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The Future Shape of the Nursing Workforce: A Synthesis of the Evidence of Factors that Impact on Quality Nursing Care

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THE UNIVERSITY OF SYDNEY

The Future Shape of the Nursing Workforce: A Synthesis of the Evidence of Factors that Impact on Quality Nursing Care.

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The Future Shape of the Nursing Workforce: A Synthesis of the Evidence of Factors that Impact on Quality Nursing Care

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FOREWORD

It is extremely gratifying to see the outcome of this umbrella review - a very important document for nursing.

The genesis for this work was the concern of an informal group of nurse leaders who came together to have deep conversations about our nursing future. It was clear that in order to influence the direction of health care and nursing's future we needed to know what the research had to tell us.

We are grateful to the Department of Health and Ageing (DoHA) for funding this project which it is hoped will provide the evidence base for future health and nursing policy directions.

We are indebted also to Professor Alison Kitson and her team from the University of Adelaide for this excellent and rigorous work. This is just the beginning of what we are confident is going to become an important roadmap for the future of nursing in Australia.

Professors Jill White and Iain Graham on behalf of the Nursing Futures Group.

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We would like to acknowledge Professor Iain Graham and Professor Jill White, who initiated and led the initial meetings of the Nursing Futures Group. It was from these debates that the need for a review of the evidence around what makes a positive environment for nursing was highlighted. This led to the commissioning of the current umbrella review.

Also, we would like to thank all members of the Nursing Futures Group for fruitful discussions and support of this work and particularly those who participated in the September workshop in Adelaide, in this report referred as the Expert Reference Group (Appendix I: Expert Reference Group). Their experiences contributed to shaping the recommendations for policy and education within the document, as well as confirming the results of the umbrella review.

We acknowledge the Department of Health and Ageing for funding this project and for their collaborative support and constructive feedback during the work with the umbrella review.

CONTENTS

FOREWORD II
ACKNOWLEDGEMENTS III
CONTENTS IV
ABBREVIATIONS V
DEFINITIONS VI
EXECUTIVE SUMMARY 1
Background 1
Method 1
Results 1
Conclusion 4
INTRODUCTION 6
Background 6
METHOD 10
Study characteristics 10
RESULTS 13
MAIN RESULTS 15
Results relating to Context 15
Results relating to Organisation of Nursing/Midwifery 21
Results relating to Education and Continuing Professional Development 29
Results relating to the Nurse/Midwife-patient relationship 33
DISCUSSION 36
Context 36
CONCLUSIONS 46
REFERENCES 50
APPENDICES 55
Appendix I: Expert Reference Group 56
Appendix II: Critical appraisal tool 57
Appendix III: Data extraction tool 58
Appendix IV: Included systematic reviews 59
Appendix V: Excluded systematic reviews 89

List of Figures

Figure 1 Summary of subthemes and number (n=) of systematic reviews within each theme 13
Figure 2 The description of the inclusion/ exclusion process 14

ABBREVIATIONS

Abbreviation	Term
CPD	Continuing professional development
CRD	Centre for Reviews and Dissemination
CINAHL	Cumulative Index to Nursing and Allied Health Literature
EBP	Evidence-based practice
EU	European Union
FP	For-profit
FTE	Full time equivalent
GP	General Practitioner
HWA	Health Workforce Australia
ICN	International Council of Nurses
IOM	Institute of Medicine
IPE	Inter-professional education
JBI	Joanna Briggs Institute
LPN	Licensed practical nurse
NFP	Not-for-profit
NP	Nurse Practitioner
NSPO	Nursing sensitive patient outcomes
PBL	Problem-based learning
PD	Professional development
RCT	Randomised controlled trials
RN	Registered Nurse
SUMARI	System for the unified management, assessment and review of information
WHO	World Health Organization

DEFINITIONS

Transformational leadership: A leadership style that focuses on the contribution of team members to achieve success using inspiration and motivation.

Transactional leadership: A leadership style where the leader engages the team through exchange and team members are rewarded for meeting goals.

Consultative leadership: A leadership style that is outcome oriented incorporating, the views of team members.

Participatory leadership: An inclusive style of leadership where all team members are encouraged to participate particularly in terms of goal setting and planning.

Social leadership: A leadership style that focuses on getting the team motivated and excited about the task at hand rather than focussing on the task itself.

Instrumental leadership: Is goal oriented where team building is used to achieve the goal or task.

Moral distress: distress arising when nurses are unable to take action that they believe is morally correct.

Ethical distress: distress arising when nurses are unable to take action that they believe is ethically correct.

Nurse-led units: A service where the nurses have the clinical leadership.

EXECUTIVE SUMMARY

BACKGROUND

To effectively respond to the growing demand for healthcare, governments need to consider how to recruit and retain their healthcare staff. This challenge is recognised by the nursing and midwifery professions.

This umbrella review, supported by a group of nurse leaders in Australia, aimed to identify those elements known to support a high quality workforce by drawing on the best available Australian and international evidence. The findings provided recommendations that relate to practice, research, education and policy initiatives to help shape the future nursing workforce in Australia and internationally.

METHOD

An umbrella review of published systematic reviews was undertaken focusing on the Australian and international evidence for factors that are known to impact upon the ability of nurses and midwives to deliver high quality patient care.

A total of 79 systematic reviews published between 1995 and 2012 met the inclusion criteria and of these 50 were considered of sufficient quality and were included in the results.

RESULTS

Five review questions were constructed and the results and key recommendations for each are presented below with a link to the relevant section.

1. **What factors related to the *context of care* influence the nurse's and midwife's ability to provide quality patient-centred care?**
   Context is defined as all the elements that make up the environment where patient care is delivered. The review identified several factors in relation to context that impact on the nurse's and midwife's ability to provide quality patient-centred care. These factors include leadership, inter-professional practice, autonomy, teamwork, support systems and structures, evidence-based practice, appropriate staffing levels, and cultural competence. This composition of factors has been described in the international literature as a positive practice environment. These factors directly influence the environment in which nurses provide care and as a consequence impact on recruitment and retention rates, but more importantly upon nurses' wellbeing and ultimately patient outcomes.

   Key recommendations based on the evidence from the included reviews:

   - Nurse leaders in Australia need to identify the elements of the positive practice environment which need immediate attention in order to improve recruitment and retention rates and patient care. (Refer to Positive Practice Environment)
   - Strategies at national, state and organisational level to improve recruitment and retention rates must be based on plans to develop positive practice environments in all healthcare settings. (Refer to Positive Practice Environment)

- The current professional nursing workforce must be developed through education and professional development activities, which prioritise leadership, cultural competence and inter-professional teamwork. (Refer to Leadership, Cultural Diversity, Inter-Professional Practice)
- Nurses must have the authority to make decisions relating to the delivery of care at every level of the healthcare system. (Refer to Autonomy of Practice)
- System-wide structures and support for evidence based practice must be implemented. (Refer to Support Systems and Structures)
- Further research is required to identify the evidence base for specific teamwork practices within nursing and with other health disciplines. (Refer to Working in teams)
- Further research is required to understand the elements of the positive practice environment for Aboriginal and Torres Strait Islander patients and nurses. (Refer to Cultural Diversity)

2. **What factors related to the way nursing and midwifery *is organised* influence the nurse's and midwife's ability to provide quality patient-centred care?**

   When considering resources, there is no doubt the evidence supports a clinical and statistical association between increased registered nurse staffing and improved patient outcomes. There is also good evidence that increased ratios of registered nurses compared to less qualified staff leads to shorter stays in hospital and decreased adverse events. Evidence indicates self scheduling of rosters may decrease staff turnover. The optimal duration of shift length was examined and shift lengths of over 12 hours are associated with increased errors but shift length generally does not appear to be related to the quality of patient care, stress and job satisfaction.

   Nurse-led care was supported for some conditions including hypertension and cardiovascular disease. Evidence examining midwife-led care demonstrates improved patient outcomes. Nursing and midwifery generate greater patient compliance with treatment recommendations, greater patient satisfaction and resolution of pathological conditions compared to standard care (in these cases care delivered by medical practitioners).

   Key recommendations based on the evidence from the included reviews:

   - In developing workforce strategies, planners must take account of the decrease in quality of patient care that is directly associated with the substitution of registered nurses in the acute care setting. (Refer to Staffing)
   - Research is required to determine optimal staffing levels and skill mix and the relationship between these and the quality of patient care across all care settings. (Refer to Skill mix)
   - Models of care including team midwifery, nurse-led and midwife-led care should be actively supported and incorporated into evolving models of care delivery. (Refer to Primary Nursing Care and Team Models of Care)
   - Nationally consistent nursing sensitive patient outcome measures must be developed to evaluate the contribution of nursing care to patient outcomes. (Refer to Staffing)
   - The cost effectiveness of nursing, including emerging roles, nurse practitioners and nurse midwives requires further research. (Refer to Emerging roles, Nurse Practitioners/Nurse Midwives)
   - Research is required to investigate the association between shift length and the quality of patient outcomes and the impact on nurses. (Refer to Rostering)

- Further research is required to identify appropriate patient populations who would benefit most from nurse-led units. Admission criteria for the selection of individual patients into nurse-led units also needs to be clarified. (Refer to Nurse/Midwife-led care)
- Further research is required to discover how nurses best implement practice guidelines. (Refer to Guidelines for practice)

3. **What factors related to *educational preparation* influence the nurse's and midwife's ability to provide quality patient-centred care?**
   AND
4. **What factors related to the *career opportunities and continuing professional development (CPD) opportunities* influence the nurse's and midwife's ability to provide quality patient-centred care?**

   There was a paucity of reviews covering undergraduate preparation (question 3) and the impact of continuing professional development on nursing and midwifery competence (question 4).

   Educational programs (simulations and the different type of curricula) need to measure the effect of their interventions on the student's ability to actually implement skills and knowledge after they have finished their program of study. Simulations have the potential to increase student confidence in their own abilities and enable them to work on skills within a range of contexts. Simulation has the potential to be useful for skill development at least in the short term. There were no reviews of the effect of different approaches to managing undergraduate nursing students' clinical placement experiences.

   Reviews covering the impact of CPD programs on qualified nursing and midwifery skills and knowledge were sparse. For those that were included, it was clear that CPD programs need to be structured to address specific areas of understanding and incorporate adult learning needs.

   Key recommendations based on the evidence from the included reviews:

   - Research is urgently required to review clinical placement approaches for undergraduate nursing students. (Refer to Education Curriculum)
   - Simulation as a concept needs to be clearly defined and the goals of using such learning processes need to be explicitly stated and measured. (Refer to Simulated Learning)
   - The differences between nursing curricula need to be clear and the outcomes of these different approaches evaluated in relation to their effect on student learning and patient care. (Refer to Education Curriculum)
   - Research is required on inter-professional education which investigates the effects of cohort characteristics (such as student numbers and professional mix) on learning outcomes. (Refer to Inter-Professional Education (IPE))
   - Professional development programs require greater focus on work based problem solving and more effective ways of evaluating the programs impact. (Refer to Continuing Professional Development)
   - Organisations must deliver CPD programs which enable nurses to create and maintain a positive practice environment and work proactively with nurses to improve patient outcomes. (Refer to Continuing Professional Development)

5. **What factors related to the *way nurses, midwives and patients interact in the direct care encounter* influence the nurse's and midwife's ability to provide quality patient-centred care?**

   Few systematic reviews relating to how nurses and patients effectively interacted to promote patient-centred care were identified. A patient-centred care approach supports involvement of patients in their basic care needs (termed the Fundamentals of Care) and in the decision-making procedure. Only one review that related to patients' fundamental care needs was identified. This care need was communication.

   Other reviews that explored nurse-patient interactions were linked to the development and use of Nursing Sensitive Patient Outcomes (outcomes significantly impacted by nursing care) to evaluate patient-centred care. Nursing Sensitive Patient Outcomes have been discussed under question 2 but those reviews identified under this question specifically address the patient's perspective.

   The findings from these reviews indicate that there is a complex interplay of interpersonal factors between nurses and patients (and their families) which impact upon the efficacy of communication. Furthermore this relationship is also influenced by the organisation and context in which the relationship develops. Organisational structure and the relationships between staff play an important role in either facilitating or creating barriers to relationships between staff and patients. This review demonstrates the lack of attention being paid to other fundamental aspects of patient care (such as meeting patients' needs for dignity, respect, comfort, safety, pain management, and other basic or fundamental needs). This deficit in the literature may also reflect why it continues to be a challenge to develop robust sets of Nursing Sensitive Patient Outcome measures.

   Key recommendations based on the evidence from the included reviews:

   - Research is required to investigate the effect of nurses' communication styles on patient outcomes in terms of patient-centred care. (Refer to Fundamentals of Care)
   - Evaluation of how patient centred communication skills are taught in the undergraduate and postgraduate nursing curricula should occur. (Refer to Fundamentals of Care)
   - Further research into the Fundamentals of Care and the nurse's role in improving patient outcomes in these areas is urgently required. (Refer to Fundamentals of Care)
   - Nationally consistent Nursing Sensitive Patient Outcome measures must be developed to evaluate the contribution of nursing care to patient outcomes. (Refer to Nursing Sensitive Patient Outcomes , Staffing)

CONCLUSION

The purpose of this umbrella review was to identify the evidence base for factors that would contribute to building the future nursing workforce in Australia. We found strong evidence indicating if the context where nurses and midwives work is conducive, then the results will be good for patients and good for nurses and midwives. We also found compelling evidence for building the future nursing workforce around the registered nurse role. This was demonstrated in terms of improved patient safety, quality of care and patient outcomes.

The review identified the following areas for immediate action and reform:

Autonomy of practice; adequate educational preparation of the nursing workforce, support for nurses both in terms of personnel and infrastructure support and the development and

standardisation of Nursing Sensitive Patient Outcomes. The development of standardised metrics must be embraced as a national priority as it will then enable health policy makers and economists to more clearly identify cost effective interventions and strategies.

There is a compelling case for further investment in rigorous evaluation of nursing educational programs at undergraduate level and for continuing professional development initiatives. Central to this is the evaluation of clinical simulation approaches, different curriculum designs and testing the effectiveness of interdisciplinary education approaches.

Finally, perhaps the most surprising finding was where the gaps in the existing evidence resided. From an Australian perspective, it was noteworthy that no reviews were identified that looked at Aboriginal and Torres Strait Islander peoples' experiences of healthcare nor was there any reference made to particular issues around cultural safety/competence. The second significant gap was in the evidence base around the Fundamentals of Care. This is noteworthy given the universal prevalence of such needs as hygiene, safety, mobility, dignity, and pain relief and yet there is very little evidence to help practitioners undertake these activities or measure their effect in a consistent way.

Given the gaps in our knowledge base, it is not surprising that our policy approach to recruitment and retention still has a way to go.

INTRODUCTION

Australia is currently facing the dual challenge of an ageing population and ageing healthcare workforce. The impact is one of increasing demand for healthcare and a corresponding difficulty in maintaining a workforce of sufficient size and quality to meet these demands. Health Workforce Australia (HWA) was established to ensure that by 2025 we have strategies and structures in place that provide Australia with a high quality and sustainable health workforce. (1-3)

The timing of this initiative provides a unique opportunity to consider the nature of nursing's and midwifery's contribution to quality healthcare. An evidence-based approach is called for to establish what we currently know impacts on nurses' and midwives' ability to provide high quality care. This project is a systematic and necessarily pragmatic review of the literature to synthesise the best evidence around the provision of quality nursing and midwifery care.

BACKGROUND

Australia, like most other countries is involved in significant health reform. One of the biggest areas of reform is around the healthcare workforce, both in terms of its size and its composition. HWA was established under the national partnership agreement on hospital and health workforce reform to support improved health workforce capacity through a national approach to workforce policy and planning across all health disciplines including expanding clinical training opportunities and supporting innovation in the health workforce. (1-3) Significant investment is being put into modelling current activity and creating scenarios to predict both the numbers and type of healthcare professionals (and support staff) required to deliver a quality health service to the population.

Similar initiatives to identify strategies for the healthcare workforce have been initiated worldwide. In 2005, the International Council of Nurses (ICN) undertook an overview of evidence and policy initiatives. They also identified the problem of the underutilisation of nurses within the workforce relevant to the nursing workforce on national models of health workforce planning and service planning.(4) The importance of appropriate and sustainable data for effective health human resource planning and the need for effective and ongoing interactions among stakeholders were addressed. The ICN recommended health and human resource planning be needs-based, outcome directed and with more consistent use of alternative forms of healthcare delivery such as the nurse practitioner role. However, emerging new roles may also lead to unintended shortages in other specialities or areas. Modelling of retirement and modification of work environment initiatives might facilitate the managing of an aging nursing workforce. Retaining older nurses in the workforce is necessary for effective mentorship.

A European initiative to investigate critical gaps in healthcare workforce describing its management in nine European countries was undertaken in 2006.(5) This report examined a number of implemented policies and addressed key areas in need of further interventions to ensure effective development in relation to the health workforce and the national health goals. Some countries identified a decrease in the number of nursing students and noted several opinions that nursing jobs were considered to be unattractive, which raised the arguments for further development of nurse education, facilitation of continuing education and development of fairer career structures. Other European countries demonstrated that professional development, such as access to higher degrees in nursing and the upgrading of

the education of nurses and midwives had impacted on their professional standing and the prestige of the profession in the society. The majority of the European countries surveyed addressed human resource planning and the imbalance in demand and supply as the main issues, where it is necessary to establish a comprehensive personnel planning and management system at all levels across the healthcare sector. Several countries requested a health personnel recruitment plan to be used at the Government level.

The green paper “On the European workforce for health” published by the European Union (EU) addressed the issues, on local as well as national health manager levels, relating to the EU health workforce and what actions that need to be taken on an EU level.(6) The paper concluded with a number of recommendations which in turn were sent out for open consultation to Member States and stakeholders (i.e. patients, consumers, trade unions and employers, national competency authorities, health professionals and healthcare managers).(7) Actions around working conditions and training were highlighted. More effective deployment of the health workforce, support for updating skills, EU legislation of working time and better occupational health were some of the suggestions referring to continuing professional development and extended and advanced roles for health workers were seen as important for the majority of the respondents. Nurses’ organisations stressed the importance of improved working conditions, actions towards the gender imbalance, access to high quality continuing professional development and an agreed definition of the roles of nurses and midwives. Academia’s responses focused on modernisation of education and training, where skills and competencies rather than qualifications need to be highlighted.

In 2010, a report about the future of nursing and midwifery in England was launched.(8) This report was based on evidence and opinions from a wide variety of stakeholders, individuals as well as organisations. A commission synthesised the material and seven key themes were identified: high quality, compassionate care; the political economy of nursing and midwifery; health and wellbeing; caring for people with long-term conditions; promoting innovation in nursing and midwifery; nurses and midwives leading services; and careers in nursing and midwifery. The commission’s recommendations (n=20) emphasised for example; senior nurses’ and midwives’ responsibility for care, their contribution to health and well-being, continuing professional development, flexible roles and career structures. The report identified the need for further investigation of how to integrate practice, education and research. Research gaps need to be identified and strategies to enhance research funding and research utilisation need to be developed. The commission also recommended the development of a national framework of nursing indicators to be used in measuring progress and outcomes.

The Institute of Medicine (IOM) has worked on a similar report which was launched at a time for great opportunity in the American health care system, which was facing new health laws and new demands on the health care system.(9) The IOM report has four key messages:

> *1) Nurses should practice to the full extent of their education and training, 2) Nurses should achieve higher levels of education and training through an improved education system that promotes seamless academic progression, 3) Nurses should be full partners, with physicians and other health professionals, in redesigning the health care in the United States, and 4) Effective workforce planning and policy making require better data collection and an improved information infrastructure* (Part 1, p13).

In 2012, the Canadian report *A nursing call to action. The health of our nation, the future of our health system* was published.(10) The plan for action covered nine areas for transformation: Top five in 5 years; Put individuals, families and communities first; Implement primary health care for all; Invest strategically to improve the factors that determine health; Pay attention to Canadians at risk of falling behind; Think health; Ensure safety and quality in care; Prepare the providers; and Use technology to its fullest. The report demonstrates the importance of the nurse’s work in each of the specified areas. They also concluded that

nurses can and should take action and the future work will be on focusing on the ways nursing can contribute and be used more effectively.(10)

These reports have all shown the impact the nursing and midwifery professions have on society and they strongly recommend nurses to take the opportunity and lead the development of the future nursing workforce. Hamilton and Campbell (2011) also highlighted the importance of nurses participating in reforming health care on their own terms. “Boardroom” knowledge (focusing on productivity) versus knowledge of direct care may lead to conflicting priorities.(11)

However, there seems to be a need for taking a further step to systematically explore the current evidence around nurse’s/midwife’s ability to provide high quality patient care and how they can contribute to improved patient outcomes, to shape the Australian nursing future workforce. This is not only in the interest of the national agenda, but also needed in light of the results of the current international literature focusing on the future of nursing.

As part of the ongoing discussion around this important agenda, a group of nurse leaders have come together to begin to map out what a high quality nursing workforce and the context within which it would work would look like over the next two decades. Three meetings have been held, co-hosted by Professor Jill White, Dean of Nursing, University of Sydney and Professor Iain Graham, Dean of Health, Head of School, School of Health and Human Sciences, Southern Cross University (Appendix I: Expert Reference Group). The primary purpose of the events has been to create a discussion document that can engage the professions of nursing and midwifery about the future and also inform HWA’s important work by providing an informed and professionally supported view of the possible future scenarios facing the nursing and midwifery workforce.

A first vital step was the undertaking of an umbrella review of the literature that summarises the Australian and international evidence around factors that are known to impact upon the ability of nurses and midwives to deliver high quality patient care. There are factors that enable and promote effective nursing care and there are those that militate against the delivery of effective nursing care. This review has been undertaken in order to better understand the evidence-base that will inform the future development of Australia’s nursing workforce.

The question of what impacts on nurse’s ability to provide quality care is quite obviously very broad. An important part of the planning of any systematic review is to establish the focus and scope of the review. Too narrow a focus and the results may be too limited to meet the stated aims of the review. Too broad a focus and the project becomes impractical with the time and resources available to conduct the review. A rapid search of the current review repositories (the Cochrane Collaboration, Campbell Collaboration, Joanna Briggs Institute (JBI), Centre for Reviews and Dissemination (CRD)) identified at least 58 potentially relevant systematic reviews that could inform the purpose and scope of the nursing futures work. The number of systematic reviews available is testament to the expansive body of research that would potentially inform this issue. The nature of the research also needed to be considered. The reviews initially included orthodox reviews of effect, systematic reviews of qualitative research and comprehensive reviews that synthesised both quantitative and qualitative evidence. In light of the scoping search it was decided to consider evidence of both a quantitative and qualitative nature but pragmatically restrict the level of evidence to existing systematic reviews. We therefore undertook an umbrella review of existing systematic reviews.

The scoping search also provided an overview of the content of the evidence that impacts on the quality of nursing care. As a result, this review considered existing evidence from four main areas including: the context in which nursing/midwifery care is provided; the organisation of care delivery; the education and ongoing preparation of nurses/midwives for practice; and nurse/midwife-patient relationship.

Review questions

1. What factors related to the *context of care* influence the nurse's and midwife's ability to provide quality patient-centred care?
2. What factors related to the *way nursing and midwifery is organised* influence the nurse's and midwife's ability to provide quality patient-centred care?
3. What factors related to *educational preparation* influence the nurse's and midwife's ability to provide quality patient-centred care?
4. What factors related to the *career opportunities and continuing professional development* (CPD) opportunities influence the nurse's and midwife's ability to provide quality patient-centred care?
5. What factors related to the way nurses, midwives and patients *interact in the direct care encounter* influence the nurse's and midwife's ability to provide quality patient-centred care?

METHOD

Systematic reviews differ in terms of the type of evidence to be included, examined and the overall scope of the review. What defines a systematic review is the common process of; an exhaustive search of the available evidence, critical appraisal and data extraction of the evidence and an appropriate method of synthesis. The objective for this review was very broad and following the scoping search for this project it became apparent that there were a large number of existing systematic reviews to inform the review questions. For this reason it was decided that an overview of systematic reviews, otherwise known as an 'umbrella review' would be undertaken.(12-14)

The conduct of a systematic review should ensure that the results are relevant to the practice area being investigated while maintaining methodological integrity. In most cases the authors of the originally sourced systematic reviews specified recommendations for practice and research. The focus of this review was informed by a reference group of nursing leaders (Appendix I: Expert Reference Group). This group has also reviewed the results from the review and provided advice about which recommendations were most relevant to the current context. The reference group also provided guidance with regard implications for policy and education.

STUDY CHARACTERISTICS

Types of reviews

The umbrella review considered any existing systematic reviews of quantitative and qualitative evidence. Quantitative systematic reviews that synthesised the following research designs: randomised control trials (RCTs), quasi RCTs and observational studies were considered for inclusion. Reviews of qualitative studies (ethnographic, phenomenological and interpretative) were also considered for inclusion. Comprehensive systematic reviews that examined both research approaches were also considered for inclusion. It was not deemed feasible or necessary to include additional primary studies in this review.

Types of participants

This umbrella review considered publications that included registered nurses (RNs) and midwives working in any healthcare setting from any ethnic background. The review excluded unqualified carers, family carers or other types of staff that support nursing care.

Types of interventions/phenomena of interest

Interventions/phenomena of interest included but were not limited to:

The context of care

- The organisational philosophy around clinical care, quality and safety
- Organisational practices/approaches to nursing staffing, skill mix, and nurse patient ratios
- Executive nursing/midwifery roles within organisations
- Levels of nursing /midwifery autonomy and accountability
- Relationships between medical and nursing/midwifery (and other) staff

- Feedback systems
- Resources and financial status
- Organisational culture

The organisation of nursing

- Nurse's/midwife's participation in clinical decision making and the organisation of care at local level
- Integrated nursing/midwifery teams versus task allocation
- Clinical leadership capacity
- Mentoring and clinical supervision at local level
- Staffing and skill mix
- Feedback on performance

The educational preparation and career opportunities for nurses/midwives

- The impact of graduate entry education
- Opportunities and support for nurse's/midwife's continuing professional development
- Introduction and support of new roles

The nurse/midwife-patient relationship

- Patient-centred care
- Therapeutic nurse/midwife-patient relationship

Types of outcome measures

The primary outcome measures of interest were measures of the quality of patient care. These included those related to nursing/midwifery characteristics (education, competence, scope of practice); nursing/midwifery staffing characteristics (ratios, skill mix); organisational characteristics (culture, resources, relationships, communication, governance); nurse/midwife-patient relationship characteristics (patient-centred care practices); nurse/midwife outcomes (satisfaction) and patient outcomes (failure to rescue, recovery rates, morbidity and mortality, satisfaction). It should be noted that many of these outcome measures are also factors that create further impact on the environment in which care is provided.

Exclusion criteria

Systematic reviews covering specific technical interventions, for example pressure relieving devices, were excluded. Although it can be argued practice or technical interventions do impact on quality of care it is simply not feasible to synthesise this entire body of systematic reviews.

Search strategy

This work started in 2011 where a scoping search of relevant databases (the Cochrane Collaboration, Campbell Collaboration, JBI, CRD) was undertaken, followed by an analysis of the text words in the titles and abstracts and the index of terms used to describe the reviews. The following initial keywords were identified for use in the scoping search for existing reviews: 'systematic review', 'registered nurse', patient outcome', 'skill mix', 'ratios', 'failure to rescue', 'staff satisfaction', 'retention rates', 'organisational culture', 'burnout', 'job dissatisfaction', 'teamwork', 'nurse-doctor relationships', 'nursing workload', 'graduate entry nurses', 'nursing competency level', 'scope of practice', 'educational preparation and burnout', 'patient-centred care', 'magnet hospitals', 'safety and quality and nursing workforce'. After retrieving a number of reviews from the scoping search these additional keywords were added: 'midwife', 'nurse-patient relationship', 'patient-centred care', 'professional development', 'career opportunities', 'education', 'context', 'context of care'.

In June 2012, a comprehensive search using all identified key words from the reviews and index terms was then undertaken across all included databases (Campbell Collaboration, JBI, CRD, PubMed Central, Cumulative Index to Nursing and Allied Health (CINAHL), Embase, Cochrane Database of Systematic Reviews, Scopus, JBI Register and Google Scholar) to update the list of the included reviews.

All keywords were linked to the main terms 'registered nurse' and 'midwife'. In addition, all reference lists of retrieved reviews were checked for further reviews. The search strategy focused on reviews reported in the English language. There was no restriction on publication dates.

Assessment of methodological quality

The umbrella review was undertaken using review processes based on the JBI System for the Unified Management, Assessment and Review of Information (JBI-SUMARI). (15)

Systematic reviews that met the inclusion criteria were assessed by two independent reviewers for methodological validity prior to inclusion using a standardised JBI critical appraisal tool for systematic reviews (Appendix II: Critical appraisal tool). Any disagreements that arose were resolved through discussion, or with a third reviewer experienced in the topic and the review processes. All five reviewers (the authors) undertook the critical appraisal.

Data collection/extraction

Data was extracted from reviews using a standardised data extraction tool (Appendix III: Data extraction tool). As no existing data extraction tool was deemed suitable a data extraction tool was developed specifically for this umbrella review. The reviewers used JBI's standardised data extraction tool for Experimental/Observational Studies, Interpretive and Critical Research and Texts as guidelines for the development of the tool.(15) The data extracted included specific details about the interventions/phenomena, populations, settings, review methods and outcomes of significance to the review question and specific objectives.

A total of five reviewers extracted the data independently. The reviewers extracted data from papers where they had not been involved in the critical appraisal process to further refine the critical appraisal procedure. All reviewers met and discussed extracted data and final decision of inclusion of reviews was made. One of the reviewers was a co-author of one the reviews, which was therefore reviewed by another independent reviewer.

Data synthesis

The evidence that informs this review comprises the results/findings of quantitative, qualitative and mixed evidence systematic reviews. No attempt was made to conduct a meta-analysis. For the reviews reporting quantitative data only this was not appropriate due to heterogeneity. For qualitative reviews a formal meta-synthesis would also have been impractical. Therefore a narrative synthesis was deemed the most appropriate method of summarising and reporting the results. The main themes evolved from the review questions and findings from the systematic reviews were synthesised and categorised into subthemes on the basis of similarity in meaning.

All results were integrated and a narrative synthesis summarised the existing evidence from the four main themes of context, organisation of nursing/midwifery, education, and nurse/midwife-patient relationship. The report concludes with implications and recommendations for education, practice, policy and further research.

RESULTS

The results from this umbrella review will be presented in relation to the four main themes and their subthemes, see Figure 1 below.

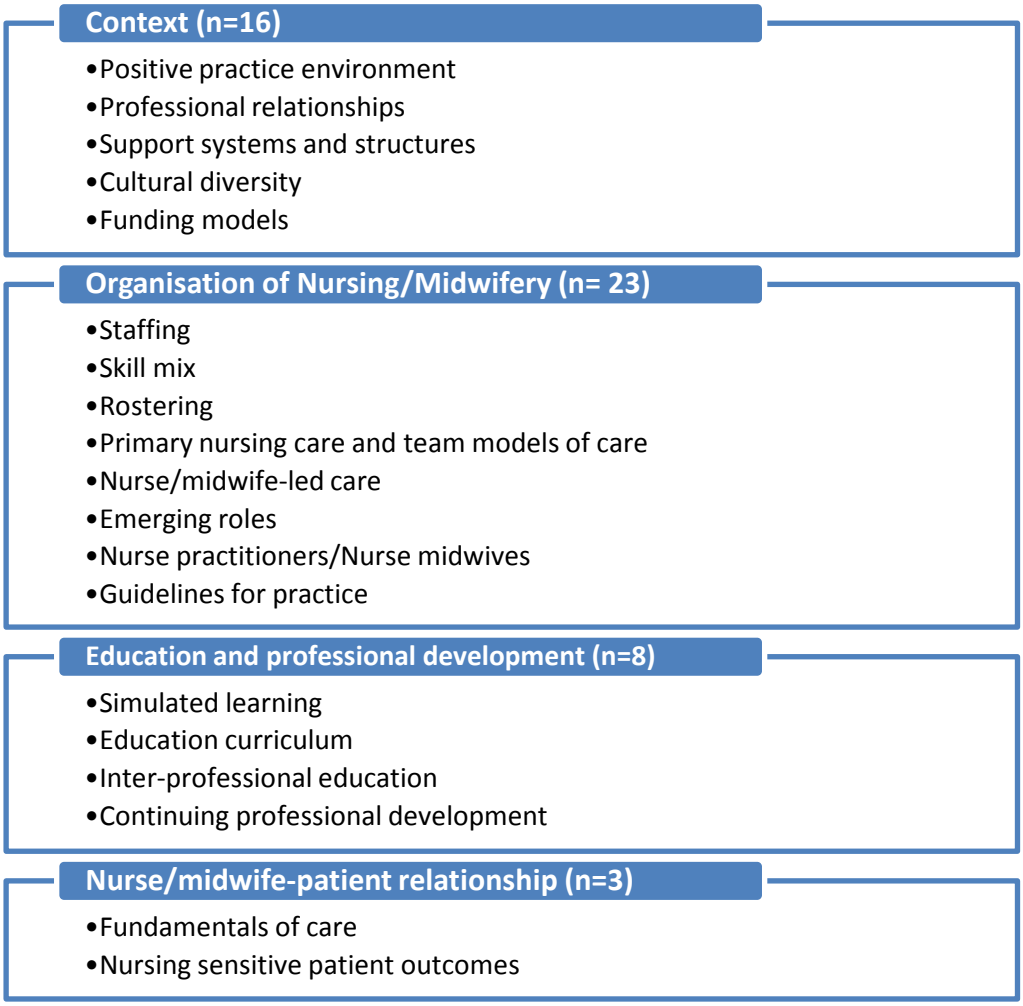

Figure 1 Summary of subthemes and number (n=) of systematic reviews within each theme

Results of the search

The search of the databases identified 2846 articles as potential systematic reviews relevant to our umbrella review. After consideration of title and abstract 521 potential systematic reviews were retrieved (425 from database search and 96 from grey literature and reference lists). Of these 79 were subjected to critical appraisal once the full text was considered against the inclusion criteria. The inclusion/exclusion process is further described in Figure 2. A total of 50 systematic reviews have been included in the final report (Appendix IV: Included systematic reviews).

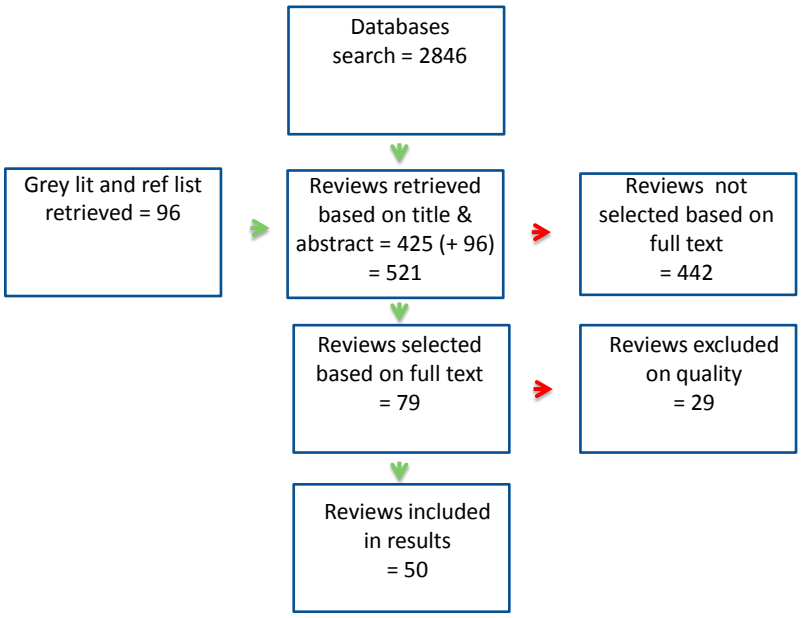

Figure 2 The description of the inclusion/ exclusion process

Included reviews

The included systematic reviews (n=50) were published between 1995 and 2012. A wide range of study settings were covered. The primary studies included in the systematic reviews were mainly from USA, Australia and UK. Australia was represented in 20 out of 50 systematic reviews (40%), however detailed information about the primary studies' country was not stated in 14 of the included systematic reviews. In addition, studies from Europe, Asia, South America and New Zealand were represented.

The specific settings for the studies were mainly hospitals, learning settings, nursing homes, general practices, home care and community. The population consisted of RNs, midwives, advanced nursing roles, multi-professional teams, and patients. Many clinical specialties were described; however, most of the studies were from the following areas: acute care, intensive care, paediatrics, palliative care, oncology, mental health, midwifery, primary care, community nursing and aged care.

Out of these 50 systematic reviews, seven systematic reviews had midwives included in the population, but the population was not specified in all of the included systematic reviews. However, only systematic reviews where nursing/midwifery specific data were available were included.

Excluded reviews

A number of reviews were excluded (total n=29), based on quality criteria mainly because of poor or limited description of methodology and more specifically because of their lack of critical appraisal or vague descriptions of the critical appraisal procedure (Appendix V: Excluded systematic reviews).

MAIN RESULTS

The results of the umbrella review are presented as they relate to the review questions. Questions 3 and 4 were combined (see Figure 1) due to the small number of systematic reviews identified and the link between nurse education and continuing professional development. The structure of each sub section of results conforms to a similar pattern; first a summary of the main findings followed by descriptions of results as identified by emerging subthemes within the main theme and a synthesis of the findings.

RESULTS RELATING TO CONTEXT

When synthesising the results of this component of the review it was noted that a number of authors used terms to describe the context in which nurses provide care that impacted positively on both those providing care and those who received care. Salmond et al. (citing Hoffart and Woods,1996, Lake 2002) used the term Professional Nursing Practice Environment to describe this context indicating that if the environment was positive that this would lead to better nursing outcomes.(16) Similarly others have used the term Healthy Working Environments.(17-20) A series of systematic reviews was conducted as part of a larger guideline development project by the registered nurses association of Ontario to determine what aspects of professional nursing practice can develop and sustain a healthy work environment that would benefit both nurses and patients.(17-20) More recently a number of peak bodies including ICN and World Health Organization (WHO) have used the term Positive Practice Environments to describe settings where conditions support excellence in healthcare.(21, 22) This term will be used for the context in which healthcare is ideally provided.

Number of included reviews and studies

For this component of the review 16 systematic reviews were included which considered a total of 408 papers.

Organisation of results

All of the included reviews that examined the context in which care is provided addressed issues that would lead to or impact on what could be termed a Positive Practice Environment. Issues relating to a positive practice environment in the literature can also be identified within the following subthemes. The first is Professional Relationships which includes findings around working in teams, leadership, autonomy of practice and Inter-Professional Practice. The next subtheme is Support Systems and Structures which includes evidence-based practice support and structures, documentation systems, Clinical Decision Support Systems and Workload and Staff Shortages. Another subtheme is Cultural Diversity and the final subtheme is Funding Models. These subthemes were derived from the thematic analysis of the reviews and each one will be presented in terms of its meaning and evidence base.

Positive Practice Environment

One systematic review by Salmond et al. (2009) addressed the overall complexity of organisational level change to improve the practice environment.(16) The review considered the impact of Magnet designation on patient and nurse outcomes. Magnet is certification program where hospitals demonstrate compliance with a number of quality criteria that would result in increased recruitment and retention of nurses. They also aimed to determine if the economic investment of the Magnet program supported these outcomes. The review included 17 studies. Their findings were that Magnet designation had a positive impact on the practice environment and was associated with lower levels of emotional exhaustion, increased job satisfaction and a higher intention to stay for nursing staff. The findings with regard to patient outcomes were less positive with only one study finding a link between Magnet designation and reduced prevalence of pressure ulcers. Another study found no link between Magnet designation and patient outcomes. No studies were included in the review that evaluated cost effectiveness.

Synthesis

There is clear evidence that programs such as Magnet can help to create a positive practice environment and that in turn this has a positive impact on nurses working within these organisations including reduced levels of emotional exhaustion and increases in satisfaction and rates of intention to stay. The evidence is much less clear about the impact on patient outcomes but this is due to the level and rigour of the studies that have been conducted rather than good evidence of equivocal results. The Salmond et al. (2009) review examined the effect of one comprehensive program to improve the practice environment however; their conclusions and subsequent recommendations were more broadly focussed than just in regard to Magnet programs.(16)

Professional Relationships

A number of systematic reviews explored specific aspects of the positive practice environment that result from the manner in which nurses and other health professionals work together. These aspects included; working in teams, leadership, autonomy of practice and inter-professional practice.

Working in teams

Two reviews investigated issues around working in teams.(19, 23) Pearson et al. (2006) explored team work processes, the characteristics and structures of nursing teams and their impact on a healthy working environment.(19) In examining the impact of team nursing the authors considered the findings were inconclusive. There were only two studies that were included in the review and they only measured satisfaction levels of patients. One study indicated there was some improvement in satisfaction with team nursing in an obstetric environment while the other study found no difference in satisfaction levels comparing team nursing and a patient allocation model. The findings of the review also summarised characteristics of teams that were deemed as having a positive impact on a healthy working environment. Studies indicated that working within teams resulted in an increase in accountability, commitment in a team produces greater cohesiveness and enthusiasm and motivation increased the effectiveness of a team. Social support within a team increased staff satisfaction levels and reducing conflict within a team could improve satisfaction levels, team performance and retention rates. Communication within a team was a characteristic that led to improvements in quality of care and length of stay. The other review by Timmermans et al. (2012) examined processes of team learning and the impact on implementing new innovations. The authors concluded that empirical research on team learning was scarce and of low quality and as a result made no recommendations for practice.(23)

Synthesis

A number of questions arise in relation to working in teams in a positive practice environment. What is the effectiveness of providing nursing care using a team based approach? When working within teams what are the characteristics of an effective team? What strategies can be used to improve team performance? The available evidence was found to be inconclusive although good communication was seen as being of key importance. Teams that worked best demonstrated accountability, enthusiasm, commitment, motivation and social support. Team functioning was also felt to be improved by involving staff in important decision making such as with unit policies.

Leadership

Two systematic reviews were identified that examined the impact of leadership on the context in which care is provided. Pearson et al. (2007) reviewed research (44 papers) that examined leadership styles and attributes that impacted positively on patients, staff and organisations.(17) They determined that no one leadership style or attribute could be said to definitively result in positive changes to the work environment. They did find evidence that certain leadership styles have a positive impact on specific outcomes but the findings were quite variable.

With regard to nursing staff: social and transformational leadership approaches were found to be positively associated with job satisfaction, whilst participatory leadership style was associated with lower staff turnover. Regarding patients; transformational, transactional, consultative and participatory leadership styles were associated with quality of life measures. Fewer health complaints by patients were associated with a social leadership style as well as an instrumental leadership style.(17)

Transformational and transactional leadership styles were also found to be positively associated with patient satisfaction. In terms of the impact of leadership on organisations a transformational leadership style was associated with: unit effectiveness, increased effort from staff and a positive organisational culture. The review also found that certain specific characteristics, rather than leadership style per se were associated with improved outcomes and positive changes to the working environment and these were; flexibility, trust, respect, support, consideration and motivation. Finally effective communication was considered a recurrent theme in many papers in creating a positive practice environment. The authors caution that the evidence identified was limited in terms of quality.(17)

Another systematic review by Wong and Cummings (2007) also specifically addressed the impact of nursing leadership on patient outcomes.(24) Outcome measures from the included studies were patient satisfaction, mortality and measures of patient safety, adverse events and complications. Wong and Cummings (2007) concurred with Pearson et al. (2007) in that they also found evidence of an association between positive leadership attributes and increased patient satisfaction.(17, 24) However, they also identified evidence that indicated the positive effects of transactional leadership style on patient satisfaction decreased with a wider span of control (total number of staff reporting) of the manager. Three studies from the review measured the association between leadership and patient mortality but only one had a statistically significant positive association and the reviewers felt this required further explanation.(24)

Synthesis

The evidence indicates it is clear that leadership does impact on the environment in which care is provided. The impact on nurses can be felt with regard to job satisfaction and staff turnover. The impact on organisations relates to unit effectiveness, staff effort and the overall organisational structure. Positive leadership was also found to increase patient satisfaction. These outcomes however were often attributed to a specific style of leadership or leadership attribute. Transformational leadership in particular had positive impacts on patients and staff

but other styles and attributes also had a significant impact. The evidence however was limited in quality despite there being a reasonably large number of studies.

Autonomy of Practice

Two reviews examined directly or indirectly issues around autonomy of practice for nurses and the impact on quality of care.(25, 26) Working in a multi-disciplinary environment will always bring with it the potential for a power imbalance and risk of nurses not being free to contribute to decisions that they believe are the right decisions for their patients. As a result the effect on nurses can be degrees of moral and or ethical distress with corresponding negative impacts on the working environment and patient outcomes.

Kazanjian et al. (2005) specifically examined studies that measured the association between nursing autonomy and patient mortality. Although two studies in the review found no association, three studies did find an association between nursing autonomy and lower patient mortality.(25) Rittenmeyer and Huffman (2009) identified many studies that found moral/ethical distress arising when nurses were unable to advocate for patients due to organisational or inter-professional constraints. This occurred when they perceived that patients were suffering from treatments provided by others, particularly when they felt the patients' wishes were being ignored by physicians, the organisation and families. Distress was also apparent when there were conflicting professional goals or nurses were undervalued by others in assisting in setting treatment goals. Further, they found that as a result of moral distress many nurses left employment or even the profession. As a result poorer staffing levels then contributed to further moral distress.(26)

Synthesis

The types of research addressing autonomy of practice in nursing is varied and the level and quality of studies is variable but the evidence indicates that autonomy of practice does impact on nurses directly, in particular around degrees of moral/ethical distress. There is some evidence to suggest that ultimately this impacts on patient outcomes with studies having identified an impact on patient mortality.

Inter-Professional Practice

It is inescapable that nursing practice is conducted most often in a multi-disciplinary environment. The manner in which disciplinary groups work together will naturally have an effect on the environment in which clinicians work. Poor relations between disciplines can result in moral distress and potentially impact negatively on patient outcomes. Various inter-professional strategies have been evaluated. Kazanjian et al. (2009) identified 10 studies that examined inter-professional relations and the impact on patient mortality, mainly in intensive care units.(25) One study specifically evaluated the effectiveness of inter-professional rounds. This study was underpowered and unable to detect an effect on mortality. Other studies did find an association between mortality and positive inter-professional relationships but did not indicate what strategies should be pursued to achieve this. Zwarenstein et al. (2009) identified a small number of studies that evaluated inter-professional rounds, inter-professional meetings and external inter-professional audits. Although they did find positive outcomes in relation to these interventions they cautioned that the number and size of the studies were small and as a result they made no firm recommendations for practice.(27)

Synthesis

Good inter-professional relations improve the quality of patient care and also positively impact on the practice environment. There has been some evaluation of strategies to improve inter-professional relations. Although the results are generally positive the body of research is small in terms of the number and size of studies making recommendations about specific strategies difficult.

Support Systems and Structures

Elements within this subtheme include reviews of studies evaluating the effectiveness of evidence based practice support systems, documentation systems, decision support systems, workload and staffing shortages on nursing practice and patient care

Evidence based Practice (EBP) support and structures

Two systematic reviews reported on mechanisms that organisations could use to provide evidence based care. The two reviews utilised very different approaches. Flodgren et al. (2012) looked specifically at studies evaluating the effectiveness of organisational infrastructure to promote evidence-based nursing practice.(28) They defined organisational infrastructure as 'being "the underlying foundation or basic framework through which clinical care is delivered and supported", which includes for example: organisational policies, nurse development units and other types of organisational developments such as developing and implementing evidence-based nursing procedures, standards or guidelines for clinical practice'.(28) They included in their results only one study despite the willingness to accept studies down to the level of controlled before and after studies. The study assessed the introduction of an 'evidence-based' procedure to prevent pressure ulcers but was not able to achieve a statistically significant result.

Medves et al. (2009) took a broader approach examining the evidence of dissemination and implementation strategies for clinical guidelines.(29) They included a large number (88) of studies with a variety of strategies. The ten strategies included in the results were; distribution of education materials, education meetings, local consensus processes, education outreach visits, local opinion leaders, patient mediated input, audit and feedback, reminders, marketing and mass media. For each strategy the majority of studies reported statistically significant positive results. Medves et al. (2009) make the point that for each intervention the results cannot be attributed to the specific intervention alone.(29) The studies also had considerable variation in the outcomes. Most commonly a change in knowledge was seen but a change in practice was demonstrated in only a few studies and without statistical significance. Six out of twelve studies did report significant findings with regard to economic outcomes.(29)

Synthesis

In considering the evidence for strategies to disseminate and implement clinical guidelines it is common to see the conclusion that the effect cannot be attributed to a specific intervention. The difficulty is that these strategies are used mostly in combination and therefore it is not useful to consider effectiveness in terms of single interventions. Medves et al. (2009) make the point that a multi-focussed approach should be taken and has the best potential for improvements in knowledge, practice and patient outcomes.(29)

Documentation systems

Much of a clinician's day, particularly for nurses, is spent in documenting practice. Two systematic reviews examined the evidence with regard to documentation systems.(30, 31) Poissant et al. (2005) examined electronic health records and their potential to reduce documentation time.(30) For nurses (but not doctors) there was reduction in overall documentation time for a shift. The authors make the point that the flow on impact of this time saving on other outcomes has not been explored. Urquhart et al. (2009) took a broader approach and examined nursing documentation systems both electronic and otherwise.(31) They found that components of recording systems for discrete care problems such as pain management were effective for a variety of other care issues. When looking at systems there is no evidence that one has an advantage over the other, but structured records are better

than unstructured. In contrast, Poissant et al. (2005) they found computer based records took more time without necessarily improving patient outcomes.(30, 31)

Synthesis

Electronic systems reduce time spent in documentation for nurses but not for physicians. However, there is a lack of evidence of their efficacy particularly in terms of patient outcomes, which is a concern. Urqhuart et al. (2009) highlight that the problem with nursing documentation is not so much about the mechanism of documentation but what is being documented and for what purposes. They consider that many documentation systems are designed without input from the nurses who will use the system. They suggest that if documentation systems are going to improve nursing practice then more emphasis needs to placed on those who will use the system.(31). More structured, focused electronic systems tend to work better than broad ones.

Clinical decision support systems

One systematic review by Randell et al. (2007) examined the evidence on computerised decision support systems in relation to nursing performance and patient outcomes.(32) They found that the results from the studies were very inconsistent and the study designs had significant methodological problems, particularly contamination. They also indicated it was difficult to synthesise the results of the studies because of the variability in what the systems were designed to do and the context in which they would be used.(32)

Synthesis

Considering the significant amount of resources being expended on computer decision support systems the lack of robust research is of concern.

Workload and Staff Shortages

The impact of workload and staffing on patient outcomes has been addressed elsewhere in this review (See Organisation of Nursing Results section). Included under context was the review by Gi et al. as the area of interest was the impact of context on nursing shortages. Gi et al. (2011) conducted a review to examine the relationship between nursing shortages and the impact on nurses working within the settings where shortages occurred and resulting there was a corresponding increase in workload.(33) The review identified a small number of papers with studies focussed on the oncology units. They found evidence of a cyclical problem where staff shortages impacted on the positive practice environment causing job dissatisfaction, stress and burnout and resulting in more nurses deciding to leave. They also found that nurses' perceptions of staff shortages were dependent on demographics and organisational characteristics and the specific setting within the organisation.(33)

Synthesis

The results of the Gi et al. (2011) review underscore the complex nature of the context in which nursing care is provided. Not only does the positive practice environment impact on the quality of care nurses provide but the state of the environment can perpetuate further negative changes to the environment. Staffing levels in particular are both a characteristic of the environment and mechanism to influence staff to leave resulting in a further degradation of the positive practice environment.(33)

Cultural Diversity

This subtheme under the context theme addressed the nurse's sensitivity to cultural diversity both in terms of patient care and how the organization supported a culturally diverse workforce. We found no systematic reviews exploring Aboriginal and Torres Strait Islander peoples' experiences or the experiences of nurses from indigenous backgrounds in nursing.

Pearson et al. (2007) examined the evidence on whether embracing cultural diversity had a positive impact on the working environment for nurses.(20, 34) Specifically they examined the organisational structures and processes that support culturally competent practices. They identified that organisations need to work collaboratively to improve services for culturally diverse groups. To improve cultural competence, organisations need to embed both education and training as well as appropriate processes and practices within organisational structures. Healthcare providers need a particular skill set to deliver culturally competent care and this can be assisted by recruiting staff from diverse backgrounds.

Synthesis

Although there is evidence that will assist organisations to deliver culturally competent care the impact on nurses patients and the positive practice environment has not been explored with any robust research. Considering the increasingly multi-cultural nature of the healthcare environment this is a dominant issue.

Funding Models

The final issue in relation to context that may impact on the quality of nursing care provided is that of care provided is that of differing funding models. The only evidence found related to care provided using a not-for-profit funding model in comparison to a for-profit funding model. The review by Comondore et al. (2009) examined this issue but only in terms of residential aged care.(35) It should also be noted that there was only one Australian study and most others were conducted in the USA. They conducted a meta-analysis (10 studies) with the outcome of quality level of nursing staff which resulted in the not-for-profit group having a statistically significant higher rank of quality staff. They also conducted a meta-analysis (11 studies) examining the incidence of pressure ulcers and this also favoured the not-for-profit group significantly. Other measures of quality favoured the not for profit group but were not significant.(35)

Synthesis

The question of whether the funding of an organisation providing health care makes a difference in terms of quality is complex. The evidence suggests a trend that would indicate higher quality care in not-for-profit aged care facilities but the evidence is not sufficiently robust to determine specifically the mechanisms that may result in measurable differences in care. This needs further exploration.

RESULTS RELATING TO ORGANISATION OF NURSING/MIDWIFERY

The findings for this section of the review have been themed around staffing and skill mix, models of care, advanced and practitioner roles and use of clinical guidelines

Number of included reviews and studies

For this component of the review 23 systematic reviews were included which considered a total of 462 papers.

Organisation of results

Systematic reviews focusing on issues around resources and roles impacting the way the nursing/midwifery care is delivered is termed as Organisation of Nursing/Midwifery. The literature revealed a number of subthemes: Staffing, Skill mix, Rostering, Primary nursing care and team models of care, Nurse/Midwife-led care, Emerging roles and Nurse Practitioners/Nurse Midwives, and Guidelines for practice.

Staffing

There were four reviews relating to staffing levels, all indicating that increased RN staffing levels were associated with a range of improved patient outcomes.

The Kane et al. (2007) review found greater RN staffing was consistently associated with a reduction in the adjusted odds ratio of hospital related mortality. An increase by 1 RN full time equivalent (FTE) per patient day was associated with a 9% reduction in odds of death in intensive care units, 16% in surgical and 6% in medical patients. Higher RN staffing was also associated with lower odds of several patient adverse events. Pooled analysis detected a significant and consistent reduction in odds of hospital-acquired pneumonia of 19% in all patients and 30% in intensive care units. An increase by 1 RN FTE per patient day was associated with 60% lower odds of respiratory failure; unplanned extubations were 51% less; and odds of cardiac arrest were 28% less in intensive care units. In surgical patients, odds of failure to rescue and of nosocomial bloodstream infection were reduced by 16% and 36%, respectively. RN staffing was not associated with urinary tract infections and surgical bleeding. But the arguments for a causal relationship are mixed.(36)

Lankshear et al. (2005) strongly suggested that higher nurse staffing and richer skill mix (especially of RNs) are associated with improved patient outcomes, although the effect size cannot be estimated reliably.(37) An increase in RN staffing levels was associated with reduced rates of pneumonia, urinary tract infections, decubitus ulcers, and mortality. Interestingly, the size of the effect decreased the greater the base level of staffing. Hospitals with higher RN and LPN (licensed practical nurse) staffing had lower incidences of atelectasis, decubitus ulcers, falls, and urinary tract infections. In the acute area, there is significant inverse relationship between RN staffing levels and mortality rates. There are also negative associations between nurse staffing and failure to rescue. A positive association was described between RN or LPN hours or RN proportion and pneumonia and there is a link between nurse staffing and urinary tract infections, decubitus ulcers, falls, and wound infections. In acute settings, total staffing and LPN staffing tend not to demonstrate a link with improved outcomes. (37)

Pearson et al. (2006) identified strong correlations between patient characteristics and work environment, as well as between workload, staffing and quality of outcomes. A higher proportion of nurses is associated with increased patient satisfaction with nursing care and patient adverse events. The findings also showed that an increase in the number of RN hours was associated with improved patient outcomes.(18)

The review by Wilson et al. (2011) found increased RN nursing hours per patient day was associated with a decrease in eight adverse events.(38) These included mortality; failure to rescue; medication administration error; post op cardiopulmonary complications; pressure ulcers; fluid overload; unplanned extubation; peripheral intravenous infiltrates; parent/family complaint; patient length of stay. There also appears to be a level where increasing RN hours no longer has significant effect on decreasing adverse effects.(38)

Synthesis

There is a statistically and clinically significant association between RN staffing and patient outcomes.

In summary, increased RN staffing is associated with improved mortality, and many patient outcomes including: decreased mortality; reduction in decubitus ulcers, hospital acquired pneumonia, urinary tract infection, unplanned extubation (in intensive care unit only), cardiac arrest, failure to rescue, bloodstream infection, falls, central venous catheter infections, and wound infections among others. However the effect size is difficult to ascertain therefore the prescribed number of RNs required on each shift cannot be specified.

Skill mix

There were three reviews relating to the skill mix or ratio of RNs to other less qualified staff. Results were mixed with improved outcomes for length of stay and pressure ulcers but no differences in death rates. Also there is no data indicating an ideal ratio of RNs to other staff.

Butler et al. (2011) found the evidence in relation to the impact of replacing RNs with unqualified nursing assistants on patient outcomes is very limited.(39) This review suggested that specialist support staff (dietary assistants) may have an impact on patient outcomes. The review found no evidence that the addition of specialist nurses to nursing staff reduces patient death rates, attendance at the emergency department, or readmission rates, but suggests it is likely to result in shorter patient hospital stays and reductions in pressure ulcers.(39)

Lankshear et al. (2005), in their review strongly suggest that higher nurse staffing and richer skill mix (especially of RNs) are associated with improved patient outcomes, although they acknowledge the effect size cannot be estimated reliably.(37)

A higher RN skill mix contributed positively to three clinical outcomes in children as reported by Wilson et al. (2011). However this review also found results reporting an association between children's outcomes and casual/agency staff are equivocal.(38)

Synthesis

An increased ratio of RNs to other, less qualified staff is associated with improved patient outcomes including shorter hospital stays and reduction in pressure ulcers.

Rostering

Shift duration, self scheduling and compressed schedules were discussed in two reviews. These indicated a range of findings including positive and negative associations with longer shifts.

In their review of staffing models and staff and patient outcomes, Butler et al (2011) found self-scheduling may reduce staff turnover.(39)

Estabrooks et al. (2009) reviewed the effect of shift length on patient and healthcare provider outcomes.(40) They found the relationship between shift length (8- versus 12-hour) and quality of patient care was unclear and no significant differences in levels of job satisfaction among nurses working 8-hour compared with 12-hour shifts or before and after the implementation of a 12-hour shift system. Similar levels of stress were found between 12- and 8-hour shifts in some studies in this review, but others found those on 12-hour shifts had less stress and less emotional exhaustion.(40)

There was a significant relationship between shift length and the numbers of nursing errors, with more errors occurring on longer (12-hour +) shifts. The likelihood of making an error was two or three times higher when nurses worked shifts 12.5 hours or greater. Working a 12-hour day when combined with working a 40-hour week was significantly associated with a higher number of musculoskeletal complaints (but neither on its own was associated with this). Also working night shifts longer than 8-hour also had the greatest risk for alcohol and tobacco use.(40)

Nurses who worked a compressed schedule (i.e. work 12 hours/day x7 days, then off x7 days) reported significantly higher levels of overall wellbeing than nurses who worked other shift schedules. Nurses working a compressed 12 hour shift system had significantly lower levels of fatigue 2 months after the implementation of the shift system but 13 months after the implementation the levels were comparable with baseline.(40)

Synthesis

Shifts of longer than 12 hours are associated with increased nursing errors. The quality of patient care, stress and job satisfaction does not appear to be related to shift length.

Primary Nursing Care and Team Models of Care

Models of care relate to the way in which nursing care is delivered. This may include primary nursing and team nursing and midwifery. In Butler et al (2011) (citing Kozier 2008, p133), primary nursing is defined as “one nurse (the primary nurse) is responsible for total care of a number of patients 24 hours a day, seven days a week, aimed at providing comprehensive, individualised and consistent care”. The definition of team midwifery is described in Butler et al (2011) (citing Biro 2000) as: “a new model of maternity care characterised by continuity of midwifery care from early pregnancy to the postnatal period”. Three reviews discussed this topic.

In a review of the effectiveness of staffing models on patient and staff outcomes, Hodgkinson et al. (2011) found that there was no difference on most measures for primary nursing care versus team nursing. Where there was a difference, the primary nursing care model was better for patients and staff. There was no significant difference on staff morale measures.(41) When examining resident-oriented care versus usual care, this did not significantly improve resident/family satisfaction with care, resident well being or assessment of resident wellbeing. Co-ordination of care significantly increased on most wards.

In their review of staffing models and staff and patient outcomes, Butler et al. (2011) found primary nursing may reduce staff turnover. Also the introduction of team midwifery (versus standard care) may reduce medical procedures in labour and result in a shorter length of stay without compromising maternal and perinatal safety.(39)

Waldenström and Turnbull (1998), in their review comparing team midwifery care with standard maternity services, found team midwifery used less obstetric interventions during labour (e.g induction, augmentation of labour, electronic foetal monitoring, obstetric analgesia, instrumental vaginal delivery and episiotomy), and reduced episiotomy rates for the midwifery group but higher perineal tears. There was no difference in caesarean rates, maternal or child outcomes, intensive care baby unit admissions and similar rates for intact perineums. The duration of labour was longer in midwifery group and midwifery was more cost effective.(42)

Synthesis

There is no conclusive evidence that primary nursing in a residential setting is more effective than traditional nursing models. Team midwifery may result in fewer interventions during labour.

There is no conclusive evidence to indicate that any nursing model is effective at improving patient or staff outcomes in residential aged care. Team midwifery does deliver some benefits and no significant adverse outcomes and should be considered as a model for care delivery.

Nurse/Midwife-led care

The majority of the reviews under this sub-topic were related to nurse-led care, but one was related to midwife-led care. All reviews showed conflicting evidence for use of these roles. Nurse-led care is related to a service where the nurses have the clinical leadership.

Laurant et al. (2005) compared substitution of doctors by nurses in primary care.(43) The results were grouped by nurse role: First contact and ongoing care for all presenting patients, first contact care for patients wanting urgent attention and routine management of patients with chronic conditions. In the group *First contact and ongoing care for all presenting patients* the results showed that two out of 25 patient outcomes were significantly better with nurse-led care; others did not show any difference. For patient satisfaction, one out of 15 outcomes demonstrated significantly better with doctor-led care, while in 14 outcomes no significant difference was shown. None of the outcomes for patient compliance differed significantly.(43) Three out of 12 processes of care outcomes were significantly better with nurse-led care. No differences were detected in consultation rates. For tests/investigations, four out of 22 outcomes showed higher rate for nurses, the others showed no difference. When investigating the use of other health care services, one out of seven outcomes showed a significantly higher rate for nurses and the remainder showed no difference. Comparing direct costs did not show significant differences. For the group *First contact care for patients wanting urgent attention*, no differences were seen in patient outcomes and patient compliance. Most of the outcomes for patient satisfaction showed significantly better results for nurse-led care. Other patient satisfaction outcomes did not show any difference. The majority of measured process of care outcomes were better with nurse-led care (nurses provided more information).(43) All studies showed significantly longer consultations for nurses and nurses were more likely than doctors to recall a patient. No differences were seen in prescribing rate and use of other services. Two outcomes for test/investigations were measured, where one showed a higher rate for nurses. In the last group, *routine management of patients with chronic conditions*, one out of eight patient outcomes was better with nurses. Patient satisfaction was only studied in one study and showed significantly higher results for nurse-led care. No difference was seen in compliance. Significantly higher results were seen in patient knowledge for nurse-led care. No differences were seen in process of care, consultation rate and prescribing rates.(43)

Another review (Clark et al., 2010) investigated nurse-led support delivered by either telephone, community monitoring or nurse-led clinics.(44) Nurse prescribing showed greater reductions in blood pressure; telephone monitoring showed higher achievement of blood pressure targets; and community monitoring showed greater reductions in blood pressure. The review showed that a greater magnitude of reduction in blood pressure for nurse-led clinics compared with usual care were seen, however, no difference in achievement of blood pressure targets with nurse-led clinics were detected.(44)

The review by Halcomb and colleagues (2007) showed some evidence for practice nurse-led clinics in reducing cardiac risk factors in healthy adults, those with established disease and known risk factors.(45) They also showed that practice nurse-led clinics are particularly supported in relation to blood pressure management, cholesterol reduction, dietary modification and increasing physical activity.

For the review by Taylor (2005), nurse-led chronic disease management for patients with chronic obstructive pulmonary disease, no improvements were detected in quality of life, psychological wellbeing, disability or pulmonary function.(46) Apart from one study focusing on long term use of oxygen therapy, the evidence around readmission rates was unclear. No evidence was seen on dimensions such as patient satisfaction, self-management skills and adherence with treatment.

A review of the effectiveness of in-home community nurse-led interventions for the mental health of older persons determined that community nurses were not good at identifying mental health issues, particularly depression.(47)

When evaluating the effect of post-acute intermediate care in nurse-led units one review found it was unclear which services are best suited to which patients. However, evidence is stronger for nurse-led-units than intermediate care in care homes.(48)

Conflicting evidence for a range of outcomes (readmissions, hospital days, quality of life) were seen for nurse-led management of ambulatory complex patients in general health care.(49) For emergency department visits there was strong evidence that case management has no significant effect on the number of emergency department visits and evidence could neither be shown that case management has a positive effect on the functional status of patients. Moderate evidence was seen for patient satisfaction.

One review studied midwife-led care and more specifically a midwife-led model of care was compared to three other models of care mainly medical-led care.(50) Women who had midwife-led models of care were less likely to experience antenatal hospitalisation, regional analgesia, episiotomy and instrumental delivery and were more likely to experience no intrapartum analgesia/anaesthesia, spontaneous vaginal birth, feeling in control during childbirth, attendance at birth by a known midwife, and initiate breastfeeding, although there were no statistically significant differences between groups for caesarean births. Women who were randomised to receive midwife-led care were less likely to experience foetal loss before 24 weeks' gestation, although there were no statistically significant differences in foetal loss/neonatal death of at least 24 weeks or in foetal/neonatal death overall. In addition, their babies were more likely to have a shorter length of hospital stay.(50)

Synthesis

Some reviews showed evidence for improved care with nurse-led care, however the findings are equivocal. Mainly evidence was shown in the blood pressure management area and in the cardiovascular area. In the chronic obstructive pulmonary disease area there is not enough evidence to prove that nurse-led management is more effective than conventional approaches.

If nurses are appropriately trained they can produce as high quality care as primary care doctors, as well as achieve as good health outcomes for patients. It is also highlighted that nurses providing first care for patients needing urgent attention tend to provide more health advice and achieve higher levels of patient satisfaction compared with doctors. Nurse-doctor substitution has the potential to reduce the direct costs of care. However, this needs to be explored in a more thorough way.

There is little evidence that case management is an effective way to organise care due to conflicting results. However, patients report being satisfied about case management.

Midwife-led care confers benefits and shows no adverse outcomes. There are arguments that policy makers should consider midwife-led models of care more, to achieve clinically important improvements in maternity care. But considerations are needed around how financing of midwife-led services can be reviewed to support this.

Emerging roles

Three reviews related to emerging nursing roles, for example, specialist nurses in multiple sclerosis, respiratory nurse and home-based nursing health promotion for older people.

One review examined the role of specialist nurses in multiple sclerosis.(51) Multiple sclerosis patients and their carers found the multiple sclerosis specialist nurse to be helpful, particularly in improving their knowledge of the illness, ability to cope, mood and confidence about the future. The general practitioners also identified the nurse to be helpful with their multiple sclerosis patients and almost half of the general practitioners stated they would pay for the services of a multiple sclerosis specialist nurse if their practices became fund holding. But caution needs to be taken as these findings are based on only one study included in the review.(51)

A review of the effectiveness of home based nursing health promotion for older people found the following output variables: effectiveness, efficiency and duration of follow-up.(52) The findings showed that in four of the eleven studies investigating mortality rates there was a significantly lower mortality rate for the intervention group in comparison to the control group. Six of the included studies in this review looked at psychosocial factors. However, only one study verified favourable effects by reducing the level of depression. Half of the studies that examined functional status showed that clients of in-home preventive programs are more likely than controls to experience and retain functional gains. The effect of the intervention on caregivers was investigated in one study, where the caregivers in the intervention group expressed a significantly higher level of satisfaction with care than those in the usual care group.(52)

In more than half of the studies investigating the impact of the intervention on hospital admission and/or hospital stay, the intervention group showed either a significantly lower number of admissions to a hospital or a lower number of days spent in a hospital compared to the control group. The review found one study that showed a reduction in hospital stay for younger patients only (aged 65 to 74 years). Almost half of the included studies determined that the intervention group had a significantly lower use of nursing homes compared to the control group. Six out of nine studies investigating the impact of the intervention on use of other health and social services showed a higher use of services such as primary health care providers and services promoting socialisation compared to the control group. The majority of the included studies evaluated the impact of a home-based-nursing health-promotion intervention on use of services, however not all of them used a full or partial economic evaluation. Cost savings due to the prevention of nursing-home admissions and hospital admissions were seen in three studies.(52)

The review by Wong et al. (2012) pointed out that outreach nursing programmes for people with chronic obstructive pulmonary disease improved disease-specific health-related quality of life.(53) The use of the St George's Respiratory Questionnaire showed significant improvements following the intervention. However, the use of the Sickness Impact Profile and SF-36 showed equivocal evidence. The review could not demonstrate significant change in the number of hospitalisations with the intervention. However, one of the included studies had high heterogeneity and if excluded, a significant increase in hospitalisations was seen. No significant differences were detected for mortality, lung function and exercise testing.(53)

Synthesis

Research findings are insufficient to draw conclusions on the impact of these emerging roles. Recommendations are provided with caution due to heterogeneity of methodology and methods in previous research. However, specialist opinion from neurologists and nurses, and comments from patients with multiple sclerosis supporting the provision of multiple sclerosis specialist nurses was seen as best available evidence. Recommendations were made for

provision of care by nurses with formal training in gerontology. In addition, it was argued for a flexible, client-centred, and interdisciplinary approach to care delivery and continuity of nursing-care provider.

Nurse Practitioners/Nurse Midwives

Only a few reviews (n=2) were related to the Nurse Practitioners/Nurse Midwives and their impact on the delivery of nursing care.(54, 55)

Brown and Grimes (1995) summarised their findings according to random allocation to provider or not random allocation to provider.(54) For patients who were allocated randomly there was greater patient compliance with treatment recommendations with nurse practitioners than with physicians. When allocation to provider was not randomised, the findings showed greater patient satisfaction and resolution of pathological conditions for patients treated by nurse practitioners. However, on most other variables in controlled studies, the nurse practitioners were equivalent to medical doctors. In studies that controlled for patient risk, nurse midwives used less technology and analgesia than did physicians in intrapartum care of obstetric patients. Nurse midwives achieved neonatal outcomes equivalent to those of physicians.(54)

Similar results were shown by Horrocks et al. (2002), who identified higher patient satisfaction for nurse practitioners than for doctors or no significant difference. Further on, nurse practitioners identified more physical abnormalities in; gave more info to patient; more complete records and better communication, more advice on self-care/management.(55)

Synthesis

There is evidence that treatment by nurse practitioners generates greater patient compliance with treatment recommendations, greater patient satisfaction and resolution of pathological conditions. However, on most other variables, the nurse practitioners were equivalent to medical doctors. Nurse midwives used less technology and analgesia than did physicians, however they achieved neonatal outcomes equivalent to those of physicians. The authors request sensitive outcome indicators of the primary care process, not just measures of medical diagnosis and treatment. They also argue for more research that compares processes of care and outcomes of different health providers. Finally, the cost-effective question needs to be addressed more frequently.

Guidelines for practice

Four reviews were related to guidelines of practice and how use of these could improve the patient care.

Thomas et al. (1999) evaluated interventions using guidelines aimed to change professional practice.(56) Findings indicated that there is some evidence to suggest that educational interventions may be of value, rather than passive dissemination. However, there was insufficient evidence to recommend any particular dissemination strategies, but active interventions seem to be more effective than passive ones. Another important factor highlighted by the authors was the use of opinion leaders/experts in change. However, they concluded that there is no evidence to suggest that interventions which work for doctors would work for nurses and allied health professionals.(56)

A more recent review (Thomas et al., 2009) evaluating the effectiveness of dissemination and implementation strategies for guidelines targeting healthcare professionals detected improvements in processes of care and outcomes of care when guidelines and dissemination and/or implementation strategies were used.(57) Because of poor methodologies conclusions could not be drawn for studies comparing different dissemination and implementation strategies. Included skill-substitution studies supported the hypothesis that

there is no difference in care given by nurses using clinical guidelines and standard physician care.(57)

Thompson et al. (2008) identified that community nurses were not good at identifying mental health issues, particularly depression.(47) But the use of a standardised screening tool improved detection rates of mental health problems/part depression. Use of comprehensive nursing packages (which included screening and assessment around mental health) were also effective. On the other hand, the authors could not find evidence to suggest any long term benefits of any of the interventions.(47)

The findings by Clark et al. (2010) indicated some evidence that nurse-led interventions for hypertension in primary care should include an algorithm to structure care and can deliver greater blood pressure reductions than usual care.(44)

Synthesis

The reviews showed limited evidence for any recommendations. However, use of a structured algorithm could improve patient care and the use of a standardised screening tool improved detection rates of mental health problems/part depression. The more recent review by Thomas et al. (2009) recommends the use of theory based approaches and in contrast to an earlier review recommends applying the evidence of what works for doctors to nurses and allied health groups.(57)

RESULTS RELATING TO EDUCATION AND CONTINUING PROFESSIONAL DEVELOPMENT

Evidence around the effectiveness of undergraduate nursing education and the impact of continuing professional development activities on specific nursing skills was explored under this broad theme.

Number of included reviews and studies

Eight systematic reviews reporting on 185 studies were reviewed under the theme of Education and Continuing Professional Development.

Organisation of results

Despite education playing a vital role in the development of nursing skills, confidence, satisfaction and learning outcomes there were relatively few systematic reviews of acceptable quality from which to draw evidence. The review findings were grouped into four subthemes. The first of these is Simulated Learning, which is concerned with the development of clinical skills through the use of medium and high fidelity simulation facilities or equipment. The second subtheme is Educational Curriculum which explores the effect of different course structures on undergraduate learning. The third subtheme, Inter-Professional Education, relates to the utility of education programs that work to create integrated multidisciplinary teams. The fourth subtheme is Continuing Professional Development, which examines the use of short courses and in-service training for the development of nursing skills post registration.

Simulated Learning

The majority of systematic reviews in this area focussed on populations primarily made up of medical students. Many studies also struggled to implement effective measures to properly assess the efficacy of their programs. The reviews which were included in this project often found that while some gains can be made through the use of simulations that these skills

may be lost over time. It is therefore with caution that the findings from these simulation studies can be attributed to nursing. For example, Laschinger et al.'s (2008) review acknowledged that the majority of their findings were for medical students. It was possible to extract individual results for nursing students for some studies, however, there was no synthesis of purely nursing relevant information.(58)

Cant and Cooper (2010) investigated simulation-based learning in nurse education, comparing quantitative evidence for the effectiveness of medium to high fidelity simulation, employing manikins, with other educational strategies.(59) However, the interventions which were examined varied in terms of administration, exposure and assessment; therefore no meta-analysis could be undertaken. Seven studies included in this review used at least one validated assessment measure, for the other studies this information was unclear. Nevertheless all studies reported simulation as a valid teaching and learning strategy. Six of the studies demonstrated additional gains in knowledge, critical thinking ability, satisfaction or confidence compared with the control group (ranging from 7-11%). The reviewers concluded that simulation may have some advantage over other teaching and learning methods. However, the small sample and non-representative nature of the studies must be born in mind. In many studies, both the experimental group and the control group experienced interactive teaching techniques thus limiting the fidelity of results relating to the effect of the simulation intervention itself.(59)

Synthesis

Despite the significant investment in all types of simulated learning environments in nursing and other healthcare education areas, there is little robust evidence to demonstrate its effectiveness as a learning intervention. The research that has been undertaken is characterised as being small in terms of numbers of participants and non-representative in sample type. Further studies are needed which compare actual assessments of students' performance post-education. Additional well-designed studies are needed to quantify simulation education outcomes.

Education Curriculum

This review also found that relatively little work has been undertaken on testing the different curriculum designs for undergraduate nursing programs such as; integrated curriculum, subject-centred curriculum, problem-based learning, and integrated critical thinking models.(60) Notably there were no systematic reviews on the nature of the clinical placement (duration, design, facilitation or support). In addition the review that was included tended to be descriptive in nature, reflecting the stage of development of research in the area.

Jayasekara et al. (2006) undertook a systematic review of undergraduate nursing curricula for nursing staff outcomes, consumer outcomes and system outcomes.(60) They identified four undergraduate nursing curriculum models; integrated curriculum, subject-centred curriculum, problem-based learning (PBL), and an integrated critical thinking model. They found it was possible to examine the effectiveness of an integrated curriculum model and a subject-centred curriculum model; however, the other two models could not be compared because of a lack of evidence. Based on above findings, it is difficult to draw a conclusion regarding the effectiveness of integrated versus subject-centred approaches in undergraduate nursing curricula. The reported studies on PBL nursing curricula revealed a number of variants of PBL in terms of definition, implementation strategies and evaluation methods. It is therefore difficult to draw a conclusion regarding the effectiveness of PBL approach in nursing curricula. It was also difficult to draw a meaningful conclusion regarding the effectiveness of integrated critical thinking curriculum model in undergraduate nursing education because of limited number of high-quality comparative studies, and the high level of variability in the results of the reported studies.(60)

Synthesis

The evidence regarding the effectiveness and appropriateness of undergraduate nursing curricula is notably weak because of the paucity of high quality comparative studies and meaningful outcome measures in available studies. Therefore, no strong conclusion can be made regarding the effectiveness and appropriateness of undergraduate nursing curricula. There is some low-level evidence to suggest that some concepts of nursing curricula (e.g. ageing concepts, liberal education) can be effectively integrated into the curricula, and most technical components such as physical assessment can be best presented in the subject-centred model. Further research is required to examine the relationships between undergraduate nursing curricula and patient care outcomes. Urgent attention needs to be given to developing an evidence base around the effectiveness of different clinical placement approaches.

Inter-Professional Education (IPE)

The other area of interest was inter-professional education with two systematic reviews included in the analysis.(61, 62) The findings of these two reviews were equivocal, with inter-professional education being seen as ‘a good thing’ but little real evidence to show either how or why it works. There were no clear definitions of inter-professional education provided in either systematic review nor were there detailed explanations of the mechanisms used to facilitate learning. These limitations again reflect the state of the development of the research in this field and the consequent fact that the strength of the evidence base for the effectiveness of IPE is relatively weak.

Hammick et al. (2007) investigated staff development to enable competent and confident facilitation of inter-professional learning is a key mechanism for effective IPE.(61) They found that participants bring unique values about themselves and others into any IPE event which then interact in complex ways with the mechanisms that influence the delivery of the educational event. Authenticity and customisation of IPE are important principles so that they reflect appropriate and relevant service delivery settings in order to optimise positive experiences for the participants. A knowledge of, and application of principles of adult learning were found to be key mechanisms for well received IPE. They also found that IPE was generally well received by participants and enabled practitioners to learn the knowledge and skills necessary for collaborative working. However, IPE is less able to positively influence attitudes and perceptions towards others in the service delivery team.(61)

Reeves et al. (2008) undertook a review of IPE in the emergency department setting, including eight primary studies.(62) Four of these studies indicated that IPE produced positive outcomes in the following areas: emergency department culture and patient satisfaction; collaborative team behaviour and reduced of clinical error rates; management of care delivered to domestic violence victims; and mental health practitioner competencies related to the delivery of patient care. In addition, two of the six studies reported mixed (positive and neutral) outcomes and two studies reported that the IPE interventions had no impact on either professional practice or patient care.(62)

Synthesis

Staff responsible for developing IPE should not assume that groups of learners (e.g. those with similar professional backgrounds) will respond to IPE in the same way. Staff development in the facilitation of IPE is essential to its effectiveness. Educators need to be aware that a learner’s reaction to IPE is related to a wide range of factors. Learning about working inter-professionally in a context that reflects students’ current or future practice is important for effective learning. IPE curriculum developers need to construct programs which structure teaching with consideration for the adult learning needs of participants.

IPE research which reports upon, and contemplates the effects of, cohort characteristics such as student numbers and professional mix on the outcomes of the IPE would further our

understanding, and management, of this complex genre of professional education. More rigorous comparisons of individual studies would be aided by the collection of data through the consistent application of robust tools which identifying the mechanisms employed by IPE programs to assist in positively changing the attitudes and perceptions of participants. Adoption of a common outcomes model for measuring the 'products' of IPE would also enable more robust comparisons between individual studies. More evaluations of IPE in real and simulated practice settings are needed to strengthen our knowledge of mechanisms that lead to positive behaviour changes, patient care and service delivery improvements. Future randomised controlled studies explicitly focused on IPE with rigorous randomisation procedures, allocation concealment, larger sample sizes, and more appropriate control groups would improve the evidence base of IPE. These studies should include data collection strategies that provide insight into how IPE affects changes in healthcare processes and patient outcomes as research to date has not sufficiently addressed this critical issue.

Continuing Professional Development

Despite the significant investment in professional development, it is noteworthy that only three systematic reviews were suitable for inclusion in this review.(63-65) Two were on the subject of the effectiveness of stress reduction training approaches on staff.(64, 65) The other topic area was a systematic review of the effects of education in palliative care at the undergraduate and postgraduate levels for nurses, students and patients.(63)

Edwards and Burnard (2003) and van Wyk and Pillay-van Wyk (2010) both looked at interventions (education and management strategies) to reduce stress in the nursing workforce.(64, 65) Edwards &Burnard (2003) investigated; relaxation techniques, training in behavioural techniques, stress management workshops and training in therapeutic skills. These were found to be effective stress management techniques for mental health nurses. However, methodological flaws detracted from the rigour of many of the studies reported thus influencing the reliability of the findings.(64)

vanWyk and Pillay-van Wyk(2010) reviewed a total of ten studies with a combined total of 716 participants. Two studies assessed the effects of management interventions on stress, job satisfaction and absenteeism. Low and moderate intensity stress management training interventions failed to demonstrate any benefit on levels of burnout or staff satisfaction. Whereas longer term interventions with booster or refresher sessions had some benefit. One study did show the beneficial effect of high intensity, stress management training intervention on burnout. However, there is insufficient evidence for the effectiveness of stress management training interventions to reduce job stress and burnout. The evidence was limited around the effectiveness of management interventions to improve staff morale and job satisfaction. Management interventions involving process consultation for nurse managers to build problem solving capabilities in interdisciplinary teams and skills for managing organisational change demonstrated increases in job satisfaction, but failed to show an effect on absenteeism. Low level evidence suggests that longer term interventions with refresher or booster sessions may have more sustained positive effect, but this requires further testing.(65)

Adriaansen and van Achterberg (2008) studied the effects of education in palliative care at the undergraduate and postgraduate levels for nurses, student nurses and patients.(63) The review demonstrated that the palliative care courses are successful but the majority of the studies reported weaknesses in the study designs. It remains unclear if these effects also led to improvements in patient care. Integrated courses focused on a number of themes with a variety of didactical methods (including practical experience) were reported as being the most successful. Content of palliative care courses included communication and attitude, empathy, pain and symptom management and combined courses. For outcome measures, both validated and self-constructed rating scales, with unclear validity, were used. Different

effect measurements were used and therefore it was difficult to compare the studies. In general, positive effects were found on the communication skills of nurses, but this did not lead to improvements at the patient outcome level. It cannot be concluded that courses of longer duration have a stronger effect than short courses.

Synthesis

Longer term interventions with booster or refresher sessions may have a more sustained positive effect in managing stress reduction programs. However, there is limited evidence that management interventions can improve staff morale and job satisfaction given only two studies. More trials are needed to test effects of longer term stress management training and interventions. More research is needed to explore the effectiveness of specialist training programs (in this case palliative care) on undergraduate and postgraduate nursing skills and competencies

More research is needed to understand the most effective ways of delivering professional development to the workforce. The lack of robust evidence in this area is a matter of concern given the investment.

RESULTS RELATING TO THE NURSE/MIDWIFE-PATIENT RELATIONSHIP

Of interest under this theme was an exploration of factors that relate to the way nurses, midwives and patients interact in the direct care encounter and how this experience may influence the quality of care.

Number of included reviews and studies

Under the theme of Nurse-Patient Relationship three systematic reviews were included and these were reporting on a total of 63 studies.

Organisation of results

Under the theme of nurse-patient relationships two subthemes were identified. The first of these was Fundamentals of Care which concerns the manner in which essential care is delivered. The second subtheme of Nursing Sensitive Patient Outcomes relates to the healthcare outcomes for patients linked directly to the care provided to them by nurses.

Fundamentals of Care

Whilst there is a growing literature on the Fundamentals of Care and what they cover (66, 67), the systematic reviews included in this section only looked at one fundamental of care, communication. Effective communication between nurses and their patients is a central part of care and relies not only on the individual characteristics of staff, patients and family but also on ward environment and culture to facilitating interactions. None of the other fundamentals of care (e.g. hygiene, privacy, dignity, eating and drinking, elimination, safety and medication) was the subject of a systematic review. This may be because the research approaches required to investigate these phenomena are not linked to the discourse around levels of evidence and effectiveness.

Tay et al. (2010) looked at communication between RNs and adult oncology patients in an inpatient setting.(68) Nurse factors that facilitated communication included genuineness, having supportive facilitation skills and level of competence. Nurse to patient communication was found to be less effective during psychological assessments; emotionally-charged situations; where there was a high task orientation approach to care; where there was a fear

of own death; and when the nurse had low self-awareness of their own verbal behaviours. Patient factors that facilitated nurse patient communication included active participation of patients in their own care and information seeking behaviour. Patient factors which inhibited communication were an unwillingness to discuss the disease, or their feelings, and a preference to seek emotional support from family and friends. Additionally, a supportive ward environment increased the use of facilitative behaviour in nurses, whereas the existence of conflict among staff increased the use of blocking behaviours. The role of post-basic training in improving communication remained inconsistent.(68)

The second review by Haesler et al. (2006) looked at the relationships between family members and staff working in a care of older adults institutional setting.(69) They found that support from administration and management is more likely to result in positive effects from interventions to promote constructive interactions between staff and family. Family members' perceptions of their relationships with staff showed that a strong focus was placed on opportunities for the family to be involved in the patient's care. Staff members also expressed a theoretical support for the collaborative process; however, this belief often did not translate to the staff members' clinical practice. Staff were frequently found to rely on traditional medical models of care in their clinical practice and focussed on maintaining control over the environment, rather than fully collaborating with families.(69)

Four factors were found to be essential to interventions designed to support a collaborative partnership between family members and healthcare staff: communication, information, education and administrative support. In terms of developing constructive staff-family relationships it was important to address power and control issues while also developing negotiation techniques. Managerial support involved addressing staff workloads and managing of staffing issues so that relationships were not compromised by these external factors. The introduction of care models which focused on collaboration with families; and providing practical support for staff education, were essential to gaining sustained benefits from interventions designed to promote constructive family–staff relationships.(69)

Synthesis

In their study Tay et al. (2010), recommend that institutions design ward structures, including ward culture and nurses workload, which support and encourage nurses to be person-oriented. Cultural diversity in patient and nurse backgrounds as well as the development of post basic communication skills are also important aspects to consider. These recommendations reflect the link between the context in which nurses and patient interact both in terms of culture and resources as well as the need to ensure relevant skills and competencies.(68)

Haesler et al. (2006) concluded that the incorporation of staff and family education into interventions designed to promote constructive staff–family relationships is highly recommended.(69) Education should include relationship development, power and control issues, communication skills and negotiating techniques. Support from administration and management staff is more likely to result in sustained positive effects from interventions designed to promote constructive interactions between staff and families. Support should include addressing workloads and staffing issues. Staff characteristics most important to the development of constructive relationships included open and honest communication, working in partnership, providing information and promoting the uniqueness of the patient.

Nursing Sensitive Patient Outcomes (NSPO)

Nursing sensitive patient outcomes (also termed nursing/nurse sensitive outcomes – NSOs) were studied from a range of perspectives in the reviews identified in this umbrella review. NSPOs were defined as an outcome measure of clinical efficacy in intervention studies, and as indicators of efficacy in inter-professional practice studies. However, only one review, which included 21 studies, focussed on NSPOs as a specific product of the nurse-patient relationship. This research revealed that although the term NSPO is used in a range of settings and in a variety of different studies there does not appear to be one unifying definition of what a NSPO is or indication of the variance in NSPOs across care settings.(70)

Green et al. (2011) conducted a systematic, narrative review which investigated the effectiveness of nursing management strategies on stroke patient outcomes sensitive to nursing interventions. 'Nursing-sensitive outcomes (NSOs) are those outcomes arrived at, or significantly impacted by nursing interventions' (70). They also noted that definitions used to measure the outcomes varied between studies.

NSPOs have been identified and validated across a range of care settings. The initial research on NSPOs began in the acute care setting with a main focus on outcomes such as patient safety (falls) and skin integrity and, more frequently, with patients on general medical or surgical wards. The most current research on NSPOs has expanded to include settings such as primary care, specialised clinical areas including cardiac and intensive care, rehabilitation, home care, ambulatory community care and long-term care. The review also demonstrated that not only is the range of settings expanding where NSPOs are being measured and used to improve care, these NSPOs are now being considered for all nursing disciplines and preparation levels. Despite these advances, very little evidence exists documenting the relationship between NSPOs and acute stroke patient outcomes.(70)

Synthesis

Nurses play an active role in patient care throughout the care continuum, as such work to identify nurses' impact in all care settings should be a priority area for future research. Further research is needed to strengthen the evidence base for performance measures that are sensitive to the role of all team members. Identification of discipline-sensitive outcomes could also contribute to better understanding by the inter-professional team members of each other's role and, thus contribute to more collaborative, supported patient-centred care.

When the outcomes from the included research were examined, it was discovered that the definitions used to measure the outcomes varied between studies. This is an important limitation of NSPOs and presents a significant challenge for researchers, managers and front-line nurses who want to understand the meaning of the results by comparing them across organisations and settings. An additional challenge in consistency of measures is the lack of data sources to collect and access NSPO data.

DISCUSSION

The aim of this umbrella review is to provide the best available evidence with regard to factors that are known to impact upon the ability of nurses to deliver high quality patient care. The following is a discussion of the main findings of the review with implications, and where appropriate, recommendations for practice, research, education and policy. The breadth of the topic, and timeframe and resources available to conduct the review resulted in a pragmatic decision to include only systematic reviews; to conduct an umbrella review. This resulted in a number of limitations that will be discussed and need to be considered in light of the recommendations.

In discussing the evidence identified by the systematic review process, it is conventional to also identify the level of that evidence. All the evidence identified in this umbrella review was synthesised from systematic reviews. This does not mean the evidence should be considered at the highest level; level 1 for most evidence hierarchies. Level 1 evidence in most cases does represent evidence from systematic reviews but this is qualified by the provision that the primary studies of the review are of the highest level e.g. RCTs for quantitative reviews. The results of this review are synthesised from multiple reviews representing different types and levels of evidence and therefore it would be misleading to attach levels of evidence to individual recommendations.

The discussion will follow the framework used to conduct the review and is therefore organised in terms of the major themes of context, organisation of nursing/midwifery, education and continuing professional development and finally the nurse/midwife-patient relationship.

An overview of the results for each major theme is provided with corresponding implications for practice, research, education and policy where appropriate

CONTEXT

The specific review question for this component of the project was ’What factors related to the context of care influence the nurse’s and midwife’s ability to provide quality patient-centred care?’ We have used the term Positive Practice Environment (to define the optimal context in which nursing practice ought to occur). The evidence examined both factors that impact on the positive practice environment and in turn what impact the positive practice environment has on nurses and their ability to provide quality care and subsequently improve outcomes for patients. The evidence identified in this review examined both programs designed to improve the practice environment such as the Magnet Program and specific characteristics and structures that influence the practice environment. Embedded in this overarching component were a range of other organisational factors that were identified as enhancing nursing practices including: teamwork, leadership, autonomy of practice, infrastructure and mechanism to promote effective use of technology and evidence based guidelines.

The evidence is clear that positive changes can be made to the practice environment by implementing a combination of approaches, structures and strategies designed to increase the level of professionalism in the nursing establishment of hospitals. The program that has been specifically evaluated is the Magnet program from the USA.(16) The evidence indicates that working within this environment has a positive impact on nurses working within these organisations including reduced levels of exhaustion (physical and emotional) and increases

in satisfaction and rates of intention to stay. Although it would seem logical that this would have a flow on effect for patient outcomes this has not been demonstrated in evaluations of the Magnet program to date. Further research is required to determine the impact on patient outcomes from programs such as Magnet.

Overall the evidence identified was very limited and mostly inconclusive with regard to teamwork practices; however there was evidence to suggest working within teams resulted in an increase in accountability, that commitment in a team produces greater cohesiveness and that enthusiasm and motivation increased the effectiveness of a team. Social support within a team increased staff satisfaction levels and reducing conflict within a team could improve satisfaction levels, team performance and retention rates. Communication within a team was a characteristic that led to improvements in quality of care and length of stay.

Teams require leaders and there was considerable evidence that examined the impact of leadership on the practice environment. The approach for much of this research was to compare different leadership styles and their impact on nurses and patient outcomes. Although the conclusion was that, no one leadership style or attribute could be said to definitively result in positive changes to the work environment it could be demonstrated that leadership style and various attributes did make a difference. The impact on nurses can be felt with regard to job satisfaction and staff turnover. The impact on organisations relates to unit effectiveness, staff effort and the overall organisational structure. Positive leadership also was found to increase patient satisfaction. These outcomes however were often attributed to a specific style of leadership or leadership attribute. Transformational leadership in particular had positive impacts on patients and staff but other styles and attributes also had a significant impact. The evidence however was limited in quality despite there being a reasonably large number of studies.

The nature of the practice environment is obviously influenced by the relationships with the disciplines who work with nurses. These relationships continuously provide circumstances where there is a potential for differing views on goals and decision making in regard to patient care. Power differentials result in nurses perceiving a loss of autonomy of practice, particularly when decisions being made are believed to be detrimental to the patient. The impact on nurses is a level of moral distress. There is some evidence to suggest that ultimately this impacts on patient outcomes with some studies having identified an impact on patient mortality. In light of these findings there is an increasing interest in inter-professional strategies to improve relations between disciplines and in turn improve patient care through better communication and understanding. Although the evidence suggests positive outcomes in relation to these strategies, the evidence base is considered too small to make specific recommendations.

The concerted effort to promote evidence-based nursing practice cannot be ignored. Many strategies and structures have been evaluated at both a project/local level and at an organisational level to promote and support evidence-based practice. It is common to see conclusions from this research that a positive effect cannot be attributed to a specific intervention. That single strategies cannot be deemed to work every time and in every situation should not mean they are not useful in practice. Indeed these strategies are used mostly in combination and therefore it is not useful to consider effectiveness in terms of single interventions. A multi-focussed approach is commonly required, should be taken and has the potential for improvements in knowledge, practice and patient outcomes.

Increasingly technology is changing the practice environment. Electronic documentation systems are becoming more commonplace but there is a dearth of research evaluating their effectiveness. In addition, when these new technologies are introduced the focus is largely around the mechanisms of documentation rather than the content. There is a growing recognition that the problem with nursing documentation is not so much the mechanism of documentation but what is being documented and for what purposes. This suggests that if documentation systems are going to improve nursing practice then more emphasis needs to

be placed on collaborating with those that will use the system. Just as with electronic documentation, computer decision support systems are increasingly becoming a part of the practice environment. Considering the significant resources being expended on computer decision support systems, the lack of robust research is of considerable concern.

Not only does the practice environment impact on the quality of care nurses provide but the state of the environment can perpetuate further negative changes. Staffing levels in particular are both a characteristic of the environment and a mechanism to influence staff to leave resulting in a further degradation of a positive practice environment. The pattern is cyclical where a poor practice environment encourages staff to leave. This has a potential to increase workloads which degrades the environment further. Within an organisation this pattern needs to be recognised and action taken to break the cycle.

Australian nurses work in a multi-cultural environment in terms of the patients they care for and increasingly the staff with whom they work. This provides many challenges but evidence suggests embracing cultural diversity can positively impact on the environment in which nurses work. To improve cultural competence organisations need to embed both education and training as well as appropriate processes and practices within organisational structures. Healthcare providers need a particular skill set to deliver culturally competent care and this can be assisted by recruiting staff from diverse backgrounds. Although there is evidence that this will assist organisations to deliver culturally competent care the impact on nurses, patients and the practice environment has not been explored with any robust research. Considering the increasingly multi-cultural nature of the healthcare environment this is a dominant issue.

Finally the question of whether the funding (not-for-profit or for-profit) of an organisation providing health care makes a difference in terms of quality is complex. The evidence suggests a trend that would indicate higher quality care in not-for-profit aged care facilities, but the evidence is not sufficiently robust to determine specifically the mechanisms that may result in measurable differences.

Implications for Practice

Organisations should use evidence based approaches/interventions to create and sustain a positive practice environment particularly around nurse autonomy and inter-professional collaboration, shared governance models and nursing leadership. The challenge remains to determine which interventions work best and in what circumstances.

Organisations should identify areas of their organisation that are experiencing staffing shortages and investigate why these shortages are occurring. They should target those areas for additional support, particularly for staff members experiencing raised levels of stress and burnout. Arguably these issues are played out at a national and global level also.

Nurses' involvement in decision about unit policy should be encouraged. Team process and structures should encourage and promote accountability, enthusiasm, commitment and motivation, providing support through effective communication.

Organisations should consider how they can foster positive leadership at various levels within their organisation. They should also consider the span of control of the nurse leaders in their organisation as too wide a span of control can adversely impact on a leaders effectiveness.

Organisations need to consider support structures for nurses experiencing moral distress. This support should be provided in a non-judgmental manner with appropriate structures being identified.

Organisations should consider efforts to promote better inter-professional relations. Inter-professional rounds and meetings should be considered.

When a change in practice is required a range of strategies should be available to be used in combination and they should be selected based on the context in which the change should occur.

Nursing staff should be actively involved in the design of nursing record keeping systems.

Organisations should explore their ability to provide culturally competent care. Organisational processes and structures should be reviewed and redesigned to better meet the needs of culturally diverse groups.

Implications for Research

There is certainly a need to evaluate the clinical and cost effectiveness of strategies/interventions to create and sustain a positive practice environment. Specifically the impact on patient outcomes needs further robust evaluation.

Further investigation is required about what contexts would most benefit from a team based approach to care, what strategies are effective in building the positive characteristics of teams and the financial implications of team based approaches to care.

The association between leadership styles, attributes and various outcomes requires further research. Pragmatically there should also be further research on strategies that organisations can use to promote, monitor and measure the impact of positive leadership on nurses, patients and the environment in which care is provided.

There is a need to evaluate the effectiveness of strategies to reduce moral distress within nursing and to conduct higher level studies to measure the impact of moral distress on nurses, patients and the environment in which care is provided.

Specific interventions to promote inter-professional relationships need to be subject to larger robust trials. Outcome measures should include the impact on the working environment and patient outcomes.

There is a growing body of evidence of randomised and non-randomised controlled trials that have evaluated a range of strategies to disseminate and implement clinical guidelines (and more broadly other forms of evidence to inform practice). The conclusion is that the effect cannot be attributed to any one specific strategy and that no one strategy will work in every circumstance. Researchers should therefore consider approaches that can evaluate multiple strategies to determine what works for who and in what context.

Research needs to focus on the fundamentals of nursing documentation, what needs to be recorded and how it will be used.

Further research is required to examine what influences nurses' perceptions of staff shortages and workload. The relationship between staffing shortages, the impact on the practice environment and those working within this environment should be investigated in a wider context.

Further research is required to examine the impact of culturally competent care on staff, patients and the practice environment. This should include culturally competent care for Aboriginal and Torres Strait Islander peoples.

Further research is required to examine the impact of various funding models including not for profit and for profit in contexts other than aged care.

Implications for Education

The design of nursing curricula should consider the significant impact that a positive practice environment has on nurses and on patient outcomes. Specific areas that require increased emphasis are leadership, inter-professional practice and autonomy of practice.

Nurses should be provided with access to education programs to identify moral distress in themselves and others.

The nursing profession should educate the community about nursing care and the context in which it is provided.

Education on culturally competent care should be embedded into ongoing professional development for nursing staff.

Implications for Policy

The impact of a positive practice environment on the nursing workforce and patient care need to be explicitly acknowledged in future workforce policy documents at federal, state and organisational level.

Policy initiatives should be evaluated in terms of the impact on the practice environment.

Policy initiatives should be directed at increasing nurse autonomy of practice and confirming the leadership of nurses within the health system.

Policy initiatives around capacity building and increasing the effectiveness of the healthcare workforce need to embrace the evidence around positive practice environments, leadership, autonomy, teamwork and effective use of technology in the work environment.

Organisation of Nursing/Midwifery

The findings identified that RNs make a difference and the way nursing/midwifery is organised influence nurses' and the midwives' ability to provide quality patient-centred care. There is evidence that increased RN staffing and a higher ratio of RNs is associated with better patient outcomes. There is no evidence for improvement in quality of patient care, stress and job satisfaction in relation to shift length.

There is no conclusive evidence that any nursing model, inclusive of primary nursing is more effective at improving patient or staff outcomes in a residential setting. However, team midwifery or midwife-led care does deliver some benefits and no significant adverse outcomes and should be considered as a model for care delivery.

The results show that there is some evidence for improved care with nurse-led care, though the findings are equivocal. However, suggestions are made that if nurses are appropriately trained they can produce as high quality care as primary care doctors, as well as achieve as good health outcomes for patients. Also, using guidelines may improve patient outcomes but any standardised tools need to be quick and simple to be useful.

There is some evidence that treatment by nurse practitioners generates better or equivalent patient outcomes when compared to medical officers and physicians. When considering emerging roles, mainly in the community setting, the evidence is weak, however medical specialist opinions and comments from patients support the provision of specialist nurses.

Implications for Practice

Based on current evidence it is difficult to set fixed standard RN quotients. However, it is important to ensure units have a high proportion of RNs in the skill mix and therefore the recommendation is that all unit leads should be actively engaged in determining the optimal skill mix for their patient group.

There is no clear relationship between shift length and health provider and patient outcomes. Managers should be vigilant of behaviours that identify potential stress in their workforce and take appropriate action.

Team midwifery needs to be considered as a model of care to improve patient outcomes.

Nurse-led care is appropriate for some conditions and the literature indicates that nurse-doctor substitution has the potential to reduce the direct costs of care.

Awareness of mental health problems in older home care patients needs to be raised and a screening tool to detect mental health problems/depressions could be useful but needs to be quick and simple to use.

Implications for Research

Nursing sensitive patient outcome indicators of the primary care process, not just measures of medical diagnosis and treatment are required.

Research that compares processes of care and outcomes of different health providers is urgently required.

The need for further research on 'cost-effectiveness' is highlighted in several systematic reviews. The cost-effectiveness of nursing staff needs to be examined, as well as the cost-effectiveness of nurse practitioners and nurse midwives. The literature indicates also that nurse-doctor substitution has the potential to reduce the direct costs of care. However, this needs to be explored in a more thorough way. In relation to this, the impact nurses have on doctor behaviour and workload is not clearly described, despite the general view that nurses can 'save' doctors' time.

Research to address the role of staffing on the effectiveness of patient care and measures of how to estimate the relationship between these variables is required. There is also a need for standardisation of nursing sensitive patient outcome indicators and measures of nurse staffing.

Standardisation of measures of staffing and clinical outcomes is recommended. Qualitative research to improve the understanding of the causal mechanisms and clarify what it is about nursing skill mix that affects patient's outcomes is suggested.

There is a need for well designed robust studies investigating the association between shift length and the quality of patient and health provider outcomes.

The community-based caseload model of midwife-led care and midwife led models of care in general require further evaluation.

Research using a concurrent control group to evaluate the effectiveness of nursing models in residential aged care is also needed.

More research is required to find out which nurse-led services are best suited to which patients and which configuration of services represents the most cost effective solution. Further on, safety aspects and identifying criteria for suitability for nurse-led units need to be studied.

To find out what works when implementing practice guidelines there is a need for more studies comparing single and multiple intervention approaches within the same populations.

'Nurse-led chronic disease management requires more research which includes outcomes such as patient satisfaction, self management, coping and adherence and the effects on carers.

In general, there is a request for the use of more sound methodology using for example; clear definitions, more random allocation and sampling, blinding outcome assessors to the intervention, and maximising the numbers of practitioners (particularly nurses) rather than numbers of patients, in order to reduce the effect of any individual practitioner on outcomes. Further on, interventions need to be focused and well-defined, as well as using sufficient statistical power to detect clinically important differences. Further well-designed, conducted and reported randomised controlled trials (including multisite studies) and long-term follow ups are needed.

Implications for Education

Nurses working with home-based nursing health promotions need formal training in gerontology. Nurses should be provided with tailored education focusing on responding to client specific concerns, physiological components of cardiovascular disease and pharmacology prior further investigations of nurse-led clinics.

Implications for Policy

Policy makers should acknowledge the paucity of robust research evidence that can be used to inform managerial decisions about how best to run the nursing service. The consequence is that policy recommendations should be linked to appropriate evaluation. Research policy priorities should be identified as soon as possible and supported within programmatic research activity.

Policy makers should consider midwife-led models of care, to achieve clinically important improvements in maternity care. But considerations are needed around how financing of midwife-led services can be reviewed to support this.

Education and Continuing Professional Development

Despite the significant investment in all types of simulated learning environments in nursing and other healthcare education areas, there is little robust evidence to demonstrate its effectiveness as a learning intervention. The research that has been undertaken is characterised as being small in terms of numbers of participants and non-representative.

The evidence regarding the effectiveness and appropriateness of undergraduate nursing curricula is notably weak because of the paucity of high quality comparative studies and meaningful outcome measures of available studies. Therefore, no strong conclusions can be made regarding the effectiveness and appropriateness of undergraduate nursing curricula.

There is some low-level evidence to suggest that some concepts of nursing curricula (e.g. ageing concepts, liberal education) can be effectively integrated into the curriculum, and most technical components such as physical assessment can be best presented in the subject-centred model.

Staff responsible for developing IPE should not assume groups of learners with, for example, similar professional backgrounds, will respond to IPE in the same way. It has been suggested that authenticity is a mechanism that enhances the effectiveness of IPE through the diverse ways of delivering the curriculum. Similarly, the customisation of IPE so that it reflects the reality of practice for specific groups of inter-professional learners acts as a mechanism for positive outcomes.

Details of the student numbers and professional mix within a cohort of inter professional learners and the influence of these on the outcomes of the IPE would further understanding of the management of this complex genre of professional education.

Funded evaluations are necessary and likely to lead to more evidence that is robust and addresses key unanswered questions about the impact of IPE. Staff should seek funding for robust evaluations of IPE especially for that delivered in real and simulated practice settings and to measure its impact on attitudes and behaviour.

Professional development programs need to be structured to address specific areas of understanding and incorporate adult learning needs. Those courses which focus on ‘problem’ areas without addressing the nursing environment have limited efficacy.

Longer term interventions with booster or refresher sessions may have a more sustained positive effect.

Implications for Practice

Staff development in the facilitation of IPE is essential to its effectiveness. Teachers need to be aware that learner reactions to IPE are related to multiple factors. Learning about being inter professional in a context that reflects students' current or future practice is important for effective learning.

Organisations need to take on the responsibility of delivering CPD programs which enable nurses to develop their skills more effectively – not just reacting to organisational problems (e.g. high turnover/burnout) but working proactively with nurses to improve patient outcomes which are being affected.

Implications for Research

Research into the effectiveness of different clinical placement approaches is urgently needed.

Further studies are needed which compare actual assessments of students' performance post-education, either using OSCEs or expert reassessment of simulation events. Additional well-designed studies are needed to quantify simulation education outcomes.

There is a need for a systematic and rigorous program of research to examine the effectiveness of different nursing curriculum models. Further research is required to examine the relationships of patient care outcomes and effectiveness of undergraduate nursing curricula.

Future randomised controlled studies explicitly focused on IPE with rigorous randomisation procedures and allocation concealment, larger sample sizes, and more appropriate control groups, would improve the evidence base of IPE. A focus on understanding the use of IPE in relation to resources is also needed. These studies should also include data collection strategies that provide insight into how IPE affects changes in healthcare processes and patient outcomes, as research to date has not sufficiently addressed this critical issue.

More evaluations of IPE in real and simulated practice settings are needed to strengthen our knowledge of mechanisms that lead to positive behaviour changes and patient/client care and service delivery improvements.

Nurse/Midwife-Patient Relationship

Institutions need to design ward structures (ward culture and nurses workload) that support and/or encourage nurses to be person-oriented. Culture and post basic communication skills are also important aspects to consider. These recommendations reflect the link between the context in which nurses and patient interact both in terms of culture and resources as well as the need to ensure relevant skills and competencies.(68)

Haesler et al (2006) concluded that the incorporation of staff and family education into interventions designed to promote constructive staff–family relationships is highly recommended.(69) Education should include relationship development, power and control issues, communication skills and negotiating techniques. Support from administration and management staff is more likely to result in sustained positive effects from interventions designed to promote constructive interactions between staff and families. Support should address workloads and staffing issues. Staff characteristics most important to the development of constructive relationships include open and honest communication, working in partnership, providing information and promoting the uniqueness of the patient.

Since nurses play an active role in patient care throughout the care continuum, work to identify nurses' impact in all care settings should be a priority area for future research. Further research is needed to strengthen the evidence base for performance measures that

are sensitive to the role of all team members. Identification of discipline-sensitive outcomes could also contribute to better understanding by the inter-professional team members of each other's role and, thus, contribute to more collaborative, supported patient-centred care.

It was discovered that the definitions used to measure the outcomes varied between studies. This is an important limitation of NSPOs and creates significant challenges for researchers, managers and front-line nurses who want to understand the meaning of their results by comparing them across organisations and settings. An additional challenge in consistency of measures is the lack of data sources to collect and access nursing sensitive patient outcomes.

Implications for Practice

Staffs needs to acknowledge the impact the wider environment (context) has on their ability to communicate effectively with patients and relatives.

Incorporation of staff and family education into interventions designed to promote constructive staff–family relationships is highly recommended in the area of cancer care.

Nurses in practice should be able to use a set of nursing sensitive patient outcome measures.

Implications for Research

Further research into the Fundamentals of Care and the unique role of nurses in improving patient outcomes in these areas is needed.

More in depth investigation of the effects of nurses' communication styles on patient outcomes is required.

Research that investigates the impact of organisational culture and national culture on effective communication between nurses and patients in a range of clinical and care settings should be conducted.

There is a need to develop NSPOs for major contexts (hospital, community, aged care) to better enable the assessment of patient outcomes and thereby improve these outcomes.

Implications for Education

There is a need to explore how patient centred communication skills are taught in the undergraduate and postgraduate nursing curricula. Education should include relationship development, power and control issues, communication skills and negotiating techniques.

Implications for Policy

Agreement of the Fundamentals of Care and how they are taught, delivered and evaluated is an important area of policy development.

The use of specific, reliable and valid, measures for NSPOs should be mandated so that consistent research moves us forward in these areas. This may require the development of appropriate policy frameworks to achieve this across the Australian health care system.

Limitations

Although a systematic review is intended to identify all the best available evidence this ideal is rarely achieved. Constraints are often encountered in terms of the scope of the review and the resources and time available to conduct the review. The review question for this project was necessarily broad, addressing factors that could impact on the quality of care provided by nurses/midwives. The initial scoping search of the literature revealed tens of thousands of

primary research studies that could potentially address the topic. It was also apparent that there were a reasonably large number of systematic reviews also that addressed the topic. Two important decisions were made in defining the scope of the review. The first was that we would consider both qualitative and quantitative evidence. The second was that we would only include systematic reviews. This was a pragmatic decision because to include primary research would not have been feasible if we were to still meet the purpose of the review. As a result we have a large body of evidence to inform our review question/s but this does not include **all** the best available evidence. This is the compromise when conducting an umbrella review. There are factors that impact on the quality of nursing care that are not addressed by the identified systematic reviews and this therefore is the most significant limitation of this review.

CONCLUSIONS

This umbrella review, supported by a group of nurse leaders in Australia, aimed to identify those elements known to support a high quality workforce by drawing on the best available Australian and international evidence. The findings provided recommendations that relate to practice, research, education and policy initiatives to help shape the future nursing workforce in Australia and internationally.

The overall findings and key recommendations for each of the review questions are as follow (links to the relevant sections are provided in relation to the evidence for each recommendation):

1. **What factors related to the *context of care* influence the nurse's and midwife's ability to provide quality patient-centred care?**

   Context is defined as all the elements that make up the environment where patient care is delivered. The review identified several factors in relation to context that impact on the nurse's and midwife's ability to provide quality patient-centred care. These factors include leadership, inter-professional practice, autonomy, teamwork, support systems and structures, evidence-based practice, appropriate staffing levels, and cultural competence. This composition of factors has been described in the international literature as a Positive Practice Environment. These factors directly influence the environment in which nurses provide care and as a consequence impact on recruitment and retention rates, but more importantly upon nurses' wellbeing and ultimately patient outcomes.

   Key recommendations based on the evidence from the included reviews:

   - Nurse leaders in Australia need to identify the elements of the positive practice environment which need immediate attention in order to improve recruitment and retention rates and patient care. (Refer to Positive Practice Environment)
   - Strategies at national, state and organisational level to improve recruitment and retention rates must be based on plans to develop positive practice environments in all healthcare settings. (Refer to Positive Practice Environment)
   - The current professional nursing workforce must be developed through education and professional development activities, which prioritise leadership, cultural competence and inter-professional teamwork. (Refer to Leadership, Cultural Diversity, Inter-Professional Practice)
   - Nurses must have the authority to make decisions relating to the delivery of care at every level of the healthcare system. (19Refer to Autonomy of Practice)
   - System-wide structures and support for evidence based practice must be implemented. (Refer to Support Systems and Structures)
   - Further research is required to identify the evidence base for specific teamwork practices within nursing and with other health disciplines. (Refer to Working in teams)
   - Further research is required to understand the elements of the positive practice environment for Aboriginal and Torres Strait Islander patients and nurses. (Refer to Cultural Diversity)

2. **What factors related to the way nursing and midwifery *is organised* influence the nurse's and midwife's ability to provide quality patient-centred care?**

   When considering resources, there is no doubt the evidence supports a clinical and statistical association between increased RN staffing and improved patient outcomes. There is also good evidence that increased ratios of RNs compared to less qualified staff leads to shorter stays in hospital and decreased adverse events. Evidence indicates self scheduling of rosters may decrease staff turnover. The optimal duration of shift length was examined and shift lengths of over 12 hours are associated with increased errors but shift length generally does not appear to be related to the quality of patient care, stress and job satisfaction.

   Nurse-led care was supported for some conditions including hypertension and cardiovascular disease. Evidence examining midwife led care demonstrates improved patient outcomes. Nursing and midwifery generate greater patient compliance with treatment recommendations, greater patient satisfaction and resolution of pathological conditions compared to standard care (in these cases care delivered by medical practitioners).

   Key recommendations based on the evidence from the included reviews:

   - In developing workforce strategies, planners must take account of the decrease in quality of patient care that is directly associated with the substitution of registered nurses in the acute care setting. (Refer to Staffing)
   - Research is required to determine optimal staffing levels and skill mix and the relationship between these and the quality of patient care across all care settings. (Refer to Skill mix)
   - Models of care including team midwifery, nurse-led and midwife-led care should be actively supported and incorporated into evolving models of care delivery. (Refer to Primary Nursing Care and Team Models of Care)
   - Nationally consistent nursing sensitive patient outcome measures must be developed to evaluate the contribution of nursing care to patient outcomes. (Refer to Staffing)
   - The cost effectiveness of nursing, including emerging roles, nurse practitioners and nurse midwives requires further research. (Refer to Emerging roles, Nurse Practitioners/Nurse Midwives)
   - Research is required to investigate the association between shift length and the quality of patient outcomes and the impact on nurses. (Refer to Rostering)
   - Further research is required to identify appropriate patient populations who would benefit most from nurse-led units. Admission criteria for the selection of individual patients into nurse-led units also needs to be clarified. (Refer to Nurse/Midwife-led care)
   - Further research is required to discover how nurses best implement practice guidelines. (Refer to Guidelines for practice)

3. **What factors related to *educational preparation* influence the nurses' and midwifes' ability to provide quality patient-centred care?**
   AND
4. **What factors related to the *career opportunities and continuing professional development (CPD) opportunities* influence the nurse's and midwife's ability to provide quality patient-centred care?**

   There was a paucity of reviews covering undergraduate preparation (question 3) and the impact of continuing professional development on nursing and midwifery competence (question 4).

Educational programs (simulations and the different type of curricula) need to measure the effect of their interventions on the student's ability to actually implement skills and knowledge after they have finished their program of study. Simulations have the potential to increase student confidence in their own abilities and enable them to work on skills within a range of contexts. Simulation has the potential to be useful for skill development at least in the short term. There were no reviews of the effect of different approaches to managing undergraduate nursing students' clinical placement experiences.

Reviews covering the impact of CPD programs on qualified nursing and midwifery skills and knowledge were sparse. For those that were included, it was clear that CPD programs need to be structured to address specific areas of understanding and incorporate adult learning needs.

Key recommendations based on the evidence from the included reviews:

- Research is urgently required to review clinical placement approaches for undergraduate nursing students. (Refer to Education Curriculum)
- Simulation as a concept needs to be clearly defined and the goals of using such learning processes need to be explicitly stated and measured. (Refer to Simulated Learning)
- The differences between nursing curricula need to be clear and the outcomes of these different approaches evaluated in relation to their effect on student learning and patient care. (Refer to Education Curriculum)
- Research is required on inter-professional education which investigates the effects of cohort characteristics (such as student numbers and professional mix) on learning outcomes. (Refer to Inter-Professional Education (IPE))
- Professional development programs require greater focus on work based problem solving and more effective ways of evaluating the programs impact. (Refer to Continuing Professional Development)
- Organisations must deliver CPD programs which enable nurses to create and maintain a positive practice environment and work proactively with nurses to improve patient outcomes. (Refer to Continuing Professional Development)

5. What factors related to the *way nurses, midwives and patients interact in the direct care encounter* influence the nurse's and midwife's ability to provide quality patient-centred care?

Few systematic reviews relating to how nurses and patients effectively interacted to promote patient-centred care were identified. A patient-centred care approach supports involvement of patients in their basic care needs (termed the Fundamentals of Care) and in the decision-making procedure. Only one review that related to patients' fundamental care needs was identified. This care need was communication.

Other reviews that explored nurse-patient interactions were linked to the development and use of NSPOs (outcomes significantly impacted by nursing care) to evaluate patient-centred care. Nursing Sensitive Patient Outcomes have been discussed under question 2 but those reviews identified under this question specifically address the patient's perspective.

The findings from these reviews indicate that there is a complex interplay of interpersonal factors between nurses and patients (and their families) which impact upon the efficacy of communication. Furthermore this relationship is also influenced by the organisation and context in which the relationship develops. Organisational structure and the relationships between staff play an important role in either facilitating or creating barriers

to relationships between staff and patients. This review demonstrates the lack of attention being paid to other fundamental aspects of patient care (such as meeting patients' needs for dignity, respect, comfort, safety, pain management, and other basic or fundamental needs). This deficit in the literature may also reflect why it continues to be a challenge to develop robust sets of nursing sensitive patient outcome measures.

Key recommendations based on the evidence from the included reviews:

- Research is required to investigate the effect of nurses' communication styles on patient outcomes in terms of patient-centred care. (Refer to Fundamentals of Care)
- Evaluation of how patient centred communication skills are taught in the undergraduate and postgraduate nursing curricula should occur. (Refer to Fundamentals of Care)
- Further research into the Fundamentals of Care and the nurse's role in improving patient outcomes in these areas is urgently required. (Refer to Fundamentals of Care)
- Nationally consistent Nursing Sensitive Patient Outcome measures must be developed to evaluate the contribution of nursing care to patient outcomes. (Refer to Nursing Sensitive Patient Outcomes , Staffing)

The purpose of this umbrella review was to identify the evidence base for factors that would contribute to building the future nursing workforce in Australia. We found strong evidence indicating if the context where nurses and midwives work is conducive, then the results will be good for patients and good for nurses and midwives. We also found compelling evidence for building the future nursing workforce around the RN role. This was demonstrated in terms of improved patient safety, quality of care and patient outcomes.

The review identified the following areas for immediate action and reform:

Autonomy of practice; adequate educational preparation of the nursing workforce, support for nurses both in terms of personnel and infrastructure support and the development and standardisation of Nursing Sensitive Patient Outcomes. The development of standardised metrics must be embraced as a national priority as it will then enable health policy makers and economists to more clearly identify cost effective interventions and strategies.

There is a compelling case for further investment in rigorous evaluation of nursing educational programs at undergraduate level and for continuing professional development initiatives. Central to this is the evaluation of clinical simulation approaches, different curriculum designs and testing the effectiveness of interdisciplinary education approaches.

Finally, perhaps the most surprising finding was where the gaps in the existing evidence resided. From an Australian perspective, it was noteworthy that no reviews were identified that looked at Aboriginal and Torres Strait Islander peoples' experiences of healthcare nor was there any reference made to particular issues around cultural safety/competence. The second significant gap was in the evidence base around the Fundamentals of Care. This is noteworthy given the universal prevalence of such needs as hygiene, safety, mobility, dignity, and pain relief and yet there is very little evidence to help practitioners undertake these activities or measure their effect in a consistent way.

Given the gaps in our knowledge base, it is not surprising that our policy approach to recruitment and retention still has a way to go.

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APPENDICES

Appendix I: Expert reference group
Appendix II: Critical appraisal tool
Appendix III: Data extraction tool
Appendix IV: Included systematic reviews
Appendix V: Excluded systematic reviews

APPENDIX I: EXPERT REFERENCE GROUP

Participants

Amanda Adrian

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APPENDIX II: CRITICAL APPRAISAL TOOL

JBI Critical Appraisal Checklist for Systematic Reviews

Reviewer _____ Date _____

Author _____ Year _____ Record Number _____

	Yes	No	Unclear
1. Is the review question clearly and explicitly stated?	☐	☐	☐
2. Was the search strategy appropriate?	☐	☐	☐
3. Were the sources of studies adequate?	☐	☐	☐
4. Were the inclusion criteria appropriate for the review question?	☐	☐	☐
5. Were the criteria for appraising studies appropriate?	☐	☐	☐
6. Was critical appraisal conducted by two or more reviewers independently?	☐	☐	☐
7. Were there methods used to minimise error in data extraction?	☐	☐	☐
8. Were the methods used to combine studies appropriate?	☐	☐	☐
9. Were the recommendations supported by the reported data?	☐	☐	☐
10. Were the specific directives for new research appropriate?	☐	☐	☐

Overall appraisal: Include ☐ Exclude ☐ Seek further info. ☐

Comments (Including reasons for exclusion)

APPENDIX III: DATA EXTRACTION TOOL

Data Extraction Tool

Data Extraction Tool for Systematic Reviews/ School of Nursing, University of Adelaide, Australia

Reviewer Date

Bibliographic data

Author ..... Year .....

Journal ..... Title .....

Objective (category) Context (wider) Education/ Preparation Organisation of Nurses Patient-centred care

Population RN only Midwives only Advanced nursing roles Other (ex. educators)

RN + Specify: .....

Setting **A.** Geographical (ex. US) .....

B. Place (ex. hospital) .....

C. Clinical specialty (ex. mental health) .....

Included Studies (n) .....

What has been examined/ tested in this review?

.....

What were the findings? Quantitative – dichotomous data, continuous data Qualitative - textually

.....

Recommendations for practice/policy/education

.....

Recommendations for research

.....

Comments

APPENDIX IV: INCLUDED SYSTEMATIC REVIEWS

Included Studies Table

Included studies are listed alphabetically and grouped by theme.

CONTEXT Background: A= Geographical, B=Setting, C=Clinical specialty. N=number of included studies.

Author/s	Background	Main findings
Comondore et al. (2009).(35)	Population: Aged care residents A. USA (mainly), Canada, Australia B. For profit and non-for-profit nursing homes C. Long term care N=82 Aim: To compare quality of care in for-profit (FP) and non-for-profit (NFP) (privately and publicly owned) nursing homes	Forty studies favoured not-for-profit facilities and three studies favoured for-profit facilities. The remaining studies had less consistent findings. Meta-analyses suggested that not-for-profit facilities delivered higher quality of care than did for-profit facilities for two of the four most frequently reported quality measures: more or higher quality staffing (ratio of effect 1.11, 95% CI 1.07to 1.14, p<0.001) and lower pressure ulcer prevalence (odds ratio 0.91, 95% CI 0.83 to 0.98, p=0.02). Non-significant results favouring not-for-profit homes were found for the two other most frequently used measures: physical restraint use (odds ratio 0.93, 95% CI 0.82 to 1.05, p=0.25) and fewer deficiencies in governmental regulatory assessments (ratio of effect 0.90, 95% CI 0.78 to 1.04, p=0.17). Most studies suggest a trend towards higher quality care in not-for-profit facilities than in for-profit homes, but a large proportion of studies show no significant trend.
Flodgren et al. (2012).(28)	Population: RNs, midwives, patients A. US B. Hospital C. Medical – surgical care N=1 Aim: To assess the effectiveness of organisational infrastructures in promoting evidence-based nursing.	One study from the USA (re-analysed as an intermittent time series) involving one hospital and an unknown number of nurses and patients were included. The study evaluated the effects of a standardised evidence-based nursing procedure on nursing care for patients at risk of developing healthcare-acquired pressure ulcers (HAPUs). If a patient's admission Braden score was below or equal to 18 (i.e. indicating a high risk of developing pressure ulcers), nurses were authorised to initiate a pressure ulcer prevention bundle (i.e. a set of evidence-based clinical interventions) without waiting for a physician order. Re-analysis of data as a time series showed that against a background trend of decreasing HAPU rates, if that trend was assumed to be real, there was no evidence of an intervention effect at three months (mean rate per quarter 0.7%; 95% confidence interval (CI) 1.7 to 3.3; P = 0.457). Given the small percentages post intervention it was not statistically possible to extrapolate effects beyond three months.

Author/s	Background	Main findings
Gi et al. (2011).(33)	Population: RNs A. USA, Canada, Australia B. Inpatient and outpatient units/wards and bone marrow transplant unit C. Oncology (adult, paediatric) N=7 Aim: Relationship between nursing shortage and nurses' job satisfaction, stress burnout levels in oncology/ haematology settings.	Organisations need to explore strategies that aid in retention of nurses. Organisations should target inpatient settings to explore reasons for staff shortage and negative nursing outcomes. They can also replicate features of other organisations that are attractive to oncology nurses. Organisations should put in place programs that assist oncology registered nurses in coping with job dissatisfaction and burnout.
Kazanjian et al. (2005).(25)	Population: RNs, Physicians A. USA, Australia, Canada, UK, Switzerland B. Hospitals C. Intensive care, acute care, medical + others not specified N=27 Aim: Effect of hospital nursing environment (organisational features that undermine or facilitate nurses' professional autonomy) on patient outcomes/quality of care.	Autonomy: Three studies found an association between nursing autonomy and lower pt mortality, another two studies found no difference. Workload: Eight studies found correlation between workload and mortality but five found higher mortality with higher workload and three found lower mortality with higher workload. Two studies found no correlation. Inter-professionalism: Six studies found significant positive association between nurse-physician relationships and patient mortality, three studies found no differences. The two most rigorous studies produced contradictory results. Nurse management: Four studies found lower mortality with many different nurse management attributes, one study found no impact. Nursing standards: All three studies found significant positive correlation but many case-mix/validity criteria were not met. Professional development (PD): Three studies found significant negative correlation between nursing PD and patient mortality. One study found no significant association but had case-mix/validity issues. Mediating: Results showed lower mortality with nurse-mediating processes.
Medves et al. (2009).(29)	Population: RNs (only interdisciplinary studies were included) A. USA, UK, Canada, Australia + others	Ten dissemination and implementation strategies identified, most common strategy was distribution of educational materials and the least common being mass media information. Professional dissemination and implementation

Author/s	Background	Main findings
	not specified B. Not specified C. Variety of areas N=88 Aim: Dissemination and implementation strategies of clinical guidelines related to interdisciplinary team practice.	1. Distribution of educational materials Sixty of 88 studies used distribution of educational materials. Of these 60, 44 (73.3%) reported significant findings, although it is not possible to determine that distribution of educational materials was directly responsible for the significant findings. 2. Educational meetings Sixty-three studies used educational meetings. Of these 63, 47 (74.6%) reported significant findings, although it is not possible to determine that educational meetings were directly responsible for the significant findings. 3. Local consensus process Thirty-five studies used local consensus processes to disseminate and implement practice guidelines. Of these 35, 23 (65.7%) reported significant findings, although it is not possible to determine that local consensus processes were directly responsible for the significant findings. 4. Educational outreach visits Only 12 of 88 studies utilised educational outreach visits as part of their strategy, and 8 (66.6%) reported significant findings although it is not possible to determine that these visits were directly responsible for the significant findings. 5. Local opinion leaders Input from local opinion leaders was described in 16 of 88 studies, with 13 (81.3%) having significant findings. While this is encouraging, it is not possible to determine that these opinion leaders based locally were directly responsible for the significant findings. Utilisation of a leader who has change management skills was highlighted as contributing to success in implementing nutritional support for stroke patients. 6. Patient mediated Patient mediated input was described in 14 of 88 studies, with 9 (64.3%) reporting significant findings. Although it is not possible to determine that patient mediated input was directly responsible for the significant findings. 7. Audit and feedback Audit and feedback were the third most often cited professional strategy for dissemination and implementation in 46 of the 88 studies, and 38 (82.6%) reported significant findings. It is not possible to attribute that the audit and feedback was the factor that was directly responsible for the significant findings. 8. Reminders

Author/s	Background	Main findings
		Reminders to health care professionals were described in 28 of 88 studies and 24 (85.7%) of these studies reported significant findings. It is not possible to report that reminders to providers directly account for the significant findings. 9. Marketing Marketing techniques were utilised by 18 of 88 studies and in 14 (77.7%) of papers there were significant findings, and included focus groups. However, these results cannot be directly attributed to marketing. 10. Mass media One study utilised newsletters and conference calls to all health care providers of the program at all sites to provide information and updates. While some of these methods could also be attributed to audit and feedback, the study used newsletters a priori to get general information disseminated to all sites. Overall, utilising multiple approaches to dissemination and implementation seems to be useful when working with teams, with distribution of educational materials, educational meetings, and audit and feedback being the most commonly used strategies. Of the studies that used local opinion leaders, audit and feedback and reminders, these had in excess of 80% significant findings. Outcomes Change in Knowledge Assessment of knowledge of the practitioners was reported in 37 of studies, of which 12 were deemed to be significant. Change in Practice Only Three studies demonstrated a change in practice. Significance was not provided. Change in Economic Outcomes Twelve studies considered economic outcomes. Of these 6 reported significant findings.
Pearson et al. (2006b).(19)	Population: Nurses, interdisciplinary team members A. England, USA, Australia, Israel, Finland, Ireland B. Hospitals, medical centre, general practices C. Medical, surgical, primary care,	Characteristics: A total of five findings grouped into three categories demonstrated that nursing teams exhibit accountability for their actions, commitment to the nursing team and an enthusiastic, motivating attitude. Impact of teams: Patient satisfaction and waiting list periods were two of the most common outcomes. To ensure nursing teams are impacting on the delivery of high-quality nursing care, additional patient, nurse and organisational outcomes should be considered. Nursing teams need to establish a balance between practice development and the delivery of high-

Author/s	Background	Main findings
	midwife care, intensive care unit, orthopaedic N=24 Aim: To identify the relationships between: - The processes of a nursing team and the creation of a healthy work environment; -The characteristics (specifically, but not limited to, communication, coordination and collaboration) of a nursing team and the creation of a healthy work environment; and -The structure and composition of a nursing team and the creation of a healthy work environment.	quality care. Structure: Through establishing a collaborative working structure within a team, service delivery to patients and their communities could improve. A separate category derived from the data showed that members of a nursing team perceived management structure to be hierarchical - the impact of this not evaluated. Team processes: Communication was viewed as an essential component to produce effective teamwork - by establishing clear processes for communication teamwork could be improved. Teamwork improved when staff members were involved in the development and implementation of unit polices. Clear team processes were needed because of variability in team decision-making processes. Staff members were more satisfied when the team established a clear process that promoted continuity of care. Primary nursing was evaluated in a number of studies; however, there were limited statistical benefits to patient outcomes in the implementation of this type of nursing. The results related to team nursing are not conclusive. The use of an interdisciplinary team structure for the delivery of healthcare showed a variety of benefits e.g. produced higher staff and patient satisfaction levels. Overall, results indicated that team characteristics should include accountability, commitment, enthusiasm and motivation. Social support from a supervisor or colleague increased satisfaction levels of staff; Reducing conflict can improve satisfaction levels, team performance and anticipated turnover of staff. Overall, results indicated that team characteristics should include accountability.
Pearson et al. (2007a).(17)	Population: Nurses A. Canada, Netherlands + others not specified B. Hospitals, medical centre, + others not specified C. Intensive care units, acute care, psychiatry, mental health + others not specified N=44 Aim: Leadership attributes that foster and produce healthy outcomes for patients	The results suggest there is no one particular style or 'attribute' of a leader that can definitively create a positive healthy work environment. A wide selection of leadership styles was examined and included such styles as social, transactional, transformational, instrumental, participatory and consultative. Satisfaction being the most common variable measured. Social and transformational leadership were found to be positively associated with job satisfaction whereas transformational and transactional leadership styles were found to be positively associated with patient satisfaction. Of the papers reviewed four types of leadership styles were found to be positively associated with a patient's quality of life: transformational, transactional, consultative and participatory. Leaders that used a participatory leadership style were also associated with lower staff turnover. Reporting of fewer health complaints by patients was associated with social leadership style as well as an instrumental leadership style. Transformational

Author/s	Background	Main findings
	and staff as well as for the organisation	leadership was associated with the highest number of positive outcomes: unit effectiveness, extra effort from staff and a positive organisational culture as well as those listed earlier. A significant number of papers also examined different behaviours and characteristics of leaders rather than the particular leadership style itself. Results demonstrated that there are many different behaviours and characteristics of a leader that result in positive outcomes. Flexibility, trust, respect, support, consideration and motivation are some of the characteristics of a leader that can result in positive outcomes and therefore a healthier work environment. Leaders who appeared to be effective in creating a healthy work environment were knowledgeable and educated as well as supportive and encouraging towards professional growth in their staff. Multiprofessional collaboration was also seen to be an important aspect of the leadership role. Communication is a recurrent theme among the papers; leaders who communicated effectively and involved their staff in the decision-making process were seen as being involved in creating a healthy work environment. Results suggest that a positive relationship between empowerment and specific staff outcomes exists. Staff satisfaction is a predominant variable measured in many of these studies but there also appears to be a relationship between work effectiveness, employee accountability and organisational commitment. Although these findings do not predict causation (meaning access to empowerment causes increased job satisfaction and work effectiveness, etc.), these findings could be useful for organisations and their leaders.
Pearson et al. (2007b).(20)	Population: Patients A. Not specified B. Not specified C. Not specified N=19 Aim: Identified the best available evidence on the relationship of organisational structures and processes that support the development of effective culturally competent practices and a healthy work environment.	'If organizations work collaboratively with each other, this will improve services for culturally diverse populations' (Level of evidence M3) 'Embedding cultural competence processes and practices within organisational structures will promote the delivery of culturally competent care'(Level of evidence M3) 'Embedding ongoing education and training in the area of cultural competence in organisational processes will increase the cultural competence of staff' (Level of evidence M3) 'Healthcare information offered to patients should be easily accessible and culturally relevant' (Level of evidence M3) 'Health care providers require a particular skill set to deliver culturally competent care' (Level of evidence M3) 'The need for organisations to develop system approaches to ensure culturally competent care can be delivered and provide a supportive environment to foster cultural competency'

Author/s	Background	Main findings
		(Level of evidence M3) 'Recruiting and retaining staff to achieve diversity in the workforce can benefit not only the healthcare professional in the delivery of culturally competent care but also ethnic minority groups in the care they access and receive' (Level of evidence M3)
Poissant et al. (2005).(30)	Population: Physicians, nurses A. Not specified B. Not specified C. Not specified N=23 Aim: Impact of electronic health records (EHRs) on documentation time of physicians and nurses and to identify factors that may explain efficiency differences across studies	The use of bedside terminals and central station desktops saved nurses, respectively, 24.5% and 23.5% of their overall time spent documenting during a shift. Using bedside or point-of-care systems increased documentation time of physicians by 17.5%. The use of central station desktops for computerized provider order entry was found to be inefficient, increasing the work time from 98.1% to 328.6% of physician's time per working shift (weighted average of computerized provider order entry oriented studies, 238.4%). Studies that conducted their evaluation process relatively soon after implementation of the electronic health record tended to demonstrate a reduction in documentation time in comparison to the increases observed with those that had a longer time period between implementation and the evaluation process. This review highlighted that a goal of decreased documentation time in an electronic health record project is not likely to be realised. It also identified how the selection of bedside or central station desktop electronic health records may influence documentation time for the two main user groups, physicians and nurses.
Randell et al. (2007).(32)	Population: Nurses A. Not specified B. Not specified C. Not specified N=8 Aim: Studies, which assessed the effects of CDSS (computerized decision support system) use by nurses in a clinical setting on measurable professional performance and/or patient outcomes	The effect of computerised decision support system on nursing performance and patient outcomes was inconsistent.
Rittenmeyer & Huffman (2009).(26)	Population: "Professional Nurses" A. Australia, Uganda, Sweden, Tanzania, Hong Kong, Canada, Ireland	Human Reactivity: Nurses who experience moral distress respond with a myriad of biological, psychological and stress reactions. Institutional Culpability: Moral distress is experienced when nurses feel the need to

Author/s	Background	Main findings
	+ others not specified B. Hospitals, cancer clinical trial units, hospice + others not specified C. Age care, mental health, medical, surgical, critical care, paediatric, oncology, HIV/AIDS care, long term care + others not specified N=39 Aim: How professional nurses working in hospital environments experience ethical/moral distress.	advocate for patients well-being, while coping with institutional constraints. Patient pain and suffering: The perception of patient pain and suffering as a result of medical decisions, of which the nurse has little power to influence contribute, to the experience. Unequal Power Hierarchies: Unequal power structures, prevalent in institutions, exacerbate the problem.
Salmond et al. (2009).(16)	Population: Nurses A. Not specified B. Hospitals C. Not specified N=17 Aim: The impact of Magnet designation on patient and nurse outcomes. 1. What impact/influence does Magnet designation have on organisational outcomes including but not limited to organisational climate or the professional nurse work environment? 2. What impact/influence does Magnet designation have on nursing outcomes	There is strong evidence to support the positive effect of Magnet designation on the professional nursing practice environment and good evidence that Magnet designation is associated with lower levels of emotional exhaustion, higher job satisfaction and higher intent to stay. The level of evidence for these studies is Level 3 (JBI Level of Evidence for Effectiveness Studies). The investigators conclude that there is strong support (Grade A Recommendation) that merits organisations undertaking efforts to advance the professional nursing practice environment. There is a need to further investigate the linkage between professional nursing practice environment and/or Magnet designation with patient outcomes. The two studies used in the review are at the Effectiveness-3 level. One found no link between Magnet status and patient outcomes but suggested a possible link with the professional nursing practice environment. The other study found that patients cared for in Magnet hospitals had fewer decubitus ulcers, a nurse-sensitive patient outcome. This is a complex relationship that requires studies to go beyond univariate analysis and account for

Author/s	Background	Main findings
	including but not limited to nursing satisfaction, recruitment and retention in acute care hospitals for the registered nurse? 3. What impact/influence does Magnet designation have on patient outcomes including nurse-sensitive patient outcomes in acute care hospitals? 4. Does the economic investment for Magnet designation support the outcomes?	patient and organisational covariants. There is a dearth of economic studies. Although one can postulate that there is cost savings associated with decreased turnover and replacement costs and with fewer decubitus ulcers, there is no empirical data. Research linking the impact of the high PNPE with cost outcomes is needed.
Timmermans et al. (2012).(23)	Population: multidisciplinary and nursing teams A. Not specified B. Hospitals C. Mental health, cardiac surgery + others not specified N=8 Aim: 1. relation between team learning and implementation of innovations in nursing 2. determine whether individual and contextual characteristics contribute to/obstruct team learning in nursing teams	Team learning includes processes to gather, process and store information from different innovations within the nursing team. Prevalence of team learning activities improved or minimised by individual and contextual factors. Individual factors include: positive attitude; collaborative learning; positive appreciation of team work; focus on continuous improvement; positive experience of previous education; empowerment. Contextual factors include: team based learning infrastructure; facilitating leadership; hierarchical leadership (negative); shared vision/goals; external focus; collegial support; time to learn; psychological safety; crossing borders; identifying learning needs; centralist structure (negative); team stability; large team (negative). Caution is required as the primary studies were of poor methodology.

Author/s	Background	Main findings
Urquhart et al. (2009).(31)	Population: RNs, midwives, physicians, patients A. Germany, Netherlands, USA, UK, Denmark, Canada, B. Hospital, health centre, C. medical-surgical ICU, psychiatry, medicine (gastro, endocrine, lung disease), paediatric. N=9 Aim: The impact of nursing record systems on nursing practice and patient outcomes.	Nursing record systems designed for discrete problems are effective e.g. pain management in children; empowering pregnant women and parents; reducing loss of notes; reducing time spend on data entry for test results; reducing transcription errors; reducing volume of papers in a record. No evidence of any measurable difference in practice outcomes between use of one kind of nursing record system over another. Studies looking at whole nursing record systems less clear. No evidence to support changing an entire system improves patient outcome. Structured records better than unstructured. Computer based records take more time and don't necessarily improve patient outcomes. In specific areas/topic multidisciplinary records are more effective (paediatrics).
Wong & Cummings (2007).(24)	Population: RNs A. US, Canada B. Acute hospitals, nursing homes, ICU, community hospitals, teaching and non-teaching hospitals, long term, inpatient units C. Acute care, age care N=7 Aim: Relationship between nursing leadership and patient outcomes	Evidence of significant association between positive leadership behaviours, styles or practices and increased patient satisfaction and reduced adverse events were found. Findings related to patient mortality rates were inconclusive. Emphasis on developing transformational nursing leadership is an important organisational strategy to improve patient outcomes. Discussion – nursing leadership is essential to the creation of practice environments, with appropriate staffing levels, that support nurses in preventing unnecessary deaths.
Zwarenstein et al. (2009).(27)	Population: Inter-professional teams, particularly doctors and nurses. Patients. A. Not specified B. Acute care hospital, nursing homes	One study on daily interdisciplinary rounds in inpatient medical wards at an acute care hospital showed a positive impact on the length of stay and total charges. Another study on daily interdisciplinary rounds in a community hospital telemetry ward found no impact on length of stay. Interdisciplinary meetings (multidisciplinary team meetings). Monthly multidisciplinary team meetings improved prescribing of psychotropic drugs in nursing homes.

Author/s	Background	Main findings
	C. Surgery, medicine, nephrology, cardiology N=5 Aim: The effectiveness of three types of interventions to improve inter-professional collaboration were studied: 1. inter-professional rounds 2. inter-professional meetings 3. externally facilitated inter-professional audit	Videoconferencing compared to audio conferencing MDT case conferences showed mixed results – decreased number of case conferences per patient and shorter length of stay but no difference in occasions of service or length of conference. No difference between the number of communications between health professionals recorded in the notes. Inter-professional audits externally facilitated (multidisciplinary audits with an external facilitator). This was associated with increased audit activity and reported improvements in care.

ORGANISATION Background: A= Geographical, B=Setting, C=Clinical specialty. N=number of included studies.

Author/s	Background	Main findings
Brown & Grimes (1995).(54)	Population: Nurse practitioner, nurse midwives, physicians A. US and Canada B. Community-based, hospital-based ambulatory care settings, birthing centres C. Mainly internal medicine, general/family practice, and paediatrics N=38 (NP studies) N= 15 (NM studies) Aim: To determine more conclusively the impact that nurses in these primary care roles have on health outcomes and the health care system.	Thirty-four outcomes were analysed. In studies that employed randomisation to provider, greater patient compliance with treatment recommendations was shown with nurse practitioners than with physicians. In studies that controlled for patient risk in ways other than randomisation, patient satisfaction and resolution of pathological conditions were greater for nurse practitioner patients. Nurse practitioners were equivalent to physicians on most other variables in controlled studies. In studies that controlled for patient risk, Nurse midwives used less technology and analgesia than did physicians in intrapartum care of obstetric patients. Nurse midwives achieved neonatal outcomes equivalent to those of physicians.
Butler et al. (2011).(39)	Population: Patients, nurses A. USA (mainly), Australia, UK, Netherlands + others not specified B. Hospitals C. Midwifery, medical, surgical, trauma, diabetes, neurological, cardiologic, psychiatric, gynaecological N=15 Aim: To explore the effect of hospital nurse staffing models on patient and staff-related outcomes.	No evidence that the addition of specialist nurses to nursing staff reduces patient death in rates, attendance at the emergency department, or readmission rates, but it is likely to result in shorter patient hospital stays and reductions in pressure ulcers. The evidence in relation to the impact of replacing RNs with unqualified nursing assistants on patient outcomes is very limited. It is suggested that specialist support staff (dietary assistants) may have an impact on patient outcomes. Self-scheduling and primary nursing may reduce staff turnover. Introduction of team midwifery (versus standard care) may reduce medical procedures in labour and result in a shorter length of stay without compromising maternal and perinatal safety. However, extreme caution is advised due to the limited evidence available.
Clark et al.	Population: Patients	Nurse led interventions for hypertension in primary care should include an algorithm to

Author/s	Background	Main findings
(2010).(44)	A. USA (mainly), Australia, England, Scotland, Mexico, Brazil, Canada, China, Finland, Norway B. General practices and nurse-led clinics C. Primary care N=33 Aim: To review trials of nurse led interventions for hypertension in primary care to clarify the evidence base, establish whether nurse prescribing is an important intervention, and identify areas requiring further study.	structure care and can deliver greater blood pressure reductions than usual care. There is some evidence of improved outcomes with nurse prescribers, but there is no evidence of good quality from UK studies of essential hypertension in primary care. Compared with usual care, interventions that included a stepped treatment algorithm showed greater reductions in systolic blood pressure (weighted mean difference -8.2 mmHg, 95% CI -11.5 to -4.9), nurse prescribing showed greater reductions in blood pressure (systolic -8.9mmHg, 95% CI -12.5 to -5.3 and diastolic -4.0 mmHg, 95% CI -5.3 to -2.7), telephone monitoring showed higher achievement of blood pressure targets (relative risk 1.24, 95% CI 1.08 to 1.43), and community monitoring showed greater reductions in blood pressure (weighted mean difference, systolic -4.8 mmHg, 95% CI -7.0 to -2,7 and diastolic -3.5 mmHg, 95% CI -4.5 to -2.5).
DeBroe et al. (2001).(51)	Population: Clinical specialist nurses for multiple sclerosis A. UK B. Hospital, C. Medical neurology N=1 Aim: The aim of this report is to assess the effectiveness and relative cost-effectiveness of multiple sclerosis specialist nurses in improving care and outcomes for patients with multiple sclerosis.	Only one study was identified that tried to evaluate the benefit of multiple sclerosis specialist nurses. The study concluded that multiple sclerosis patients and their carers found the multiple sclerosis specialist nurse to be helpful, particularly in improving their knowledge of multiple sclerosis, ability to cope, mood and confidence about the future. GPs also reported finding the nurse to be helpful with their multiple sclerosis patients and 40% of the GPs stated they would purchase the services of a multiple sclerosis specialist nurse if their practices became fund holding. There were considerable methodological weaknesses inherent in the study design, and it was unclear whether the results of the study could be extrapolated to other settings or to other multiple sclerosis patient groups.
Estabrooks et al. (2009).(40)	Population: RNs A. Not specified B. Hospitals C. Not specified N=12	Six articles investigated the relationship between shift length and quality of patient care – results were equivocal. Only one study offered support for 12-h shifts over 8-h shifts with respect to better patient care. The remaining studies either found no significant association between shift length and the quality of care patients received or favoured the 8-h shift. The relationship between shift length and the number of errors was examined in two studies. Both studies found a significant relationship between shift length and the numbers of nursing

Author/s	Background	Main findings
	Aim: To identify and analyse the available evidence on the effect of shift length (8-hours versus 12-hours shifts) on quality of patient care and healthcare provider outcomes	errors, with more errors occurring on longer (12-hs +) shifts. Likelihood of making an error was two times (first study) or three times (second study) higher when nurses worked shifts 12.5 h or greater. Healthcare provider outcomes: -Well-being: nurses who worked a compressed schedule (ie, work 12 h/day x7 days, then off x7 days) reported significantly higher levels of overall wellbeing than nurses who worked other shift schedules. -Health complaints (physical): working .12 h/day when combined with working .40 h/week was significantly associated with a higher number of musculoskeletal complaints (but neither on their own associated with this). -Health complaints (psychological): differences in experience were controlled for, similar levels of stress were found between 12 and 8 hr shifts. But others found those on 12 hr shifts had less stress and less emotional exhaustion. -Fatigue: One study found that nurses working a compressed 12-h shift system had significantly lower levels of fatigue 2 months after but 13 months after levels were comparable with baseline. -Drug and alcohol use: nurses working night shifts longer than 8 h also had the greatest risk for alcohol and tobacco use. -Job satisfaction: three studies found no significant differences in levels of job satisfaction among nurses working 8-h compared with 12-h shifts or before and after the implementation of a 12-h shift system, one study showed that 8h was better and one study showed that 12h was better.
Griffiths et al. (2005).(48)	Population: Patients A. UK, USA B. Inpatient, hospitals C. Medical, surgical N=9 Aim: Effectiveness of nurse-led units (NLUs) compared to usual post-acute care	Unclear which services are best suited to which patients. Evidence is stronger for Nurse Led Units than intermediate care in care homes.
Halcomb et al. (2007).(45)	Population: General practice nurses A. UK, Australia	Some evidence for practice nurse-led clinics in reducing cardiac risk factors in healthy adults, those with established disease and known risk factors. Practice nurse-led clinics are particularly supported in relation to BP management,

Author/s	Background	Main findings
	B. Not specified C. Not specified N=18 trials (33 papers) Aim: This review seeks to present the best available evidence regarding the efficacy of general practice nurse interventions for cardiac risk factor reduction in healthy adults, as well as those with established cardiovascular disease or known cardiac risk factors.	cholesterol reduction, dietary modification and increasing physical activity.
Hatem et al. (2008).(50)	Population: Midwives, obstetricians, family doctors A. Australia, Canada, New Zealand, UK B. Public health system C. Midwifery, obstetric, primary care N=11 Aim: To compare midwife-led models of care with other models of care for childbearing women and their infants. Other models of care include: (a)Obstetrician-provided care. (b) Family doctor-provided care, with referral to specialist obstetric care as needed. (c) Shared models of care, where responsibility is shared between different health professionals.	Women who had midwife-led models of care were less likely to experience antenatal hospitalisation, risk ratio (RR) 0.90, 95% confidence interval (CI) 0.81 to 0.99), regional analgesia (RR 0.81, 95%CI 0.73 to 0.91), episiotomy (RR 0.82, 95% CI 0.77 to 0.88), and instrumental delivery (RR 0.86, 95% CI 0.78 to 0.96), and were more likely to experience no intrapartum analgesia/anaesthesia (RR 1.16, 95% CI 1.05 to 1.29), spontaneous vaginal birth (RR 1.04, 95% CI 1.02 to 1.06), feeling. In control during childbirth (RR 1.74, 95% CI 1.32 to 2.30), attendance at birth by a known midwife (RR 7.84, 95% CI 4.15 to 14.81) and initiate breastfeeding (RR 1.35, 95% CI 1.03 to 1.76), although there were no statistically significant differences between groups for caesarean births (RR 0.96, 95% CI 0.87 to 1.06). Women who were randomised to receive midwife-led care were less likely to experience foetal loss before 24 weeks' gestation (RR 0.79, 95% CI 0.65 to 0.97), although there were no statistically significant differences in foetal loss/neonatal death of at least 24 weeks (RR 1.01, 95% CI 0.67 to 1.53) or in foetal/neonatal death overall (RR 0.83, 95% CI 0.70 to 1.00). In addition, their babies were more likely to have a shorter length of hospital stay (mean difference -2.00, 95% CI -2.15 to -1.85).
Hodgkinson et al.	Population: RNs, Nursing Assistants, Nursing orderlies	One study investigated primary care model v. team nursing model found that there was no difference on most measures. Where there was a difference primary care model was better.

Author/s	Background	Main findings
(2011).(41)	A. Netherlands, Canada B. Residential, subacute, long term care C. Aged care N=2 Aim: Evaluated the effectiveness of staffing models & skill mixes on resident & staff outcomes.	No significant difference on staff morale measures. The other study compared resident-oriented care v. Usual care. Degree of uptake of intervention: conduct of resident oriented tasks was only significant in psycho geriatric wards. Effectiveness of intervention: did not significantly improve resident/family satisfaction with care, resident well being or assessment of resident wellbeing by significant other. Co-ordination of care had significantly increased on ¾ wards also significant improvement in expressive aspects but not instrumental aspects.
Horrocks et al. (2002).(55)	Population: Advanced nursing roles A. Not specified B. Primary care, emergency department, minor injury unit C. Primary care, acute care N=34 Aim: Comparing nurse practitioners and doctors providing care at first point of contact for patients with undifferentiated health problems in a primary care setting, following outcomes: patient satisfaction, health status, costs, and process of care.	Randomised controlled trials (RCTs) found that patient satisfaction was higher for nurse practitioners than for doctors (Z=2.67, p=.008) but there was significant heterogeneity of results. Also three RCTs using dichotomous data found no significant difference. Nurse practitioners identified more physical abnormalities in (one study); gave more info to patient (one study); more complete records and better communication (two studies); more advice on self-care/management (two studies).
Kane et al. (2007).(71)	Population: Nurses, patients A. USA and Canada B. Acute care hospital C. ICU, medical and surgical wards N=96 in meta-analysis (N=68 rates of outcomes), (N=28 adjusted odds ratios) Aim: Association between registered nurse (RN) staffing and patient outcomes in acute care hospitals	Greater RN staffing was consistently associated with a reduction in the adjusted odds ratio of hospital related mortality. An increase by 1 RN full time equivalent (FTE) per patient day was associated with a 9% reduction in odds of death in intensive care units, 16% in surgical and 6% in medical patients. Higher RN staffing was associated with lower odds of several patient adverse events. Pooled analysis detected a significant and consistent reduction in odds of hospital-acquired pneumonia of 19% in all patients and 30% in intensive care units. An increase by 1 RN FTE per patient day was associated with a 60% lower odds of respiratory failure in intensive care units; unplanned extubation were 51%; odds of cardiac arrest 28% less in intensive care units per 1 additional RN FTE per patient day. In surgical patients, odds of failure to rescue and of nosocomial bloodstream infection were reduced by 16% and 36%, respectively. RN

Author/s	Background	Main findings
		staffing was not associated with odds of urinary tract infections and surgical bleeding. No studies reported adjusted odds ratio of pressure ulcers, patient falls, and upper gastrointestinal bleeding in relation to RN staffing But the arguments for a causal relationship are mixed.
Lankshear et al (2005).(37)	Population: Nurses A. Not specified B. Acute care hospitals C. Not specified N=22 Aim: We report on a systematic review of the international research on the relationship between the nursing workforce (level and skill mix) and patient outcomes (including mortality, failure-to-rescue, and complications) in the acute sector and consider its relevance for policy.	Strongly suggest that higher nurse staffing and richer skill mix (especially of RNs) are associated with improved patient outcomes, although the effect size cannot be estimated reliably. Longitudinal studies: One study showed that an increase in RN staffing levels was associated with reduced rates of pneumonia, urinary tract infections decubitus ulcers, and mortality. Interestingly, the size of the effect decreased the greater the base level of staffing. One study showed that hospitals with higher RN and LPN (licensed practical nurse) staffing had lower incidences of atelectasis, decubitus ulcers, falls, and urinary tract infections. Despite the variability in the quality of the studies, there is a consistent pattern of results. Nine large acute studies found a significant inverse relationship between RN staffing levels and mortality rates. Four studies also found negative associations between nurse staffing and failure to rescue (variably defined). Seven out of eight studies showed a positive association between RN or LPN hours or RN proportion and pneumonia. Two thirds of all the studies that examined the following outcomes also found a link between nurse staffing and urinary tract infections, decubitus ulcers, falls, and wound infections. In acute settings, total staffing and LPN staffing tend not to demonstrate a link with improved outcomes.
Latour et al. (2007).(49)	Population: Nurses A. USA (mainly) + others not specified B. Health maintenance organisations (HMO) mainly C. Primary care N=10 Aim: To summarise the available literature on the effectiveness of ambulatory nurse-led case management for complex patients in general health care	Readmissions: conflicting evidence. Three studies all of relatively high quality and one study of low quality reported a positive result in favour of the intervention group. Four studies (two high quality), could not demonstrate significantly better outcomes for case management. One study presented insufficient data. Hospital days: conflicting evidence. Four studies of high quality (two found positive results and two found no difference). Two low quality studies also found positive results. ED visits: strong evidence that case management has no significant effect on the number of ED visits. Functional status: no evidence that case management has a positive effect on the functional status of patients. Quality of life: conflicting evidence. Four studies measured quality of life (three presented insufficient data and also found no difference). One low quality study found evidence on the side of the intervention group.

Author/s	Background	Main findings
		Patient satisfaction: Moderate evidence. Three studies (insufficient data) – two (one high quality, one low quality) report in favour of the intervention, one (high quality) found no difference.
Laurant et al. (2005).(43)	Population: Primary care nurses (practice nurses, nurse practitioners, clinical nurse specialists, or advanced practice nurses) A. Not specified B. Primary care C. Ongoing care, urgent primary care, chronic disease N=16 studies (25 papers) Aim: To evaluate the impact of doctor-nurse substitution in primary care on patient outcomes, process of care, and resource utilisation including cost	A. First contact and ongoing care for all presenting patients -Patient outcomes: Two out of 25 outcomes were significantly better with nurse-led care, others no difference. -Patient satisfaction: One out of15 outcomes were significantly better with doctor-led care and 14 showed no significant difference. -Patient compliance: Out of four outcomes, none differed significantly. -Process of care: Three out of 12 outcomes measured were significantly better with nurse-led care. -Resource utilisation: Consultation rates no difference; Tests/investigations four out of 22 outcomes significant for nurses others no difference; Use of services: one out of 7 outcomes significant for nurses, others no different; Direct costs no significant differences. B. First contact care for patients wanting urgent attention -Patient outcomes: No difference. -Patient satisfaction: Twelve out of19 significant, others no difference. -Patient compliance: No difference -Process of care: Six out of8 outcomes measured, were better with nurse-led care (nurses provided more information). -Resource utilisation: Consultation length: all showed significantly longer consultations for nurses. Consultation rate: nurses were more likely than doctors to recall a patient. Prescribing rate: No difference. Tests /investigations: one out of 2 studies: higher for nurses. Use of other services: No difference C. Routine management of patients with chronic conditions: Patient outcomes: One out of 8 better with nurses. Patient satisfaction: Higher with nurses (one study). Compliance: No difference (one study). Patient knowledge: Higher in nurses (one study). Process of care: No difference (one study). Consultation rate: No difference (one study). Prescribing rates: No difference.

Author/s	Background	Main findings
Markle-Reid et al. (2006).(52)	Population: RNs, advanced nursing roles A. US, Canada, UK, Italy, Denmark, Netherlands B. Community C. Community nursing for > 65 years N=12 Aim: The need for a literature review of the effectiveness and efficiency of home-based-nursing health promotion was identified.	Effects on mortality: In four of the eleven studies investigating mortality rates, the intervention group showed a significantly lower mortality rate in comparison to the control group. Effects on health and functional status: Six studies looked at psychosocial factors. Only one study demonstrated favourable effects by reducing the level of depression. Four out of eight studies that examined functional status clearly showed that clients of in-home preventive programs are more likely than controls to experience and retain functional gains. Effects on caregivers: One study found caregivers in the intervention group expressed a significantly higher level of satisfaction with care than those in the usual care group. Hospital admission and hospital stay: Nine studies investigated the impact of the intervention on hospital admission and/or hospital stay. In five of these, the intervention group showed either a significantly lower number of admissions to a hospital or a lower number of days spent in a hospital compared to the control group One study found a reduction in hospital stay for younger subjects only (aged 65 to 74 years). Use of nursing homes: Eleven studies investigated the impact of the intervention on use of nursing homes. In five of these, the intervention group had a significantly lower use of nursing homes compared to the control group. Use of other health and social services: Nine studies investigated the impact of the intervention on use of other health and social services. Six of these studies showed a higher use of services such as primary health care providers and services promoting socialization compared to the control group. One study reported that the cost of the intervention for each year of disability-free life gained was about US$6,000, based on the number of permanent-stay nursing-home days avoided (Stuck et al. 1995). The other five studies conducted a partial economic evaluation using a cost analysis. Three of these studies showed cost savings because of the prevention of nursing-home admissions and hospital admissions.
Pearson et al. (2006a)(18)	Population: RNs, patients A. Thailand, Taiwan, USA, Scotland, Canada B. Medical center, nursing homes, hospitals, long-term facilities C. Medicine, surgery, aged care,	The evidence suggests strong correlations between patient characteristics and work environments; and workload and staffing and the quality of outcomes for clients, nurses and the system/organisation. A greater proportion of regulated staffing (i.e. RNs, enrolled nurses, practical or vocational nurses) is associated with improved outcomes related to the Functional Independence Measure score, the Short Form Health Survey (SF-36) vitality score, patient satisfaction with

Author/s	Background	Main findings
	orthopaedic, vascular, obstetric, acute care, long-term care N=40 Aim: to determine the impact of: • Patient characteristics, nurse characteristics, system characteristics and system processes on workload, scheduling and concepts of productivity and utilisation • Workload, scheduling and concepts of productivity and utilisation on the quality of outcomes for clients, nurses and the system/ organisation.	nursing care, patient adverse events (including atelectasis, decubitus ulcers, falls, pneumonia, postsurgical and treatment infection and urinary tract infections). An increase in the number of RN hours available is associated with improved patient outcomes in relation to falls, pneumonia, pressure ulcers, urinary tract infection, length of stay and postoperative infection rates.
Taylor et al. (2005).(46)	Population: Patients, community nurses A. Australia, UK, USA, Spain B. Inpatient, outpatient, community C. Chronic obstructive airways disease N=9 Aim: Determining the effectiveness of innovations in the management of chronic disease for patients with chronic obstructive pulmonary disease (COPD) involving nurses (leading, co-ordinating and delivering)	Interventions were variations on case management approach, ranging from one month (short) to 9-12 months (long) intervention. No improvements detected in quality of life, psychological wellbeing, disability or pulmonary function. Equivocal evidence around readmission rates (apart from study focusing on long term use of oxygen therapy). No evidence provided on dimensions such as patient satisfaction, self-management skills, adherence with treatment. Authors' comments: Little robust evidence to support nurse management of chronic obstructive pulmonary disease moderate/severe patients in community. Interventions evaluated to date do not have a detectable effect on mortality/disability/pt health related to quality of life. Evidence around other outcome (adherence/satisfaction/effect on carers) extremely weak or non-existent.
Thomas et al.	Population: Midwives, allied health professionals	Couldn't tell if guidelines were evidence based. Most common method of dissemination was distribution of printed educational materials.

Author/s	Background	Main findings
(1999).(56)	A. Not specified B. Variety of settings C. Variety N=18 Aim: Evaluations of interventions using G/L aimed to change professional practice	Some evidence to suggest educational interventions may be of value (better than passive dissemination). Review provided insufficient evidence to recommend particular dissemination strategies. No evidence to suggest that interventions which work for doctors would work for nurses + allied health. Active interventions to bring about change may be more effective than passive ones. Redefining/extending health professional role (to embrace the new activity) may be effective. Using opinion leader/expert in change may be effective.
Thomas et al. (2009).(57)	Population: Nurses, physicians, patients A USA (mainly), Australia, Hong Kong, UK, Canada B. Outpatient clinics, hospitals, walk-in-clinics, medical practices C. Mostly acute care, community care, emergency care N=18 Aim: Three comparisons: 1. Guidelines + dissemination versus no guidelines 2 Guidelines + intervention strategy A versus Guidelines + intervention strategy B (including role substitution) 3. Guidelines + professions allied to medicine versus Guidelines + doctor	Comparison 1: Improvements in processes of care + outcomes of care detected in Guidelines + dissemination groups. Comparison 2: Difficult to draw conclusions because of poor method. Comparison 3: Studies supported hypothesis that there is no difference in care given by nurses using clinical guidelines and standard physician care.
Thompson et al. (2008).(47)	Population: RNs A. USA (mainly), UK, Canada B. Patients' home, community C. Mental health N=9	Only one randomised controlled trial (RCT) therefore included quasi-experimental studies. Community nurses were not good at identifying mental health issues, particularly depression. Use of a standardised screening tool improved detection rates of mental health problems/part depression. Comprehensive nursing packages (which included screening and assessment around

Author/s	Background	Main findings
	Aim: Testing the effectiveness of community nurse-led interventions for older people at risk of mental health disorders – particularly depression.	mental health) were also effective. However, no evidence to suggest any long term benefits of any of the interventions.
Waldenström & Turnbull (1998).(47)	Population: Midwives A. UK, Canada, Australia, Sweden B. Ante-post natal care C. Midwifery N=7 Aim: Comparison of 'team midwifery' approach (continuity of care/low tech) V standard practice (obstetric led)	Team midwifery used less obstetric interventions during labour (e.g induction, augmentation of labour, electronic foetal monitoring, obstetric analgesia, instrumental vaginal delivery and episiotomy). No difference in caesarean rates. Reduced episiotomy rates for midwives group but higher perineal tears. Similar rates for intact perineums. No difference in maternal or child outcomes. No difference in terms of intensive care baby unit (ICBU) admissions. Duration of labour longer in midwifery group. No data on social support. Three trials did look at cost – midwives more cost effective
Wilson et al. (2011).(38)	Population: Nurses, patients A. USA, Canada B. Hospital C. Paediatric N=8 Aim: Identifying association between nursing staffing and clinical outcomes in hospitalised children	Comparison across studies difficult as few clinical outcomes were the same and also lack of consistence in reporting. Fourteen different healthcare associated infections detected as relating to nursing (nosocomial infection rate; nosocomial bacteraemia; bloodstream infection; post operative infection; central venous catheter infection; post-op pneumonia; device associated pneumonia; nosocomial respiratory syncytial virus infection; post op urinary tract infection; nosocomial viral gastrointestinal infection, rotovirus infection; central nervous system infection; skin infection; conjunctivitis). Ten further clinical outcomes used eight of which were adverse events – these included mortality; failure to rescue; medication administration error; post op cardiopulmonary complications; pressure ulcers; fluid overload; unplanned extubation; peripheral intravenous infiltrates; parent/family complaint; patient length of stay. Increased RN nursing hours per patient day was associated with decrease in eight adverse events. Higher RN skill mix contributed positively to three clinical outcomes in children. Appears to be a level where increasing RN hours no longer has significant effect on

Author/s	Background	Main findings
		decreasing adverse effects. Results reporting association between children's outcome and casual/agency staff are equivocal.
Wong et al. (2012). (38)	Population: Advanced nursing roles, respiratory nurses A. USA, UK, Australia, Canada, Hong Kong B. Community nursing C. COPD/respiratory N=9 Aim: The effectiveness of outreach respiratory health care worker programmes for chronic obstructive pulmonary disease (COPD) patients in terms of improving lung function, exercise tolerance and health related quality of life (HRQL) of patient and carer, and reducing mortality and medical service utilisation.	Health related quality of life: using the St George's Respiratory Questionnaire and meta analysis showed that this measure improved significantly following the intervention. However, there was equivocal evidence using the Sickness Impact Profile and SF-36. Mortality: The decrease in the number of deaths with the intervention was not statistically significant. Medical Service Utilisation: Meta-analysis demonstrated no significant change in the number of hospitalisations with the intervention. But with high heterogeneity due to 1 study – that excluded = increase in significant hospitalisations. Lung Function and Exercise Testing: No significant difference on either

EDUCATION Background: A= Geographical, B=Setting, C=Clinical specialty. N=number of included studies.

Author/s	Background	Main findings
Adriaansen & van Achterberg (2008).(63)	Population: Nurses, nursing students, health professionals A. Not specified B. Hospitals and hospices (mainly) C. Oncology, palliative care N= 27 Aim: What are the effects of education in palliative care at the undergraduate and postgraduate levels for nurses, student nurses and patients?	The review demonstrated that the described palliative care courses were successful but the majority of the studies had a moderate level of design. It remains unclear if these effects also led to improvements with patients. Integrated courses focused on a number of themes with a variety of didactical methods (including practical experience) are the most successful. Content of palliative care courses: communication and attitude, empathy, pain and symptom management and combined courses. For outcome measures, both validated and self-constructed rating scales (unclear validity) were used. Different effect measurements were used and therefore it was difficult to compare the studies. In general, positive effects were found on the communication skills of nurses, but this did not lead to improvement at the patient level. Results of courses on pain and symptom management were not unequivocal. It cannot be concluded that longer courses have a stronger effect than short courses.
Cant & Cooper (2010).(59)	Population: Nursing students, medical, midwifery, multi-professional teams A. North America, Australia B. Educational setting C. Not applicable– N= 12 Aim: The aim of the review was to study the quantitative evidence for medium to high fidelity Simulation (HFS) using manikins in nursing, in comparison to other educational strategies.	The interventions varied in terms of administration, exposure and assessment; therefore no meta-analysis could be undertaken. Seven studies used at least one validated assessment measure, for the other studies this information was unclear. All studies reported simulation as a valid teaching/learning strategy. Six of the studies demonstrated additional gains in knowledge, critical thinking ability, satisfaction or confidence compared with the control group (range 7-11%). Simulation may have some advantage over other teaching/learning methods but standardised outcome measures must be developed.
Edwards & Burnard (2003).(64)	Population: Mental health nurses, others A. UK, Ireland, USA, Australia, Japan, Sweden, Netherlands B. Community, forensic, hospital, ward/community C. Mental health	Much is known about the causes of stress and its impact in the workplace. Much less is known about the effectiveness of strategies to reduce stress. Some evaluation of strategies to reduce stress in mental health nurses has shown positive results in relation to relaxation therapy and training in behavioural therapeutic skills and techniques, but the research is not robust

Author/s	Background	Main findings
	N=70 Aim: The aim was to identify stressors, moderators and stress outcomes (i.e. measures included those related to stress, burnout and job satisfaction) for mental health nurses, as these have clear implications for stress management strategies.	
Hammick et al. (2007).(61)	Population: RNs, nursing students, others A. UK (mainly), USA, Finland, Sweden, Canada B. Not specified C. Emergency departments, intensive care, aged care, mental health, community, paediatrics, screening, primary care, diabetics, orthopaedics + others not specified N=21 Aim: To identify and review the strongest evaluations of inter-professional education (IPE). To classify the outcomes of IPE and note the influence of context on particular outcomes. To identify and discuss the mechanisms that underpins and informs positive and negative outcomes of IPE.	As the number of governments calling for enhanced collaboration amongst practitioners delivering services to the public grows, that call, frequently translated as a need for IPE, is then developed and delivered by educators and practice managers. Staff development to enable competent and confident facilitation of inter-professional learning is a key mechanism for effective IPE. Participants bring unique values about themselves and others into any IPE event which then interact in a complex way with the mechanisms that influence the delivery of the educational event. Authenticity and customisation of IPE so that it reflects appropriate and relevant service delivery settings are important mechanisms for a positive experience for the participants. Principles of adult learning for IPE are key mechanisms for well received IPE. Inter-professional education is generally well received by participants and enables practitioners to learn the knowledge and skills necessary for collaborative working; it is less able to positively influence attitudes and perceptions towards others in the service delivery team. In the context of quality improvement initiatives inter-professional education is frequently used as a mechanism to enhance the development of practice and improvement of services.
Jayasekara et al. (2006).(60)	Population: Undergraduate nursing students, nursing staff, healthcare, consumers	Four undergraduate nursing curriculum models were identified: integrated curriculum, subject-centred curriculum, problem-based learning (PBL), and an integrated critical thinking (CT) model.

Author/s	Background	Main findings
	A. Australia B. University C. Undergraduate education N=16 Aim: The effectiveness and appropriateness of undergraduate nursing curricula for nursing staff outcomes, consumer outcomes and system outcomes.	It was possible to examine the effectiveness of an integrated curriculum model and a subject-centred curriculum model; however, the other two models could not be compared because of a lack of evidence. Based on above findings, it is difficult to draw a conclusion regarding the effectiveness of integrated versus subject-centred approaches in undergraduate nursing curricula. The reported studies on PBL nursing curricula revealed that a number of variants of PBL in terms of definition, implementing strategies and evaluation methods within nursing curricula. It is therefore difficult to draw a conclusion regarding the effectiveness of the PBL approach in nursing curricula It is difficult to draw a meaningful conclusion regarding the effectiveness of an integrated CT curriculum model in undergraduate nursing education because of a limited number of high-quality comparative studies, and the variability of results from reported studies.
Laschinger, et al. (2008).(58)	Population: Educators pre-licensure practitioners in nursing, medicine or rehab therapy A. Australia, Canada, Germany, Ireland, New Zealand, Singapore, UK, USA B. Simulation lab C. Not applicable N=23 Aim: Identify the best available evidence on the effectiveness of using simulated learning experiences in pre-licensure health profession education.	Fifteen studies in medical schools with medical students, six studies were conducted in nursing schools with nursing students, and one study conducted with nursing and medical students and one study was conducted with health sciences students. Nursing students' cardiopulmonary resuscitation knowledge and skills were improved following a 4-h cardiopulmonary resuscitation training (using a Resusci-Anne skill-meter mannequin) was a decline in skills gained at 10 weeks post though not to pre-training levels. One study found students exposed to intermediate fidelity simulation training had a statistically significant improvement in skill performance on the second objective structured clinical examinations 6 months later compared to control. A second study into simulation training found that the experimental group had a greater improvement in skill performance than the control group. One study found that there were no significant cognitive gains after comparing two methods for teaching the skill of performing a 12-lead electrocardiography. In another study, student satisfaction with their learning method was moderately high for both the traditional lab group and the technology group Simulation-based training did not have a statistically significant effect on perceptions of stress or confidence about working in a highly technological setting in a study in which students were randomly allocated to either a control or an experimental group that experienced intermediate-fidelity scenario- based simulation.
Reeves et al.	Population: RNs +inter-professional samples	Four of these studies indicated that inter-professional education produced positive outcomes in the following areas: emergency department culture and patient satisfaction;

Author/s	Background	Main findings
(2008).(62)	A. Not specified B. Emergency departments, primary care practices, mental health provider organisations C. Emergency care, domestic violence advocate, primary care, mental health N=6 Aim: Inter-professional education (IPE) interventions compared to education interventions in which the same health and social care professionals learn separately from one another; and to assess the effectiveness of IPE interventions compared to no education intervention. However only studies assessing the second aim were included.	collaborative team behaviour and reduction of clinical error rates for emergency department teams; management of care delivered to domestic violence victims; and mental health practitioner competencies related to the delivery of patient care. In addition, two of the six studies reported mixed outcomes (positive and neutral) and two studies reported that the inter-professional education interventions had no impact on either professional practice or patient care. (direct quote)
van Wyk and Pillay-van Wyk (2010).(65)	Population: RNs A. Taiwan, Sweden, Canada, USA, Japan B. Hospital? community C. Secondary care, community care, primary care N=10 Aim: Interventions to support healthcare workers (nurses) in coping with work-related stress, preventing burnout, and improving job satisfaction without changing contractual conditions of service or physical work environments.	No studies assessed the effects of support groups for health workers. Eight studies assessed the effects of training interventions in various stress management techniques on measures of stress/job satisfaction. Two studies assessed the effects of management interventions on stress, job satisfaction and absenteeism. Three studies demonstrated the beneficial effect of stress management training interventions on job stress. Only one of the three studies showed the effect is sustainable over medium timeframe. One study showed the beneficial effect of high intensity, stress management training intervention on burnout. Low and moderate intensity stress management training interventions failed to demonstrate benefit on burnout or staff satisfaction. Management intervention (process consultation for nurse managers to improve their problem solving ability in interdisciplinary staff teams and improved skills at managing organisational change) demonstrated increases in job satisfaction, but failed to show effect on absenteeism. Insufficient evidence for the effectiveness of stress management training interventions to

Author/s	Background	Main findings
		reduce job stress and burnout. Low quality evidence suggests that longer –term interventions with refresher or booster sessions may have more sustained positive effect, but this needs further testing.

NURSE/MIDWIFE-PATIENT RELATIONSHIP Background: A= Geographical, B=Setting, C=Clinical specialty. N=number of included studies.

Author/s	Background	Main findings
Green et al. (2011).(70)	Population: Patients A. Australia, Sweden, USA + others not specified B. Hospital, community, nursing home, all healthcare settings C. Acute care, ED, intensive care, primary care, community nursing, aged care N=21 Aim: The purpose of this paper is to present a systematic, narrative review of the literature regarding the clinical effectiveness of nursing management strategies on stroke patient outcomes sensitive to nursing interventions. Subsequent investigation will explore current applications of nursing sensitive outcomes (NSO) to patients with stroke, and identify and validate measurable NSOs within stroke care delivery.	The most current research on NSOs has expanded from acute care settings to include settings such as primary care, specialised clinical areas including cardiac and intensive care, rehabilitation, home care, ambulatory community care and long-term care. Since nurses play an active role in patient care throughout the care continuum, work to identify nurses' impact in all care settings should be a priority area for future research. This review also demonstrated that not only is the range of settings expanding where NSOs are being measured and used to improve care, these NSOs are now being considered for all nursing disciplines and preparation levels. Very little evidence exists documenting the relationship between NSOs and acute stroke patient outcomes.
Haesler et al. (2006).(69)	Population: Nurses, management, family members, family caregivers, residents, patients A. Iceland, UK, Netherlands, USA, Australia, NZ, Canada, Sweden B. Nursing homes, respite care, hospitals, acute care, dementia care unit C. aged care, acute care, veterans, stroke N=35 Aim: Issues associated with staff-family relationship Issues that impact on development of relationships interactions to promote constructive relationship	Support from administration and management is more likely to results in positive effects from interventions to promote constructive interactions between staff-family. Staff characteristic important to promote constructive staff family relationships include: open and honest communication, work in partnership, provide information. Interventions to promote constructive relationships include: communication, education, provision of information, administrative support.

Author/s	Background	Main findings
Tay et al. (2010).(68)	Population: RNs A. USA, Netherlands, UK, China, Sweden, Norway B. Inpatient oncology units C. Oncology N=7 Aim: Factors affecting effective communication between registered nurses and adult oncology patients in inpatient setting	Genuineness, competency and supportive facilitation skills are important factors for nurses when communicating with oncology patients. However, the role of post-basic training in improving communication remained inconsistent. In patients, active participation in their own care and information-seeking behaviour promoted better nurse-patient communication. Conversely, inhibiting factors in nurses included task orientation, fear of own death and low self-awareness of own verbal behaviours. Nurses also communicated less effectively during psychological assessments and emotionally-charged situations. For patients, their unwillingness to discuss the disease/feelings, their preference to seek emotional support from family and friends and the use of implicit cues inhibited effective communication. Environmentally, a supportive ward environment increased the use of facilitative behaviour in nurses, whereas the existence of conflict among staff increased the use of blocking behaviours. Cultural norms in the Chinese society also inhibited nurse-patient communication.

APPENDIX V: EXCLUDED SYSTEMATIC REVIEWS

Author, title and journal	Reason for exclusion
Attree M, Flinkman M, Howley B, Lakanmaa R-L, Lima-Basto M, Uhrenfeldt L. A review of nursing workforce policies in five European countries: Denmark, Finland, Ireland, Portugal and United Kingdom*/England. Journal of Nursing Management. 2011;19(6):786-802.	Critical appraisal not described
Aylward S, Stolee P, Keat N, Johncox V. Effectiveness of continuing education in long-term care: a literature review. Gerontologist 2003;43(2):259-71.	Critical appraisal not described
Bostick J, Rantz M, Flesner M, Riggs C. Systematic review of studies of staffing and quality in nursing homes. Journal of the American Medical Directors Association. 2006;7(6):366-76.	Critical appraisal not described
Brady M, Furlanetto D, Hunter R, Lewis S, Milne V. Staff-led interventions for improving oral hygiene in patients following stroke. Cochrane Database of Systematic Reviews 2006, Issue 4. 2006.	Critical appraisal not described
Burckhardt C, Hanestad B. Nursing strategies and quality of life outcomes: a systematic review. Nursing Science and Research in the Nordic Countries 2003; . 2003;23(67): 4-9.	Unclear search strategy, unclear critical appraisal procedure
Case R, Haynes D, Holaday B, Parker V. Evidence-Based Nursing: The Role of the Advanced Practice Registered Nurse in the Management of Heart Failure Patients in the Outpatient Setting. Dimensions of Critical Care Nursing 2010;29 (2):57-62.	Critical appraisal not described
Coombs M, Lattimer V. Safety, effectiveness and costs of different models of organising care for critically ill patients: Literature review. International Journal of Nursing Studies. 2007;44(1):115-29.	Critical appraisal not described
Cooper SJR, Grant J. New and emerging roles in out of hospital emergency care: A review of the international literature. International Emergency Nursing. 2009;17(2):90-8.	Unclear reporting of methods
Cotton J, Tuttle J. Employee Turnover: A Meta-Analysis and Review with Implications for Research. The Academy of Management Review 1986;11(1):55-70.	Poor methodology. Limited description of search strategy and sources of studies. Critical appraisal not described

Craven M, Bland R. Better practices in collaborative mental health care: an analysis of the evidence base. Canadian Journal of Psychiatry. 2006;51(6 Suppl 1):7S-72S.	Critical appraisal not described
Crossan F, Ferguson D. Exploring nursing skill mix: a review. Journal of Nursing Management. 2005;13(4):356-62.	Critical appraisal and interrater reliability not described,
Davey MM, Cummings G, Newburn-Cook CV, Lo EA. Predictors of nurse absenteeism in hospitals: a systematic review. Journal of Nursing Management. 2009;17(3):312-30.	Critical appraisal not described
Gershon RRM, Stone PW, Zelstser M, Faucett J, Macdavitt K, Chou S-S. Organizational Climate and Nurse Health Outcomes in the United States: A Systematic Review. Industrial Health. 2007;45(5):622-36	Critical appraisal not described
Jeon Y-H, Merlyn T, Chenoweth L. Leadership and management in the aged care sector: A narrative synthesis. Australasian Journal on Ageing. 2010;29(2):54-60.	Critical appraisal not described, data extraction unclear
Lang T, Hodge M, Olson V, Romano P, Kravitz R. Nurse-patient ratios: a systematic review on the effects of nurse staffing on patient, nurse employee, and hospital outcomes. Journal of Nursing Administration. 2004;34(7-8):326-37.	Unclear search strategy and critical appraisal not described
Lu H, While AE, Louise Barriball K. Job satisfaction among nurses: a literature review. International Journal of Nursing Studies. 2005;42(2):211-27.	Critical appraisal and data extraction unclear
McNaughton DB. A Synthesis of Qualitative Home Visiting Research. Public Health Nursing. 2000;17(6):405-14.	Critical appraisal not described
Müller-Staub M, Lavin MA, Needham I, Van Achterberg T. Nursing diagnoses, interventions and outcomes – application and impact on nursing practice: systematic review. Journal of Advanced Nursing. 2006;56(5):514-31.	Unclear and limited critical appraisal procedure. No method used to minimise error in data extraction
Numata Y, Schulzer M, Van Der Wal R, Globerman J, Semeniuk P, Balka E, et al. Nurse staffing levels and hospital mortality in critical care settings: literature review and meta-analysis. Journal of Advanced Nursing. 2006;55(4):435-48.	Unclear critical appraisal
Oroviogoicoechea C, Elliott B, Watson R. Review: evaluating information systems in nursing. Journal of Clinical Nursing. 2008;17(5):567-75.	Critical appraisal not described
Spenceley S, O'Leary K, LLChizawsky, Ross A, Estabrooks C. Sources of information used by nurses to inform practice: An integrative review. International Journal of Nursing Studies. 2008;45(6):954-70.	Unclear reporting regarding critical appraisal and outcomes
Spiby H, McCormick F, Wallace L, Renfrew MJ, D'Souza L, Dyson L. A systematic review of education and evidence-based practice interventions with health professionals and breast feeding counsellors on duration of breast feeding. Midwifery.	Unclear reporting regarding critical appraisal. Out of date search period

2009;25(1):50-61.	
Stuck A, Egger M, Hammer A, Minder C, Beck J. Home visits to prevent nursing home admission and functional decline in elderly people: Systematic review and meta-regression analysis. JAMA: The Journal of the American Medical Association. 2002;287(8):1022-8.	Unclear critical appraisal procedure. Lack of interrater reliability
Stuck AE, Siu AL, Wieland GD, Rubenstein LZ, Adams J. Comprehensive geriatric assessment: a meta-analysis of controlled trials. The Lancet. 1993;342(8878):1032-6.	Unclear method and methodology
Sullivan E, Francis K, Hegney D. Triage, treat and transfer: reconceptualising a rural practice model*. Journal of Clinical Nursing. 2010;19(11-12):1625-34.	Unclear search strategy and critical appraisal not described
Sulosaari V, Suhonen R, Leino-Kilpi H. An integrative review of the literature on registered nurses' medication competence. Journal of Clinical Nursing. 2011;20(3-4):464-78.	Unclear search strategy and critical appraisal not described
Toh SG, Ang E, Devi MK. Systematic review on the relationship between the nursing shortage and job satisfaction, stress and burnout levels among nurses in oncology/haematology settings. International Journal of Evidence-Based Healthcare. 2012;10(2):126-41.	Unclear critical appraisal and data extraction procedures
Wagner JIJ, Cummings G, Smith DL, Olson J, Anderson L, Warren S. The relationship between structural empowerment and psychological empowerment for nurses: a systematic review. Journal of Nursing Management. 2010;18(4):448-62.	Unclear data extraction procedure
West E, Mays N, Rafferty AM, Rowan K, Sanderson C. Nursing resources and patient outcomes in intensive care: A systematic review of the literature. International Journal of Nursing Studies. 2009;46(7):993-1011.	Limitations in sources of studies and critical appraisal procedure