interviews with 12 practice nurses, each who had supervised student RNs. ²²²	Themes identified in the data were, promoting practice nursing, patience and reassurance and reciprocity in learning. The authors reported that undertaking mentoring of students was a motivator for practice nurses to maintain their own currency in knowledge and skills.
Quality of supervision and clinical placements	Evaluating, understanding and improving the quality of clinical placements for undergraduate nurses: A practice development approach. Five-year quality clinical placement evaluation partnership between industry and university, Tasmania. ¹⁸¹	A three step approach was used to support ward RNs in their facilitation of students on placement. Facilitators attended a workshop, they then reviewed the results of a survey disseminated to student RNs (n=21) and ward RN facilitators (n=36) and considered how student RNs could be better supported in clinical placement. Results indicate that facilitation of student RNs is a challenge because of the increasing demands of patient care and limited opportunities for clinicians to explore the supervision aspect of their role.
Supporting students on clinical placements	Teaching and supporting nursing students on clinical placements: doing the right thing. Grounded theory study (n=15) RNs in Queensland, each with >5 years of experience. ¹⁴¹	The theory entitled 'do the right thing' encompassed participants' sense of responsibility to support nursing students. Participants perceived that supporting students was an extra function on top of their existing responsibilities. Few participants were aware that teaching and supporting students is a core part of the role of a RN and forms part of the RN standards of practice.
Whole of community model	Whole of community facilitator support model: The rural preceptors' experience. Online survey of RN preceptors of student RNs working in Tasmania. ²²³	Participants were satisfied (n=15) or very satisfied (n=8) with the information provided by the university. Twenty-two participants were very satisfied with the support provided by the whole of community facilitator. During the placement facilitators were very supportive and available to both student RNs and preceptors.

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Topic	Title / study design / reference	Findings
Placement setting		
Aged care setting	Nursing students' preferences for clinical placements in the residential aged care setting. Review of qualitative comments (2007-2014) input into the placement management system. ²¹³	607 comments related to aged care, 66.1% focused on requesting not to be placed in aged care, 16.8% requested aged care placements. The authors raise concern that aged care is unpopular amongst students and a partnership between industry and universities is required to address this.
Community	Examination of a therapeutic-recreation based clinical placement for undergraduate nursing students: A self-determined perspective. Third year student RNs (n=20), data collected through interviews, observation and reflection whilst students undertook a five day YMCA placement. ²⁰⁶	The Recovery Camp environment was perceived as an inclusive environment in which students could enhance their understanding of mental illness. The authors identified that the placement facilitated students to develop a deeper understanding of symptoms and experiences associated with mental illness.
International clinical placements for Australian student RNs	International clinical placements for Australian undergraduate nursing students: a systematic thematic synthesis of the literature. 8 studies, international placements to Thailand (3), UK (1), Ireland (1), Cambodia (1), India (1), Nepal (1), Tanzania (1). ²¹⁷	Seven studies qualitative, sample sizes three-to-nine for six of the studies, one study had 39 participants, one quantitative survey. Length of placements eight days – five weeks. From the self-report data, students perceived they developed cultural awareness, the placements helped them to translate theory into practice, placements provided a global perspective.
Primary care	Assessing levels of student nurse learning in community based health placement with vulnerable families: Knowledge development for future clinical practice. Student RNs (8) and homelessness staff (6) were surveyed and interviewed. ²⁰⁵	The placement gave students opportunity to broaden their understanding of the social determinants of health. The social focus of the placement was not accepted by all students, one of whom perceived the placement did not give them the opportunity to develop clinical skills. Learning about the community support services available was perceived as valuable.
Primary care	Nursing students' experiences of clinical placement in community settings: A qualitative study. Semi-structured interviews with 9 student RNs (graduate entry Masters) from one university. ²⁰⁴	Overall, the students enjoyed their primary care placement. They perceived that there was autonomy in practice, which was highly valued, the practice nurses were very skilled and showed genuine interest in the development of student RNs.
Rural placements	Supporting rural/remote primary health care placement experiences increases undergraduate nurse confidence. Pre/post confidence levels, focus groups, student RNs (n=31). ²⁰⁷	Increase in confidence post placement, particularly in relation to communication with Indigenous people (pre-35.5%, post-62.1%). Students perceived that their placement was valuable and provided learning and understanding that the university theory component did not.
Specialist placements	Undergraduate nursing students' placement in speciality clinical areas: Understanding the concerns of the student and	Themes reported from the data were knowledge and preparedness for placements, teamwork and being included and customising learning needs. The authors conclude

Topic	Title / study design / reference	Findings
	RN. Semi-structured interviews with 7 student RNs and 13 RNs. ²²⁴	that placements in specialty areas offer opportunities to observe excellence in teamwork, communication and assessment.

4.6 Simulation

4.6.1 International literature

Twenty-five reviews focused on the use of simulation, indicating that simulation has become a well investigated approach for the delivery of undergraduate nursing education. In addition, one review focused only on Australian studies and is discussed with the Australia literature below. The quality of the reviews was generally high, amongst them were systematic reviews comprising meta-analyses of studies. Very few studies offered any longitudinal results, with the maximum follow-up period identified as being a post-test of knowledge maintenance up to six months.²²⁵ Very few studies attempted to measure whether learning was transferred to the clinical setting. Those studies which did relied on self-report measures and asked participants whether they perceived the information they learned through simulation would be useful in their future practice. In their review of the quality of simulation-based evidence, Cant and Cooper report a:

... lack of consensus on how to measure 'learning'; as no single measure incorporated all the desired knowledge, attitude, and competency elements.^{226, p 48}

Most included reviews highlight the inadequacy of the available evidence and called for larger more rigorous studies to be conducted, including randomised controlled trials.^{11,12,225,227,228} The breadth and depth of reviews on simulation was broad. While some examples have been summarised in Table 13, the remainder are identified below:

- Use of puppets in simulation.²²⁹
- Mental health simulation.²³⁰
- Palliative and end-of-life care simulation.^{231,232}
- Patient safety, patient deterioration and resuscitation.²³³⁻²³⁵
- Critical thinking.¹³
- Anxiety and stress associated with simulation.²³⁶⁻²³⁸
- Debriefing²³⁹ and prebriefing.²⁴⁰
- Communication.²⁴¹
- Aged care suits.²⁴²
- Use of simulation in undergraduate nursing.²⁴³⁻²⁴⁵

The innovation of approaches to simulation were extraordinary and, as with the approaches to learning, they reflect a shift in focus from using traditional didactic methods of nursing education to strategies that engage the learner and authentically simulate the clinical environment to bridge the theory-practice gap. Study results provided some evidence that simulation was an effective means of delivering education and improved student knowledge, confidence and satisfaction.^{11,12,225,227} Simulation appears to have its greatest impact on psychomotor and cognitive skills rather than affective skills.¹² There appears to be development in simulation towards authentic end-of-life care simulation,^{231,232} mental health simulation,²³⁰ and the use of simulation aged care body suits and masks²⁴² to increase the authenticity and impact of using simulation to teach both non-technical and technical skills.

The quality and fidelity of simulation has been broadly studied. There are conflicting findings regarding the most effective level of fidelity of simulation (high, medium, low).²²⁷ However, several studies have provided evidence that high to medium fidelity simulations were the most effective in achieving knowledge and skill acquisition.^{12,225}

There appears to be variation in the application of simulation across the included studies, with use of high, medium and low fidelity simulation, sometimes combined with online learning, prebriefing^{231,240} and different levels or approaches to debriefing.²³⁹ Simulation frameworks do exist, but there did not appear to be any obvious stipulations that a specific approach was consistently favoured in any of the countries of interest. Other limitations reported in the reviews included the level of training of faculty to deliver simulation,²²⁷ cost of equipment, lack of adequately trained academics in particular skills, such as end-of-life care^{230,231} and lack of equipment and services to maintain mannequins.²³⁰

The success of simulation to achieve skills and knowledge acquisition has led academics to consider whether simulation can be used as an alternative to student clinical placements:

Internationally, several countries have acknowledged the value of simulation for nursing education by approving the use of SBE [simulation based education] as partial replacement of clinical practice hours. For example, in the United States, the National Council for State Boards of Nursing Study has determined that SBE could be substituted for clinical practice hours.^{228, p 23-24}

In their review, Cant and colleagues²²⁸ discuss two countries that have substituted a proportion of clinical placement hours for the use of simulation. In the UK, 300 of the 2,300 hours required can be replaced by simulation and in the US a recent national survey indicated that three-quarters of nursing schools were substituting simulation for clinical placement hours.²⁴⁶ One of the concerns raised by Cant and colleagues²²⁸ was the quality of simulation evidence available and whether this was adequate as the basis to make such a change.

A systematic review by Larue and colleagues²⁴⁷ sought to explore the evidence relating to the application of simulation to prepare students for clinical placement and simulation as a substitute for clinical placement. In their review, the authors refer to the US national study of simulation commissioned by the National Council for State Boards of Nursing Study, which determined that simulation based education could be substituted for clinical practice hours (Hayden and colleagues²⁴⁸, cited in the review by Larue and colleagues).²⁴⁷ In their review, Larue and colleagues highlight that:

Overall, these studies showed that clinical competency and critical thinking appeared to remain stable whether students received up to 10%, 25%, or 50% simulation in lieu of clinical placement hours.^{247, p 136}

The notion of whether simulation replaces or substitutes clinical placement hours in Australia has not yet been formally explored. Larue and colleagues²⁴⁷ make the argument that greater integration of simulation may be a plausible approach:

...rather than having a comparative perspective of these learning modes, it would be preferable to take advantage of the strengths of each mode according to area of

exposure and the desired effects. It would therefore be useful to examine various simulation-clinical combinations more closely depending on the area of exposure, and conduct realistic evaluative studies...within these contexts.^{247, p 138}

Table 13 Examples of reviews relating to simulation and student registered nurses

Title/Reference	Description of the paper	Findings
Use of simulation-based learning in undergraduate nurse education: an umbrella systematic review. ¹¹	Appraised the impact of simulation-based education for undergraduate / nursing students, using existing reviews of literature. Twenty-five reviews included integrative reviews (12), systematic reviews (13), meta-analysis (4). Reviews focused on simulation effectiveness (n = 10); patient deterioration/patient safety (n = 6); delivery of simulation (n = 5); psychomotor impact (n = 2); self-efficacy (n = 1) and non-technical skills (n = 1).	Simulation experiences improved knowledge and enhanced self-efficacy, skills acquisition, confidence and competence, although self-reported outcomes should be regarded with some caution. There were gaps in evidence regarding the effects of simulation, and large-scale research is needed.
The value of simulation-based learning in pre-licensure nurse education: a state-of-the-art review and meta-analysis. ²²⁶	The study aimed to review current evidence for the effectiveness of medium to high fidelity simulation as an educational strategy in pre-licensure (pre-registration) nursing education.	Simulation programs demonstrated innovation and excellence. In future research, higher-level designs that use validated assessment tools would be beneficial in increasing the credibility and available evidence to support simulation-based learning in nursing student education.
Do simulation studies measure up? A simulation study quality review. ²²⁸	Examined the methodological quality of quantitative research publications that evaluate the use of simulation-based education in nursing. All primary quantitative simulation research studies published in Clinical Simulation in Nursing in 2017 which reported a simulation intervention and study outcomes were selected. 26 studies were included, student RNs (20), Australia (1), Canada (4), US (18), Singapore (1), South Korea (1), China (1).	Varied levels of research design ranging from experimental controlled trials to single or two-group pre-post evaluation studies or to post-test-only single group designs. Participant samples ranged from 23 to 207. Twenty of 26 studies reported positive benefits of simulation, six studies identified no benefit in terms of knowledge or skills improvement. The included studies were of moderate to high methodological quality. Future research aiming to determine the true impact of simulation should be considered.
Effects of simulation on nursing student stress: an integrative review. ²⁴³	The purpose of this review was to critically integrate the literature related to the stress that nursing students experience regarding high-fidelity simulation. 17 studies were included, 11 (US), UK (4), Brazil (2), Korea (1).	Whilst simulation can be regarded as a safe environment for learning, many students perceive it as an extremely stressful experience. In some instances, simulation stress can be greater than stress associated with clinical care.
Evaluation of simulation in undergraduate nurse education: an integrative review. ²²⁷	The aim of this review was to synthesise the research findings regarding evaluation of simulation in undergraduate nurse education. 101 studies were included, country of origin was not indicated.	Students indicated satisfaction with simulation, simulation lead to skills / knowledge acquisition, confidence / self-efficacy and interdisciplinary experiences. Conflicting information was noted regarding the fidelity level of simulators needed to create meaningful learning experiences.
The effect of mannequin fidelity on the achievement of learning	Meta-analysis focused exclusively on comparative studies examining the influence of fidelity on knowledge,	Training on higher-fidelity mannequins has the potential to increase learning outcomes. However, when students were re-tested for knowledge

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Title/Reference	Description of the paper	Findings
outcomes for nursing, midwifery and allied healthcare practitioners: systematic review and meta-analysis. ²²⁵	psychomotor and non-technical outcomes. 18 studies included, Australia (3), US (12), UK (2), Jordan (1). Majority of studies were on student RNs (12).	weeks or months after an intervention, there was no evidence that the advantage gained by higher-fidelity trained groups had been maintained. Four studies demonstrated a statistically significantly greater gain in knowledge in the group using higher-fidelity mannequins compared to that using lower-fidelity equipment. None of the studies were able to demonstrate a statistically significant difference between knowledge gained by groups trained on different mannequins. Four studies reported on knowledge scores at 2–6 months follow-up. One study reported a significant difference favouring the high-fidelity group at 3-months.
Effectiveness of patient simulation in nursing education: meta-analysis. ¹²	To identify the best available evidence about the effects of patient simulation in nursing education through a meta-analysis. Twenty primary studies were included, studies included used high fidelity (12) low fidelity (3) and standardised patients (3). Results analysed using Kirkpatrick's four levels of evaluation.	Simulation can improve learning outcomes, particularly psychomotor and cognitive skills, compared to traditional lectures. Maximum effect is achieved for senior student RNs who already have some clinical exposure. High fidelity and medium fidelity simulation yielded largest effect.

4.6.2 Australian literature

Thirty-six Australian studies (one literature review of Australian studies, 35 studies) explored the application of simulation to undergraduate nursing education (Table 13). The review paper is a scoping review that examines the use and contribution of simulation in undergraduate nursing education.²³⁰ Of the 44 included studies within this scoping review, 38 of these were published after 2012. Of these 38 papers, 13 studies were also identified with this review of Topic 3. This suggests something about the complexity of identifying suitable studies on the topic of skill development for student RNs. Kunst and colleagues²³⁰ identified the use of a diverse range of simulation modalities including: high-tech mannequin simulation, masked simulation, role play, scenario-based simulation, standardised patient, static mannequin simulation, skill stations, video and auditory simulation. From a synthesis of existing guidelines, the authors developed the following framework for best practice and applied this as an evaluative tool to the studies included in the review:

- Progressive/systemic integration of simulation activity within the course/program. Where does simulation fit within a course? Is simulation a single activity or does it fit across multiple phases?
- Design for progressive development of skill/capacity. Simulation is based on a learning theory / pedagogy / framework; clear learning objectives; available to all staff before implementation; available to students before simulation session; scenario is authentic (likely to be commonly encountered and/or have significant impact).
- Operationalisation preparation of staff. Adequately trained to facilitate simulation, understand the purpose, aims, and learning outcomes; learned how to facilitate / coach in simulation; prepared to lead debriefing; preparation of students including structured prebriefing and engagement with prelearning, orientation to environment, equipment, mannequin, and monitoring devices.
- Evaluation of student performance, formative or summative? Formal or informal? Comprehensive / holistic, psychomotor skills, communication, teamwork, and professional behaviour, clinical reasoning / problem solving, reflective thinking.

Using this framework the authors identified that most studies used high tech-mannequins (n=11) or standardised patients (n=9). Very few included studies reported clear learning objectives and whether these objectives were made available to staff and students prior to the activity. Only four studies reported the engagement of staff members in debriefing and facilitation and less than half of the studies (n=20) reported using an underpinning framework or learning theory.²³⁰ None of the studies reported using simulation as a summative assessment.

The authors²³⁰ concluded that simulation has been under evaluated, particularly in relation to pre-briefing, debriefing and the lack of rigorous evaluation that explores student performance against existing professional practice standards. They wrote:

In mapping the extent, range, and nature of evidence around the use and evaluation of simulation in undergraduate nurse education in Australia, this review confirms a common finding in simulation education, that is, a lack of rigorous experimental evidence to provide definitive evidence of the impact of simulation to enable

students to meet intended learning outcomes and enhance learning in clinical practice Further information is needed about students' actual experiences of applying skills learned in simulation in the clinical environment).^{230, p 26}

The Australian studies, below, explored a complex range of topics, indicating the breadth and depth of the field of simulation research:

- Anxiety and simulation performance.²⁴⁹
- Use of simulation to improve discharge communication practices.^{250,251}
- Student experiences of end-of-life care simulation.^{252,253}
- Measuring the impact of simulation on developing students' empathy.²⁵⁴⁻²⁵⁶
- Simulation videos to improve students' knowledge of family assessment.⁸³
- Mask-Ed simulation to develop skills of intimate patient care.²⁵⁷
- Simulation of a mass casualty incident to facilitate students' development of mass casualty management skills.²⁵⁸
- Medication administration simulation to improve time management and overcoming interruptions.²⁵⁹⁻²⁶¹
- Using simulation to improve students capability in mental health care.²⁶²
- Ward for a day paediatric simulation in preparation for clinical placement.^{263,264}
- Recognising and managing patient deterioration.^{265,266}
- Effectiveness of simulation on clinical decision making.²⁶⁷
- Simulated hospital to facilitate student readiness for clinical placement.²⁶⁸
- Development of intravenous infusion administration skills via a remote access laboratory.²⁶⁹
- Simulation design.^{251,270-277}
- Use of puppets in simulation²⁶⁴ and silicone masks.²⁷⁶

It could be argued that the quantity of literature on simulation indicates a growing maturity of simulation research, yet the sample sizes, design and outcome measures seen in the included studies, compromise the capacity to draw generalisations. The spread of available research may also be an indication of an absence of national coordination and standardisation in the use and application of simulation in undergraduate nursing education in Australia.

The Delphi study by Arthur and colleagues²⁷⁰ sought the opinion of 17 international simulation experts on the development of a set of simulation quality standards. Four quality indicators were developed relating to fidelity, student preparation and orientation, staff preparation and training and debriefing. This study highlights the importance of adequate staffing and staff training in scenario design, debriefing and simulation technology. Furthermore, the panel members recommended that simulation be integrated throughout the undergraduate nursing curriculum. Through a process of scaffolding learning, the complexity and level of support can be altered according to students' year of progression to drive skill development.²⁷⁰

Gamble²⁶³ used a simulated paediatric ward to prepare final-year Bachelor of Nursing students for their elective paediatric placement. A number of high and medium fidelity mannequins including infants, children and adolescents were used in combination with standardised patients who played the role of patients' family members and adolescents. The students self-selected into groups of 8-9 students and worked in shifts of 3.5 hours. They received a pre-briefing prior to the scenario and a debrief immediately afterward. The scenarios used in the simulation were developed by academics and nurses with paediatric expertise. Students completed an evaluation form and the *Satisfaction with Simulation Experience Scale*²⁷⁸ immediately after the simulation. Their feedback was sought after they completed their clinical placement and at three months after the simulation. Feedback was positive and students perceived that the simulation helped them prepare for their placements. After the placement and at three months the students perceived that communication and teamwork skills were the most significant learning points from the simulation.²⁶³

In some respects, the study by Gamble²⁶³ is characteristic of many included studies on simulation. It was located in one setting, it had a small sample size, focused on one cohort of nursing students, used a locally-generated simulation strategy and the simulation was evaluated using self-report surveys, notwithstanding that the *Satisfaction with Simulation Experience Scale* is a validated tool.²⁷⁸

Different approaches to and uses of simulation were also apparent in the literature. Simulation incorporated both physical-based simulation and online simulation aspects. There were several innovative approaches to simulation, with case-based learning (n=3) and high fidelity simulation (n=2), as well as one study of online case-study approaches.

Simulation allows students to gain skills and overcome barriers to professional practice. Two studies looking at the implementation of high-fidelity Mask-Ed simulation in nursing care provided baseline evaluation of this approach to learning.^{279,280} A high-fidelity Mask-Ed™ (Knowledgeable, Realistic, Spontaneous simulation) intervention was developed and piloted with first year nursing students to increase confidence and skills around intimate care during patient showering. While students initially felt intimidated, awkward, nervous, and anxious about showering patients, after the Mask-Ed simulation, 93% reported feeling more confident and having insight into the patient experience. The realism of the experience was a major contributing factor to the students' learning experience. The initial study was a pilot study of the technology²⁷⁹ that provided the reflections of teachers of using the technology and its effect on students while the second study provided more formative evaluation results, in which student RNs provided their feedback, for example:

It was very real life. I was able to see/experience what it would feel like in the field.

We were shown with an actual person, which made me feel very comfortable, as they told us what they liked and used different scenarios of what could happen.^{280, p}

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Providing as close to real simulation as possible appears to enhance learning. Power and colleagues²⁸¹ reported a layered, technology-enhanced, approach to improve the simulation learning experience. The authors drew on the principles of narrative pedagogy in which *Tanners Model of Clinical Judgement* underpinned the entire curriculum. Across ten teaching weeks, five

separate case studies were introduced to students through short vignettes lasting approximately five minutes each. The authors²⁸¹ identified that using a narrative pedagogy and an increased realism approach was a highly effective method of increasing student engagement with mannequins. They also reported other advantages such as allowing students to reflect on their own values and pre-conceived notions of people from diverse backgrounds were realised. The key to successful simulation, however, was to give the plastic a personality and ensure it was close to real life.

Table 14 Examples of Australian studies relating to simulation and student registered nurse skill development

Title/Year/Reference	Description of the paper	Findings
Quality indicators for the design and implementation of simulation experiences: a Delphi study. ²⁷⁰	Delphi study that synthesises expert opinion on the pedagogical principles and teaching strategies that are indicative of quality in simulation based learning activities. International expert panel, first round (17) second round (11) third round (12).	Four quality indicators were developed: fidelity, student preparation and orientation, staff preparation and training, debriefing.
Simulation in undergraduate paediatric nursing curriculum: evaluation of a complex 'ward for a day' education program. ²⁶³	To evaluate the short and medium term impact of an extended multi-scenario simulation for third year undergraduate students enrolled in a paediatric nursing subject (n=28). Students feedback on the simulation was sought immediately afterwards using the Satisfaction with Simulation Experience Scale, then after their clinical placement and then three months following the simulation.	Feedback was positive. Following the clinical placement and three months following the simulation, students reported that communication and teamwork were the most valuable skills learned from the simulation experience.
A scoping review of the use and contribution of simulation in Australian undergraduate nurse education. ²³⁰	Identified the elements of simulation that have been well developed, along with gaps in understanding in simulation education in Australia, and directions for future research.	Quality of simulation in Australian nursing programs is mixed. A detailed appreciation of the contribution of simulation to the development of nursing clinical practice is lacking. Understanding the scope of simulation in nursing curricula design, linked to professional standards for practice with guidance regarding student preparedness for practice, is overdue.
A national training program for simulation educators and technicians: evaluation strategy and outcomes. ²⁷⁵	In 2011, a group of Australian universities developed a national simulation training program - Australian Simulation Educator and Technician Training Program. This paper reports the evaluation of this large-scale initiative. Mixed methods evaluation, surveys (254), observation (18), interviews (9). For each module, between 45 and 254 participants completed evaluations.	The training program had several strengths and appeared to facilitate an increase in confidence. The transferability of the training was not measured in terms of the capacity for learners to deliver simulation themselves. The authors concluded that a national program for simulation educators is valuable for supporting others in using simulation as an educational method.
Providing simulation experiences for large cohorts of first year nursing students: evaluating quality and impact. ²⁷⁷	Evaluation of first year nursing student participation in a simulation activity (375). Student self selected to a group of 8-10 students and cared for a deteriorating surgical simulated patient. Following a simulation activity, data were collected from 12 students using focus groups.	Five themes were identified: (1) knowing what to expect; (2) assuming roles for the simulation; (3) authenticity and thinking on your feet; (4) feeling the RN role; and (5) preparation for clinical practice.

5 Student enrolled nurses

Searching the literature identified no literature reviews focused on student ENs and only three Australian papers that met the inclusion criteria, one of which²⁸² has been included because it underpins the current EN Australian standards of practice. The paucity of literature meant it was challenging to understand the factors that contribute to optimal skill development and the current trends and interventions utilised to develop clinical skills in student EN programs. To provide background to the educational preparation of ENs, the registration authorities in each country of interest were explored and an overview has been provided below.

5.1 Standards of practice

In Australia, education is provided by the state or territory based vocational education and training sector such as TAFE institutes or approved private Registered Training Organisations. The minimum level of study is the Diploma of Nursing which can range from between 12 to 24 months.²⁸³ It requires 400 hours of clinical placement. The Nursing and Midwifery Board of Australia (NMBA) provides a set of practice standards for ENs.²⁸⁴ Included, is the requirement for ENs to practice under the supervision of a RN. The EN programs are accredited by the Australian Nursing & Midwifery Accreditation Council and subsequently approved by the NMBA, the national Health Training Package actually dictates the course content for EN programs and the content is not developed by the profession of nursing. Rather, a not-for-profit, independent Skills Service Organisation (SkillIQ²⁸⁵) develop the training product on behalf of the Industry Reference Committee.

Perhaps one of the most enlightening studies identified related to the factors affecting skill development of ENs and was a study that underpinned the development of the recent NMBA standards for practice of ENs in Australia.²⁸² Endacott and colleagues²⁸² aimed to identify the perspectives of ENs and RNs on the current scope of EN practice. An online survey was developed with 22 statements relating to the EN role to which participants either agreed or disagreed. Participants were also required to indicate the components of the EN role against a *Contemporary Activities Scale* of 89 activities that ENs may be required to undertake. Akin to a skills list, the *Contemporary Activities Scale* was developed from a review of the literature and a consensus process with experts in the field (Table 15). In presenting Table 15 the skills have been divided into technical and non-technical skills for ease of interpretation.

The breadth and complexity of skills and procedures included in the scale is reflective of the diversity in roles that ENs undertake, with some ENs working in very specialised areas. In the study, each of these skills and procedures was undertaken to some degree by the 1104 EN participants. Eighty-seven percent of EN participants reported that they did not undertake roles for which they were unprepared, yet 36.4% reported having been requested to undertake activities for which they were not prepared. Sixty-seven percent of ENs undertook activities other than direct patient care, including education, facilitation of students and care coordination. Half of ENs perceived that they practised more like a RN than an EN and 63% disagreed that they required direct supervision.

Both EN and RNs reported that the focus of the EN role is provision of fundamental nursing care (activities of daily living, documentation, communication and medical administration). There

were no significant differences in participant responses between the States and Territories in which they worked.

Table 15 Contemporary activities scale²⁸²

Technical skills	Non-technical skills	Procedures
Checking S8 and other drugs Pulse oximetry Fluid balance charting History taking Drug chart documentation Blood glucose interpretation ECG monitoring IV site assessment OHS monitoring and reporting GCS assessment Respiratory assessment Health promotion activities Nutritional assessment IV therapy management Geriatric assessment Post-operative care Pre-operative care Integument assessment Neurological assessment Patient controlled analgesia monitoring Mental health status Management of chest pain PEG tube management Health screening Peak flow monitoring Abdominal assessment Cardiac assessment MET call response CPAP-BiPAP and management ECG rhythm interpretation Advanced life support Underwater seal drainage management CVAD access & management Antenatal care JVP measurement Chest X-ray interpretation Postnatal assessment Neonatal assessment	Communication with health care team Care planning Assisting patient ambulation Activities of daily living Handover delivery Patient education Counselling Conflict management Breastfeeding support & advice Teaching parental skills Postnatal care of the mother	Aseptic dressing technique Blood glucose monitoring Oxygen administration Subcutaneous injection TED stocking application Insulin administration Enema & suppository administration Inhalant therapy Removal of sutures, drain tubes Breathing exercises Intramuscular injection Range of movement exercises Bladder scanning Basic life support Enteral feeding Ostomy care Parental medication administration Venepuncture Syringe driver management Plaster cast care Blood transfusion administration IV medication administration Urinary catheterisation –female Immunisation Oropharyngeal suctioning IV additive administration CPAP-BiPAP ventilation application Cervical collar application Bladder washout PICC line management Tracheostomy care Mastectomy care Urinary catheterisation -male Nasogastric tube insertion Cytotoxic spill management Plaster cast application Arterial blood gas collection Neonatal medication administration Intra-osseous infusion

In NZ, ENs complete an 18-month diploma at an accredited educational institution. The diploma consists of 900 hours of theory and 900 hours of clinical practice³⁹ and is focused on addressing competencies stipulated by the Nursing Council of NZ²⁸⁶. Applicants undertake a state examination that assesses physiological knowledge, psychosocial / communication, clinical skills / knowledge, ethical / legal safety. Cultural safety is integrated across the examination in a range of settings.

In Canada, the role of EN is titled Registered Practical Nurse (Ontario) or Licensed Practical Nurse (all other provinces and territories). Educational preparation includes a two-year nursing program from an approved college-level program similar to vocational education in Australia, leading to the Canadian Practical Nurse Registration Examination.²⁸⁷

In the US, the Licensed Practical Nurse (LPN) or Licensed Vocational Nurse (LVN) (used in California and Texas) typically complete a 12-month vocational course, and then sit to take the NCLEX-PN examination. This examination is operated by the National Council of State Boards of Nursing and provides the national standard for LPN/LVNs. In addition to the NCLEX-PN, each State sets its own educational requirements, such as standards for supervision and continuing education.²⁸⁸

In the UK, the role of nursing associate is equivalent to an EN. The nursing associate is a new role intended to address a skills gap between health and care assistants and RNs.²⁸⁹ There are currently transitional arrangements for a new system starting in February 2019. The pilot educational programmes ran for two years. The Nursing and Midwifery Council²⁹⁰ has developed a set of standards of proficiency for nursing associates which outlines the range of procedures to be undertaken by the nursing associate as well as requisite communication and relationship management skills. Only in the UK are there detailed listings of skills and procedures that ENs (or their equivalents) are required to perform.

5.2 Australian literature

The two remaining Australia studies focused on supporting the skill development of students enrolled in an Aboriginal Diploma of Nursing²⁹¹ and night duty placements for student ENs (Table 16).

Slatyer and colleagues²⁹¹ focused on the barriers and enablers to the retention of students enrolled in an Aboriginal Diploma of Nursing in Western Australia. This study highlights several important factors in relation to skill development. From a combination of a survey and focus groups with ten student ENs, the most influential motivation for enrolling was found to be family encouragement. Participants were concerned about the academic difficulty of the course, the financial commitment and travel and absence from family. The knowledge and skills components of the course were supplemented with strategies to support students and facilitate their development of coping strategies. Prior to enrolling in the course, students were interviewed to assess their communication skills, numeracy and literacy. Throughout the course these fundamental skills were further facilitated to support the students to succeed academically. Slatyer and colleagues²⁹¹ assert:

Students perceived the RTO [registered training organisation] as a unique opportunity for Aboriginal students as it was a culturally safe environment with

course content and delivery tailored to their educational needs. The RTO was referred to as a 'bridge' for students to become educationally prepared as ENs. Despite social and educational disadvantages and cultural variations within and between Aboriginal people and others, the staff contributed to a positive learning experience.^{291, p 18}

In their study of night duty placements, Zielinski and Beardmore²⁹² observed the participation of final-year EN students in a two-week night shift placement as part of their preparation for practice in an acute care facility. Data collected were through focus groups with student ENs (n=38) and permanent ward night staff (n=6) and individual interviews with personnel (n=4) representing the education and health facility perspectives. The focus groups were undertaken pre and post placement. The impetus to establish the night shift placements came, in part from the high demand for clinical placements in acute settings on weekdays. Prior to the placements the participants were concerned about their travel to and from placement, as well as the night shift itself. The post-placement interviews highlighted the value in learning from undertaking the night shifts. Participants described having more time to learn, and clarify information with the ward staff. Participants were exposed to a diverse range of experiences, unlike those they had seen before during the day shift. One participant commented:

I have been fortunate to experience a whole range of complex skills, such as, tracheostomy suctioning, intercostal catheter, wound care, ECG, taking blood, blood transfusion and so much more.^{292, p 18}

The authors conclude that night duty provides the opportunity for student ENs to consolidate their skills and relate theory to practice and to understand:

...the reality of nursing as a twenty four hour continuity of care.^{292, p 21}

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Table 16 Included papers with a focus on enrolled nurses

Title/reference	Description of the paper	Findings
Roles and functions of ENs in Australia: perspectives of enrolled nurses and RNs. ²⁸²	Exploratory descriptive study using a cross-sectional online survey of 892 ENs and 1198 RNs across Australia examining their levels of agreement on their scope of practice and the clinical and nonclinical activities that ENs were required to perform in their workplace.	In practice, many ENs are working at a similar level to RNs. There is role confusion due to the expansion of the EN role. Findings indicate a skills overlap, confirming findings of earlier studies. Clarifying the roles and scope of practice between the RN and the EN is important, and explicit differences in responsibility and accountability between their roles must be clearly articulated to harmonise perceptions about role and capability.
Barriers and enablers to retention of Aboriginal Diploma of Nursing students in Western Australia: an exploratory descriptive study. ²⁹¹	A survey and focus groups with ten indigenous student ENs was used to evaluate a training program developed for the learning needs of Indigenous people. The barriers and enablers to retention of Indigenous students in an Aboriginal Diploma of Nursing in Western Australia were explored.	The authors found that a team approach promoted consistency between educator presentations and student learning styles. Active modes of teaching were found to suit Aboriginal student learning styles with an emphasis on learning by doing, including talking and showing. Additionally, group learning opportunities with peer interaction were an effective means for students to learn from one another and build confidence. In lieu of tutorial support, students sought academic assistance from each other to help complete course work. The authors also found that most students welcomed their practicum placements and that those who exhibited resilience found that the practicum work affirmed that they had achieved specific skills.
Rethinking student night duty placements - a replication study. ²⁹²	Observed the participation of EN students in a two week night shift placement as their preparation for practice in an acute care facility, data collected through focus groups with students and ward nurses before and after the placement.	Student ENs reported positive experiences from night duty. Some of them needed to travel over an hour to get to their placement. The night shift experience increased their awareness of continuity of care and the continuous nature of nursing work.

6 Nurse practitioner candidates

Two literature reviews and four Australian studies were identified in relation to the clinical skills development of NP candidates, summarised in Table 17. The educational preparation of NPs in each country of interest differs and warranted some level of explanation in order to understand the skills required of NPs. Similar to the roles of ENs and RNs, there appears to be limited guidance on the specific skills required of NPs. This may be more apparent in the NP space, as these expert clinicians have a clear specialty area in which they practice.

6.1 Standards of practice

In Australia, prior to endorsement as a NP, candidates are required to demonstrate 5,000 hours of clinical experience at an advanced practice level. They must also have completed an approved Masters Level course, and be endorsed by the Nursing and Midwifery Board of Australia.²⁹³ The NP standards of practice²⁹³ cover four broad domains – clinical, education, research, and leadership. The NP standards were developed using a mixed-methods approach that included surveys, focus groups and interviews with stakeholders and observation of NPs.²⁹⁴

In Canada, each province has its own regulatory body, assessment process and license for NPs and these are different from one another.²⁹⁵ Some require an amount of experience prior to obtaining the license and some provinces use the US-based certification exam from either the American Nurses Credentialing Corporation or the American Association of NPs credentialing system. In Canada, NP candidates are required to have had two years nursing experience, and then completed an appropriate one to three-year Masters NP program.

Unlike Australia, in the US, NPs are included in a broader group of nurses called advanced practice RNs (APRN). This group also includes certified nurse midwives, clinical nurse specialists, and certified RN anaesthetists. All APRNs must complete an accredited graduate nursing program.²⁹⁶ Educational preparation of the NP is provided at Masters and Doctoral or post-graduate program levels, and there is an emerging trend of doctorally prepared NPs.²⁹⁷ After completion of the course, applicants then need to achieve national certification from one of five accredited certifying bodies.

Criteria for NP programs are developed by the National Organization of NP Faculties (NONPF).²⁹⁸ One of these criteria is a minimum of 500 supervised direct patient care clinical hours, in which the NP competencies are to be demonstrated. Accreditation for NPs is provided by the Accreditation Commission for Education in Nursing (ACEN) or the Commission on Collegiate Nursing Education (CCNE). The ACEN and CCNE establish NP competencies in concert with the National Council of State Boards of Nursing. The competencies follow the LACE (Licensure, Accreditation, Certification, Education) Consensus Model for APRN regulation.²⁹⁹ Competencies have also been established for NPs working in particular settings. The Adult-Gerontology NP Competencies Work Group³⁰⁰ has also set competencies for NPs working in Adult Gerontology Acute Care and Adult-Gerontology Primary Care settings using the domains for the core competencies. The Population-Focused Competencies Task Force set competencies for NPs working in the following settings:

- Family/Across the Lifespan.
- Neonatal.

- Pediatric Acute Care.
- Pediatric Primary Care.
- Psychiatric-Mental Health.
- Women's Health/Gender-Related.

In the UK, there is no standardised educational pathway for NPs. The absence of regulation of NPs has led to professional bodies stepping in to articulate expectations. The Royal College of Nursing and the Royal College of Emergency Medicine have separate credentialing processes. The Royal College of Emergency Medicine³⁰² provides a very extensive list of almost 200 pages of competencies and skills that an advanced clinical practitioner requires. The College is introducing a new process for credentialing that relies on the gathering of a substantial body of evidence related to these competencies.³⁰³ The Royal College of Nursing³⁰⁴ also specifies a range of detailed criteria, including education to Masters level, evidence of performance in four domains: advanced clinical practice, leadership, facilitation of education and learning and evidence research development. The NP must demonstrate their position description reflects these four domains, they must hold a non-medical prescribing qualification and show evidence of several performance indicators including the authority to act autonomously. Whilst these competency lists appear the most robust internationally, there is no evidence about their impact on learning, clinical skills acquisition or patient care.

In Ireland, the term advanced practice nursing is used, rather than nurse practitioner. The standards of practice are guided by the *Advanced Practice (Nursing) Standards and Requirements*.³⁰⁵ Advanced practice nurses are educated to Master's level, and practice-based learning is a mandatory component. One of the criteria for registration as an advanced practice nurse is completion of 500 clinical supervised hours in the specialist area of advanced practice.³⁰⁵

6.2 International literature

Perhaps one of the most interesting developments in the education of NPs in recent years is the US proposition of the substitution of clinical placement hours with clinical simulation. Two systematic reviews explored the evidence relating to simulation and NP education.^{306,307} Of note, despite having similar search criteria, the reviews identified and included different studies, with the exception of one study,³⁰⁸ which was included in both reviews. This is perhaps an indication of the complexity of exploring the literature relating to simulation and nursing education.

The systematic review by Rutherford-Hemming and colleagues³⁰⁶ sought to examine whether there was sufficient evidence to replace the 500 hours of direct patient clinical hours required of NP candidates in the US. The issue was raised because of the difficulty in obtaining quality clinical placements for NP students. At that time NONPF made the decision that there was insufficient evidence on which to substitute clinical placements with simulation. In their review,³⁰⁶ the authors identified 15 papers as relevant to simulation and NP education, all from the US. The sample sizes of the included studies ranged from 13-145 with an average of 34 participants. A range of simulation techniques were described, including; high and medium fidelity simulation and role playing. The most common form of assessment of learning outcomes was a pre-post test. However, there was variation in the use of either a validated or

non-validated tool. The results from the studies included in the review were positive in terms of the capacity of simulation to increase student knowledge, confidence and satisfaction. The authors³⁰⁶ concluded that given the quality of the studies available and the absence of randomised controlled trials, there was insufficient evidence on which to endorse the substitution of clinical placements with simulation.

The second systematic review investigated the effectiveness of simulation on learning outcomes and satisfaction in NP programs.³⁰⁷ This review identified the mixed quality of the studies and reported that very few studies assessed behaviour change. Highlighting one of the key limitations of educational research, Warren and colleagues commented that:

... evaluations at the behaviour and patient outcome levels are not commonly measured in nursing education as these levels must be evaluated in real clinical settings.^{307, p 107}

They concluded that future studies of the application of simulation to NP programs should focus on the effectiveness of simulation at bridging the theory-practice gap and how transferable the skills are to clinical practice and patient outcomes.³⁰⁷

6.3 Australian literature

There were only four primary research papers related to NP candidate education identified in the Australian literature. Two of the studies focused on educational interventions in the clinical setting^{309,310} and one related to the academic setting,³¹¹ one paper, identified in the previous section, underpinned the current standards of practice of NPs.²⁹⁴

In applying for endorsement as a NP in Australia, candidates are required to demonstrate clinical leadership. Leggatt and colleagues³⁰⁹ designed a leadership mentoring program for advanced practice nurses. The program was open to NP candidates working in funded NP positions. Expressions of interest were sought and twenty NP candidates were selected, two withdrew within the first few weeks. The NP candidates were mentored by senior nurses, some working in executive roles as directors of nursing and four were endorsed and experienced NPs. The program ran over 18-months and comprised three face-to-face workshops, monthly mentoring meetings, regular email contact and a participant evaluation of the program using a pre-post questionnaire that included the *Self-Report Leadership Practices Inventory* (30-item). The NP candidates reported improvement in their capacity to build relationships and confidence. Comparisons of the pre-post leadership inventory, identified improvements in eight domains of the *Inventory*, indicating improvements in capacity for leadership. The authors conclude that:

Our findings suggest that mentoring can assist nurses to transition to new roles and develop knowledge and skills in clinical leadership essential for advanced practice roles.^{309, p 1583}

Plath and colleagues³¹⁰ reported an evaluation of the pilot of an Australian emergency NP training program in a Queensland hospital emergency department. The training program involved one candidate and comprised four hours hospital-based training per week over two semesters, running concurrently with the NP candidate's university semesters, and three months clinical practice to consolidate skills, knowledge and attributes. Training was delivered

through a combination of online resources, presentations, readings, workshops and demonstrations. The report³¹⁰ provides a list of therapeutic interventions that the NP candidate is required to safely perform, including procedures such as suturing, digital nerve blocks and the removal of a foreign body. The motivation for establishing the training program was to augment the NP candidate's university-based study by providing regular clinically focussed education in the ED setting. The authors identified that:

Whilst the master's program provides a high level of generalised training, it has been increasingly recognised that these generic training standards need to be supplemented in order to support clinical knowledge and role development in specialty fields such as the Emergency Department.^{310, p 161}

In another study, Strand and colleagues³¹¹ sought to overcome the challenge of distance learning and assessment in their Queensland-based NP program, by using hand-held video cameras. The motivation for the study related to the challenges faced by NP program directors of engaging with NP students who might live several thousands of kilometres from the university. The study was abandoned prior to its completion, due to technical difficulties. In describing their motivation to conduct the study the authors highlight a valuable point that relates to the way in which NP candidates are currently expected to organise their own clinical mentors, who will have the responsibility of assessing their clinical performance. The authors state:

For assessment, the distance and external mode of course delivery impacts on the MNPractSt (Master of Nurse Practitioner Studies) Program Director's ability to personally verify the assessments that are made of students in geographically diverse locations and increases reliance on the clinical mentor's assessment of the student's performance. Personal video capture technology was proposed as an innovative solution to this problem.^{311, p 253}

Together, the above studies indicate a limitation of the current design of NP Master's programs in Australia, which is that the program leaves much of the responsibility for clinical skill development and assessment to the NP candidate to organise. The university provides very little direct support for this process, which means students recruit their own supervisors in the clinical setting and organise their own clinical learning in their workplace. The university offers oversight, but the practicalities of that oversight can be challenged by factors of geographical location and availability of university staff to engage with students.³¹¹ Consequently, standardisation of the skills, knowledge and attributes of NP graduates is unobtainable and unknown.

Table 17 Included reviews / studies with a focus on nurse practitioner candidates

Title/Reference	Description of the paper	Findings
Development of the NP Standards for Practice Australia. ²⁹⁴	Describes the development of the NP Standards for Practice in Australia. A mixed-methods design was used to engage stakeholders, including consumers and the nursing profession. Focus groups, interviews, surveys and work-based observation of NP practice.	The focus of the standards was clinically focussed attributes. The final NP standards framework comprised four standards (assesses using diagnostic capacity; plans care and engages others, prescribes and implements therapeutic interventions; monitors outcomes to evaluate and improve practice) with four domains; clinical, education, research, and leadership.
Developing clinical leaders: the impact of an action learning mentoring programme for advanced practice nurses. ³⁰⁹	Investigating the impact of a formal mentoring programme assists NP candidates to develop competence in clinical leadership. A pre-post longitudinal study design, 18 NP candidates and 17 senior nurses participated.	NP candidates reported improvements in leadership practices, in particular, transformational aspects of leadership, which is directly related to the NP clinical leadership standard. The authors concluded that 'mentoring can assist nurses to transition to new roles and develop knowledge and skills in clinical leadership essential for advanced practice roles.'
Evaluating an Australian emergency NP candidate training program. ³¹⁰	Evaluation of a work-based training program for NP candidates in an emergency department. The program involves a 12-month period, content delivered in the hospital setting and designed to augment candidates Master's of NP program.	The work placement during training allows for NP candidates to transition into NP role by reducing some of the occupational stressors such as familiarisation with the organisational structure and the requirements of the job, as well as the perceived need to be fully competent and knowledgeable in all aspects of the role upon graduation.
Using simulation for clinical practice hours in nurse practitioner education in the US: a systematic review. ³⁰⁶	To investigate and to synthesise research completed in the last five years to report the current state of the science related to simulation in NP education. 15 studies all from the US.	The quality of the studies and the interventions used made it difficult to draw firm conclusions. Outcomes reported an increase in knowledge, learner satisfaction and confidence. More rigorous studies with adequate sample sizes are required.
A pilot project in distance education: NP students' experience of personal video capture technology as an assessment method of clinical skills. ³¹¹	Hand-held video technology to facilitate assessment in remote locations. NP candidates (n=8) were equipped with hand-held video cameras and were required to video record themselves undertaking up to 5 clinical assessments and then upload these to a learning and management system.	The study was abandoned due to technical and administrative difficulties (ethics clearance). The study identified the potential for video assessments and also the associated challenges of recording assessments in this way.
A systematic review of the effectiveness of simulation-based education on satisfaction and learning outcomes in NP programs. ³⁰⁷	To synthesise the best available evidence about the effectiveness of high fidelity simulation within NP education programs worldwide. Ten studies were included, all from the US.	Studies identified an increase in satisfaction (3), enjoyment (3), enhancement of critical thinking (1) increase in knowledge (3), confidence (3), behaviour change (2), clinical competence (2). Future studies should focus on

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Title/Reference	Description of the paper	Findings
		measuring the transferability of the skills and knowledge learned through simulation to the clinical setting.

7 Summary of the results

7.1 Student registered nurses

Search results

- This review included 90 international reviews and 156 Australian studies on the topic of skill development for student RNs.
- The quality of the literature was mixed, with the main limitations being the paucity of large scale, multi-site experimental designs.
- The challenge of studying educational preparation of clinical skills is conducting studies that identify translation of learning into practice. Studies that attempted to do this often relied on self-reported data, and the inherent bias meant the results should be used with caution. Further, very few studies involved longitudinal follow-up, and therefore the long-term impacts of learning have not been explored.
- A number of different tools have been used to assess various approaches to learning and competency. While some of these were validated, others were investigator developed.

Clinical skills

- The wide range of skills discussed in the literature demonstrates the diverse role of RNs in contemporary clinical practice.
- Most studies and reviews focused on technical skills such as medication administration, identification of a deteriorating patient, indicating the acute-care focus of educational preparation. There was less emphasis on skills related to primary and community care or aged care.
- There was also an emphasis on non-technical skills, such as communication, resilience and empathy. This is interesting, because whilst nursing is fundamentally a practical profession, the development of non-technical skills is equally important to ensure a patient-centered approach to clinical practice.

Approaches to teaching and learning

- Whilst there are multiple factors that contribute to optimal learning, the focus of the studies included in this review has been towards the approaches to learning, including IPE, clinical placements and simulation.
- There is a definite shift in approaches to learning, towards using innovative methods of program delivery. Perhaps the most common approach was blended learning in terms of a combination of lectures, online resources, practical activities and simulation. There was evidence to support that most forms of learning were more effective than using didactic lectures only to deliver information. However, the heterogeneity of combinations of delivery within interventions makes it difficult to identify specifically which modalities derive the most impact on student learning.
- The evidence on the impact of IPE is unclear. Many nursing educational programs include some form of IPE in their content, although often this is optional and not assessed. The evidence around the impact of IPE is limited and is restricted to small-scale studies using

self-reported data. From the available evidence, it appears that students enjoy IPE activities and perceive them to be helpful in developing teamwork, communication and collaboration skills and to understand the roles of other health professionals. The impact of IPE on skills and knowledge acquisition, clinical practice and patient care is not clear.

Assessment of learning

- The most popular approach used to assess clinical skills are OSCEs.
- There is evidence to suggest that the assessment of students is inconsistent, with some assessors more and less lenient than others and some reluctant to fail students, particularly on clinical placement.

Clinical placement

- There was agreement across the literature that clinical placements are a fundamental component of the educational preparation of RNs.
- The increase in student numbers and the limited availability of clinical placements appeared to have re-vitalised research interest in clinical placements as a contributor to optimal skill development.
- A number of studies focused on student attitudes to placements in specific settings such as aged care, mental health, and primary care. These studies reported that students were often initially negative towards placements in these areas.
- Although the roles of the clinical facilitator and RN preceptor are crucial to the students' experience of the clinical placement, there is evidence that facilitators and preceptors receive limited preparation for the role.

Simulation

- Simulation has become a mainstream approach to education delivery and is used in many forms. The innovations identified in the Australian literature provided authentic real-life scenarios for students to engage with and make meaning from.
- The evidence regarding the fidelity of simulation was, to a degree conflicting, yet there was evidence to support the consideration that high and medium fidelity simulation are more effective than low fidelity forms.
- The substitution of clinical placements with simulation has been explored in the UK and the US.

7.2 Student enrolled nurses

- There is very limited literature around the factors affecting the optimal skill development of ENs and therefore it is difficult to draw any conclusions. This review included only three primary studies and no literature reviews relating to student ENs.
- Further research is required to better understand the educational needs of this group.

7.3 Nurse practitioner candidates

- Very few studies focused on the educational preparation of NPs and the factors affecting optimal skill development. This review included two international literature reviews and four primary studies relating to NP candidates.
- Australian studies identified the challenges of the current approach to the educational preparation of NPs and the onus that is placed on the NP candidate to organise clinical education that is related to their specialty, including the recruitment of appropriately qualified assessors in their clinical workplace.
- Further research is required to better understand the educational needs of this group.

8 Discussion

8.1 Student registered nurses

There was an extraordinary volume of literature available regarding the optimal skill development of student RNs and the literature perhaps raises as many questions as it answers. The diversity of the included reviews and studies, as well as the limitations of the quality of the literature, makes it challenging to draw definitive conclusions around the current trends and interventions utilised to develop clinical skills in pre-registration nursing programs.

The continuing acute care focus of nursing programs is a concern, particularly given the backdrop of rising demand for chronic and complex care and rapid growth in the primary health care nursing workforce in Australia. The apparent inconsistency in the content of Australian pre-registration programs is a potential threat to the capacity of new graduates to meet the challenges ahead of them. It also raises the question of what explicitly should the content of pre-registration programs contain?

Exposure to the clinical environment was considered a crucial component of the educational preparation of student RNs. Again, inconsistency was highlighted in students' exposure to specific clinical areas, such as aged care, intellectual disability, primary care and mental health. The literature highlighted a concern of whether student RNs will be adequately prepared to work in a range of clinical settings if they haven't been exposed to them as a student. This is important given the evidence that exposure to these areas changed students' perceptions of the setting. These questions are important given the projected shortfalls in the nursing workforce and the increase in chronic and complex care demand. In the most recent workforce surveillance document available - *Australia's Future Health Workforce – Nurses Detailed Report*,³¹² the projected shortfall of nurses in mental health in 2030 is 61%, this is the largest shortfall of all nursing specialties. The projected shortage of residential care nurses in 2030 is 26%.

The educational preparation of facilitators and preceptors was highlighted in the literature, as was the general attitude of clinical staff and their impact on student perceptions of their clinical placement experience. Multidisciplinary resources to support facilitators and preceptors are available, for example the *Clinical Supervision Handbook*³¹³ and the *National Clinical Supervision Competency Resource*.³¹⁴ Perhaps, standards for the facilitation and preceptorship of student RNs are to be considered. Such standards may enhance the consistency of preparation and further cement facilitation and preceptorship as components of the RN role.

The success of simulation to achieve skill and knowledge acquisition in a climate of limited clinical placements has led academics to consider whether simulation can be used as an alternative to clinical placement experiences. Whilst the benefits of simulation were demonstrated in this review, the impact of this substitution on the long term skills and knowledge acquisition and clinical practice are unclear. In comparison to other countries, Australia stipulates the least number of clinical placement hours for student RNs. Therefore, replacing clinical placement hours with simulation would need to consider this in terms of the overall impact on skills development.

In recent years, there has been an emergence of online Bachelor of Nursing programs. These programs deliver learning through online methods, with the exception of clinical practicums. No papers in this review reported outcomes data from such programs. Whilst they address the barriers of geographical distance and time management, they raise significant issues around quality and safety that have yet to be evaluated. There is also no evidence of preparation of academic staff to deliver completely online programs. These areas require further investigation.

8.2 Student enrolled nurses

There were no international literature reviews identified that related to the clinical skills development of student ENs, and only a small number of Australian studies. This indicates that this is an area requiring more research and investment to ensure best practice.

Historically the EN role was designed to support the RN, in undertaking specific tasks and procedures in clinical environments.³¹⁵ Education was therefore focused on the development of specific skills and the skills, knowledge and attributes required to undertake those specific tasks. The skills undertaken by ENs have advanced in recent years, and now the current skill set has broadened.²⁸² Although ENs are working under indirect supervision in some settings, particularly the community,³¹⁶ they are still legally required to work under the supervision of a RN. Given the developments of the EN role it has been argued that the current diploma level of education is no longer appropriate for ENs and that they should be educated to think critically,³¹⁷ a concept that is traditionally associated with university-level education.

In 1989, the UK disbanded the EN workforce as part of the *Project 2000* transition to one level of nursing qualification,³¹⁸ the RN, which was educated at diploma level. It has been suggested that the reason for disbanding the EN role was due to perceived overlap of roles between ENs and RNs. Following the recent *Raising the Bar, Shape of Caring: A review of the future education and training of RNs and care assistants*³¹⁹ the NMC have launched a new role, entitled 'Nurse Associate' which appears to be very similar to the Australian EN role. The nurse associate is educated through a two-year program provided at universities. The implementation of the nurse associate has been built into a career structure of nursing, enabling associates to undertake further education leading towards registration as a RN.

8.3 Nurse practitioner candidates

As was the case with ENs, there were very few papers identified that related to NP candidate skill development. Despite the lack of research on NP preparation, two of the Australian studies raised significant limitations of the current educational design of the NP programs in Australia that warrants further discussion. The current educational preparation of NPs in Australia includes Master's level preparation and the culmination of 5,000 clinical hours performed at an 'advanced practice level'.²⁹³ There is no specific guidance as to the competencies to be achieved in this 5,000 hours of practice. Therefore, the assumption inherent to this approach to educational preparation is that competence is achieved once a period of practice has been completed. The generic focus of the curriculum means that students undertaking the program have to adapt the curriculum to their own specialty area. The onus is then on the student to organise a clinical supervisor, to assess their practice and support them in developing the skills, knowledge and attributes required to perform as a NP in their chosen specialty. This current educational strategy means that, on completion of the Masters of NP program, each NP has an individual scope of practice. Even within specialty areas such as emergency nursing, or primary

care, there is significant variation between the scopes of practice performed by NPs.³²⁰ In Australia, there are now over fifty different NP specialties.³²¹ This quantity of specialist NPs presents challenges for education providers, and more importantly for workforce and industry in understanding the treatment and care that NPs are competent and educated to provide³²¹ and how to then employ them.

The growing demand for chronic and complex and primary health care in Australia has stimulated discussion as to whether NPs are adequately prepared to manage such demand. Since 2010, NPs in Australia have been eligible to provide care subsidised by the Medicare Benefits Schedule and the Pharmaceutical Benefits Scheme.³²² This legislation has facilitated the capacity of NPs to establish private practices in community settings and increase access to care for patients, particularly marginalised groups.³²³ One of the challenges for NPs who wish to provide primary or chronic and complex care, is that the structure of the current Master's of NP programs do not educate them with the necessary skills, knowledge and attributes,³²⁴ unless they are already working in that area of practice. This is because current Master's NP programs adopt a specialist approach to education in which the onus is upon the candidate to adapt the education provided to their specialty of practice.

It has been suggested that modifications be made to the current Master's NP programs to include more prescriptive generalist education, particularly relating to primary health care and chronic and complex health conditions, that will enable NPs to work more broadly once endorsed.³²⁴ Perhaps a review of the structure of NP education in Australia ought to be considered, and an alternative approach explored that may assist in preparing NPs with a generalist education that facilitates standardisation of scopes of practice. Transparency of NP scope would surely assist workforce development and enable the health service sectors to better utilise NPs to address the current and future health needs of Australian communities.

The impact of NPs in the US has been extraordinary, particularly in primary health care. In the US, there are approximately 234,000 NPs³²⁵ and the generalist educational preparation of NPs means that most (89.2%) have been educationally prepared and certified to manage primary care presentations.³²⁵ The contribution of NPs to primary care is apparently so profound that the US health care system could not operate effectively without them,³²⁴ and thereby demonstrates the potential of a NP workforce to increase access to care for patients. For this to occur in Australia, it is proposed that the quantity of privately practising NPs would need to increase and the educational preparation would need to be developed to prepare NPs with a more generalist focus.

8.4 Recommended issues for further consultation

This review of the literature has identified issues that warrant further consultation. The following questions are provided to inform that consultation:

- How can we best articulate the skills, knowledge and attributes that graduate ENs, RNs and NPs are to be educated to possess?
- Which skills, knowledge and attributes should be prioritised in the educational preparation of student ENs, student RNs and NP candidates?
- In the US, simulation has been substituted for a proportion of student RNs clinical placement. There is currently no Australian evidence to demonstrate the effectiveness of

this approach. How is the substitution of simulation for clinical placements viewed by the profession?

- How are nurse academics currently prepared to deliver simulation? What should be the educational preparation for those who deliver education using simulation?
- The educational preparation of clinical facilitators and RN preceptors appears inconsistent. What is the optimal approach to preparing facilitators and preceptors to support, supervise and assess students on clinical placement? What resources are required to provide this preparation?
- In recent years there has been a move to several fully online nursing preparation programs. No literature was identified that evaluated the quality of learning in such programs and its impact on skill development. What are the experiences with these programs? What preparation have academic staff been given to deliver fully online preparation for practice programs?
- What are the challenges and facilitators of incorporating IPE in nursing preparation programs? How might these be overcome?

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Appendix 2 Search strategy and search terms

Step 1: International Literature Search

Search Terms	Database
("Clinical skills" or "clinical competence" or "clinical placement" or simulation or "inter professional learning" or "interprofessional education" or "clinical assessment" or "peer learning" or "educational theory" or teamwork or communication or leadership) AND ("student RN" or "pre-regist* nurse" or "baccalaureate nurse" or "undergraduate nurse") AND (literature review or review of the literature or overview or systematic review or meta analysis) Limiters- Published Date: 2012 01 01-2019 12 31 Language: - english	CINAHL Medline Health Source: Nursing ERIC SCOPUS Cochrane JBI
("Clinical skills" or "clinical competence" or "clinical placement" or simulation or "interprofessional learning" or "interprofessional education" or "clinical assessment" or "peer learning" or "educational theory" or teamwork or communication or leadership) AND ("EN" OR "endorsed EN" OR "registered practical nurse") AND (literature review or review of the literature or overview or systematic review or meta analysis) Limiters- Published Date: 2012 01 01-2019 12 31 Language: - english	CINAHL Medline Health Source: Nursing ERIC SCOPUS Cochrane JBI
("Clinical skills" or "clinical competence" or "clinical placement" or simulation or "inter professional learning" or "interprofessional education" or "clinical assessment" or "peer learning" or "educational theory" or teamwork or communication or leadership) AND ("transitional NP" or "NP candidate" or "advanced practice nurse") AND (literature review or review of the literature or overview or systematic review or meta analysis) Limiters- Published Date: 2012 01 01-2019 12 31 Language: - english	CINAHL Medline Health Source: Nursing ERIC SCOPUS Cochrane JBI

Step 2: Australian Literature Search

Search Terms	Database
EN OR enrolled endorsed nurse OR student RN OR pre-registration nurse OR baccalaureate nurse OR undergraduate nurse OR transitional NP OR NP candidate OR advanced practice nurse AND Australia combined with: Clinical Skill Clinical competence Patient simulation Interprofessional learning Clinical assessment Peer learning Educational theory Teamwork OR leadership OR communication	Scopus Medline

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Search Terms	Database
EN OR enrolled endorsed nurse OR diploma nurse OR student RN OR pre-registration nurse OR baccalaureate nurse OR undergraduate nurse OR transitional NP OR NP candidate OR advanced practice nurse AND Australia combined with: Clinical skills OR nursing skills Clinical competence OR student placement OR clinical placement Patient simulation OR simulations Interdisciplinary education Educational theory Clinical assessment OR peer learning OR Teamwork OR communication OR leadership	CINAHL
("Clinical skills" OR "clinical competence" OR "clinical placement" OR simulation OR "interprofessional learning" OR "interprofessional education" OR "clinical assessment" OR "peer learning" OR "educational theory" OR teamwork OR communication OR leadership) AND (australia or australian) AND ("student RN" OR "pre-regist* nurse" OR "baccalaureate nurse" OR "undergraduate nurse")	Health Source Nursing

Appendix 3 Journal impact report

Journals are listed alphabetically with journal impact factors/scores and category rankings.

Journal title	JCR impact factor ¹	JCR ranking ¹	JCR category ¹	CITE SCORE ²	CITESCORE Ranking ²	CITESCORE Category ²
Advances in Health Sciences Education	2.552	28/239 7/41	EDUCATION & EDUCATIONAL RESEARCH EDUCATION, SCIENTIFIC DISCIPLINES	2.18	85/979	EDUCATION
Australasian Emergency Nursing Journal	Not ranked	N/A	N/A	1.40	3/23	EMERGENCY
Australian Critical Care	1.930	13/115 14/118	NURSING (SSCI) NURSING (SCIE)	1.30	3/18 4/23	CRITICAL CARE EMERGENCY
Australian Journal of Advanced Nursing	0.511	106/115 109/118	NURSING (SSCI) NURSING (SCIE)	0.70	18/50 51/104	ADVANCED AND SPECIALISED NURSING GENERAL NURSING
Australian Journal of Rural Health	0.858	82/115 85/118	NURSING (SSCI) NURSING (SCIE)	0.74	14/33 320/478	FAMILY PRACTICE PUBLIC HEALTH, ENVIRONMENTAL AND OCCUPATIONAL HEALTH
Australian Nursing and Midwifery Journal	Not ranked	N/A	N/A	0.05	679/841	GENERAL MEDICINE
BMC Medical Education	1.511	101/239 21/41	EDUCATION & EDUCATIONAL RESEARCH EDUCATION, SCIENTIFIC DISCIPLINES	1.71	162/979	EDUCATION
BMC Palliative Care	2.335	19/79 37/94	HEALTH POLICY & SERVICES HEALTH CARE SCIENCES & SERVICES	2.37	42/841	GENERAL MEDICINE
British Journal of Community Nursing	Not ranked	N/A	N/A	0.37	24/32	COMMUNITY AND HOME CARE

Journal title	JCR impact factor ¹	JCR ranking ¹	JCR category ¹	CITE SCORE ²	CITESCORE Ranking ²	CITESCORE Category ²
Clinical Simulation in Nursing	1.640	29/115 32/118	NURSING (SSCI) NURSING (SCIE)	1.31	3/19 246/979	NURSING (MISCELLANEOUS) EDUCATION
Collegian	1.153	60/115 63/118	NURSING (SSCI) NURSING (SCIE)	1.32	22/104	GENERAL NURSING
Contemporary Nurse	0.673	97/115 100/118	NURSING (SSCI) NURSING (SCIE)	0.90	43/104	GENERAL NURSING
European Journal of Clinical Investigation	3.086	32/155 57/133	MEDICINE, GENERAL & INTERNAL MEDICINE, RESEARCH & EXPERIMENTAL	2.63	41/119 159/398	CLINICAL BIOCHEMISTRY BIOCHEMISTRY
Health Information and Libraries Journal	1.190	44/88	INFORMATION SCIENCE & LIBRARY SCIENCE	1.02	50/202 39/62	LIBRARY AND INFORMATION SCIENCES HEALTH INFORMATICS
Illness, Crisis and Loss	Not ranked	N/A	N/A	0.35	196/241 626/1029	HEALTH (SOCIAL SCIENCE) SOCIOLOGY & POLITICAL SCIENCE
International Journal of Mental Health Nursing	2.033	11/115 12/118	NURSING (SSCI) NURSING (SCIE)	1.93	6/37	PSYCHIATRIC MENTAL HEALTH
International Journal Of Nursing Education Scholarship	Not ranked	N/A	N/A	1.13	301/979 33/104	EDUCATION GENERAL NURSING
International Journal Of Nursing Practice	1.142	62/115 65/118	NURSING (SSCI) NURSING (SCIE)	1.14	31/104	GENERAL NURSING
International Journal of Nursing Studies	3.656	1/118 1/115	NURSING (SSCI) NURSING (SCIE)	3.50	3/104	GENERAL NURSING
International Journal of Online Engineering	Not ranked	N/A	N/A	0.42	172/270	GENERAL ENGINEERING
ISRN Nursing	Not ranked	N/A	N/A	Not ranked	N/A	N/A
International Nursing Review	1.496	33/115 37/118	NURSING (SSCI) NURSING (SCIE)	1.49	19/104	GENERAL NURSING

Journal title	JCR impact factor ¹	JCR ranking ¹	JCR category ¹	CITE SCORE ²	CITESCORE Ranking ²	CITESCORE Category ²
Issues in Mental Health Nursing	0.825	86/115 89/118	NURSING (SSCI) NURSING (SCIE)	0.76	19/37	PSYCHIATRIC MENTAL HEALTH
JB I Database Of Systematic Reviews And Implementation Reports	Not ranked	N/A	N/A	0.46	62/104	GENERAL NURSING
Journal of Advanced Nursing	2.267	7/118 7/115	NURSING (SSCI) NURSING (SCIE)	2.37	6/104	GENERAL NURSING
Journal of Allied Health	Not ranked	N/A	N/A	0.64	336/478	PUBLIC HEALTH, ENVIRONMENTAL AND OCCUPATIONAL HEALTH
Journal Of Clinical Nursing	1.635	30/115 33/118	NURSING (SSCI) NURSING (SCIE)	1.71	15/104	GENERAL NURSING
Journal Of Nursing Education	1.185	56/115 59/118	NURSING (SSCI) NURSING (SCIE)	1.04	333/979 37/104	EDUCATION GENERAL NURSING
Journal of Nursing Education and Practice	Not ranked	N/A	N/A	Not ranked	N/A	N/A
Journal of Nursing Management	1.912	15/115 16/118	NURSING (SSCI) NURSING (SCIE)	2.03	1/29	LEADERSHIP AND MANAGEMENT
Journal for Nurse Practitioners (JNP)	0.487	110/115 113/118	NURSING (SSCI) NURSING (SCIE)	0.28	31/50	ADVANCED AND SPECIALISED NURSING
Journal of Nursing Regulation	Not ranked	N/A	N/A	1.21	8/35 5/19	ISSUES, ETHICS AND LEGAL ASPECTS NURSING (MISCELLANEOUS)
Journal of the American Academy of Nurse Practitioners	1.136	64/115 67/118	NURSING (SSCI) NURSING (SCIE)	1.05	36/104	GENERAL NURSING
Medical education	4.405	2/41 9/94	EDUCATION, SCIENTIFIC DISCIPLINES HEALTH CARE SCIENCES & SERVICES	1.83	130/979	EDUCATION

Journal title	JCR impact factor ¹	JCR ranking ¹	JCR category ¹	CITE SCORE ²	CITESCORE Ranking ²	CITESCORE Category ²
Medical Teacher	2.450	8/41 31/94	EDUCATION, SCIENTIFIC DISCIPLINES HEALTH CARE SCIENCES & SERVICES	1.44	216/979	EDUCATION
Nurse Education In Practice	1.313	47/115 50/118	NURSING (SSCI) NURSING (SCIE)	1.54	18/104 199/979	GENERAL NURSING EDUCATION
Nurse Education Today	2.067	10/118 10/115	NURSING (SSCI) NURSING (SCIE)	2.11	8/104 92/979	GENERAL NURSING EDUCATION
Nursing and Health Sciences	1.237	53/115 56/118	NURSING (SSCI) NURSING (SCIE)	1.31	23/104	GENERAL NURSING
Nursing Education Perspectives	Not ranked	N/A	N/A	1.21	27/104 269/979	GENERAL NURSING EDUCATION
Nursing Outlook	2.425	4/118 4/115	NURSING (SSCI) NURSING (SCIE)	1.73	12/104	GENERAL NURSING
Nursing Standard	Not ranked	N/A	N/A	0.08	614/841	GENERAL MEDICINE
Policy, Politics, and Nursing Practice	Not ranked	N/A	N/A	1.04	9/29 14/35	LEADERSHIP AND MANAGEMENT ISSUES, ETHICS AND LEGAL ASPECTS
Revista de Enfermagem Referência	Not ranked	N/A	N/A	Not ranked	N/A	N/A
Western Journal of Nursing Research	1.323	44/115 48/118	NURSING (SSCI) NURSING (SCIE)	1.07	35/104	GENERAL NURSING
Work based learning in primary care	Not ranked	N/A	N/A	Not ranked	N/A	N/A
Worldviews on Evidence-Based Nursing	2.143	8/118 8/115	NURSING (SSCI) NURSING (SCIE)	2.35	7/104	GENERAL NURSING

¹Journal Citation Reports 2017. Available from [InCites Journal Citation Reports website](https://jcr.incites.thomsonreuters.com)¹

²CiteScore™ 2017. Available from [Scopus website](https://www-scopus-com.ezproxy.uow.edu.au/sources.uri?zone=TopNavBar&origin=sbrowse)²

³Emerging Sources Citation Index. Available from [Clarivate Analytics website](http://mjl.clarivate.com/cgi-bin/jrnlst/ilresults.cgi?PC=EX)³

¹ <https://jcr.incites.thomsonreuters.com>

² <https://www-scopus-com.ezproxy.uow.edu.au/sources.uri?zone=TopNavBar&origin=sbrowse>

³ <http://mjl.clarivate.com/cgi-bin/jrnlst/ilresults.cgi?PC=EX>

Journal Citation Report (JCR) impact factor

The JCR impact factor shows how often the average article is cited in a given journal, based on a two-year window. JCR impact factor uses Web of Science data.

2017 Journal Impact Factor = (2017 citations to items in 2016 + 2017 citations to items in 2015) / (citable items in 2016 + citable items in 2015).

More information: [View the Journal Citation Reports: A Primer on the JCR and Journal Impact Factor \(PDF, 344Kb\)](#)⁴

CiteScore

CiteScore shows how often the average article is cited in a given journal, based on three-year window. CiteScore uses Scopus data.

2017 CiteScore = Citation count 2017 / Documents published 2014 – through to 2016

More information: [Journal Metrics - FAQs website](#)⁵

⁴ https://clarivate.com/wp-content/uploads/2017/10/JCR_Primer.pdf

⁵ <https://journalmetrics.scopus.com/index.php/Faqs>

Glossary of terms

Term	Definition
Blended learning	Blended learning refers to an educational approach that combines traditional classroom face-to face methods with online materials and activities. ⁸³
Clinical placement	A generic term for a non-academic training post filled by a doctor or other health professional. ³²⁶ Clinical placement in undergraduate nursing education is used to consolidate knowledge learnt by students in the university environment through exposure to clinical environments across a range of settings. ¹⁸¹
Clinical reasoning	Clinical reasoning is “the process by which nurses collect cues, process the information, come to an understanding of a patient problem or situation, plan and implement interventions, evaluate outcomes, and reflect on and learn from the process.” ³²⁷
Critical thinking	Critical thinking is the methodical and logical process in which we analyse an issue. ¹⁰
Cultural competence	Cultural competence is the ability to participate ethically and effectively in personal and professional intercultural settings. It requires being aware of one’s own cultural values and world view and their implications for making respectful, reflective and reasoned choices, including the capacity to imagine and collaborate across cultural boundaries. ³²⁸
Debriefing	A formal, collaborative, reflective process within the simulation learning activity. ³²⁹
Emotional intelligence	Emotional intelligence (EI) involves the ability to perceive and effectively use self and others' emotions, and to integrate emotion to facilitate thinking, and understand and regulate emotions to promote personal development (Birks et al. ³³⁰ cited in Foster et al. ⁵⁹).
Enrolled Nurse (EN)	<p>The enrolled nurse works with the registered nurse as part of the health care team and demonstrates competence in the provision of person-centred care. Core practice generally requires the EN to work under the direct or indirect supervision of the RN...ENs engage in analytical thinking, use information and/or evidence, and skilfully and empathetically communicate with all involved in the provision of care, including the person receiving care and their family and community and health professional colleagues. Also known in other countries as:</p> <ul style="list-style-type: none"> ▪ Diploma Nurse ▪ Diploma-Prepared Nurse ▪ Licensed Practical Nurse ▪ Licenced Vocational Nurse ▪ Practical Nurse ▪ Registered Practical Nurse.
Facilitator	An individual that helps to bring about an outcome (such as learning, productivity, or communication) by providing indirect or unobtrusive assistance, guidance, or supervision. ³²⁹
Fidelity	The degree to which the simulation replicates the real event and/or workplace; this includes physical, psychological, and environmental elements. ³²⁹
Flipped classroom	The flipped classroom is a hybrid approach to learning, using technology to move the classroom lecture to “homework” status and using face-to-face classroom time for interactive learning, e.g. students watch a video recorded lecture outside classroom while classroom time is spent in discussion, clarification, exercises or other learning activities to enhance application of knowledge. ^{331,332}

Term	Definition
High fidelity simulation	Simulation experiences that are extremely realistic and provide a high level of interactivity and realism for the learner. ³³³
Immersion	Describes the level to which the learner becomes involved in the simulation; a high degree of immersion indicates that the learner is treating the simulation as if it was a real-life (or very close to real-life) event. ³³³
Interdisciplinary	Integrating the perspective of professionals from two or more professions by organizing the education around a specific discipline, where each discipline examines the basis of their knowledge. ³³⁴
Interprofessional	Collaborating as a team with a shared purpose, goal, and mutual respect to deliver safe, quality health care. ^{335,336}
Low fidelity simulation	Not needing to be controlled or programmed externally for the learner to participate; ³³⁷ examples include case studies, role playing, or task trainers (airway mannequin) used to support students or professionals in learning a clinical situation or practice. ³²⁹
National Council Licensure Examination (NCLEX)	A nationwide exam for the licensing of nurses in the US and Canada that is administered by the National Council of State Boards of Nursing.
Non-technical skills	In the health care field, the skills of communication, (patient- provider, team) leadership, teamwork, situational awareness, decision making, resource management, safe practice, adverse event minimization/mitigation, and professionalism; also known as behavioural skills or teamwork skills. ³³⁸
Nurse Practitioner (NP)	The nurse practitioner is an advanced practice nurse endorsed by the Nursing and Midwifery Board of Australia who has direct clinical contact and practises within their scope under the legislatively protected title 'nurse practitioner' under the National Law. ³³⁹ Also known as an Advanced Practice Nurse (note there is inconsistency in the use of this title and can also refer to RNs who perform at a high level).
Objective Structured Clinical Examination	An approach to the assessment of clinical or professional competence in which the components of competence are assessed in a planned or structured way with attention being paid to the objectivity of the examination. ³⁴⁰
Pre-brief	An information or orientation session held prior to the start of a simulation activity in which instructions or preparatory information is given to the participants. The purpose of the prebriefing is to set the stage for a scenario, and assist participants in achieving scenario objectives. ³²⁹
Preceptor	The role of the preceptor is that of a paid employee of the health service (but not the education provider/university), such as an RN, who has the responsibility to teach and assess undergraduate student nurses during their clinical placement. ¹⁹²
Registered Nurse (RN)	RN practice is person-centred and evidence-based with preventative, curative, formative, supportive, restorative and palliative elements. ²⁸ Also known in other countries as: <ul style="list-style-type: none"> ▪ Baccalaureate-Prepared Nurse ▪ Baccalaureate Nurse
Serious Games	A mental contest played with a computer in accordance with specific rules, which uses entertainment to further training, education, health, public policy, and strategic communication objectives. ³⁴¹
Simulation	A technique that creates a situation or environment to allow persons to experience a representation of a real event for the purpose of practice, learning, evaluation, testing, or to gain understanding of systems or human actions. ³²⁹

Term	Definition
Standardised patient	An individual trained to portray a patient with a specific condition in a realistic, standardized, and repeatable way and where portrayal/presentation varies based only on learner performance; this strict standardization of performance in a simulated session is what can distinguish standardized patients from simulated patients. ³²⁹
Team based learning	A learning method which makes use of small group discussion and collaborative, self-directed study to foster new learning as opposed to imparting information. After a period of preliminary individual accountability, teams of learners compete with each other to learn information and solve problems. This is in distinction to traditional learning in which information is imparted from teacher to learner. ³²⁹
Technical skills	In health care, the knowledge, skill, and ability to accomplish a specific medical task; for example, inserting a chest tube or performing a physical examination. ³²⁹
Virtual reality	A computer-generated three-dimensional environment that gives an immersion effect. ³²⁹