Management and organisational approaches to safe nursing and midwifery staffing

Evidence review

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Contents

Executive Summary **5**
1 Overview **7**
1.1 Introduction 7
1.2 Review Questions 8
2 Methods **10**
2.1 Overview 10
2.2 Search Strategy 11
2.2.1 Review of reviews search 11
2.2.2 'Gap' Search 12
2.2.3 'Top up' Searches 12
2.3 Screening Criteria 13
2.3.1 Operational definitions 14
2.3.2 Outcomes 15
2.4 Search Results 16
2.4.1 Review of Reviews 16
2.4.2 'Gap' Search 16
2.4.3 'Top up' Searches 16
2.5 Critical Appraisal and Quality Assessment – Review of Reviews 19
2.5.1 R-AMSTAR checklist for systematic reviews 19
2.6 Data Extraction and Evidence Tables – Review of Reviews 20
2.7 Evidence Synthesis – Review of Reviews 20
3 Results – Review of Reviews **21**
3.1 Review Question 1 21
3.1.1 Review Question 22
3.1.2 Evidence 22
3.1.3 Evidence Statements 37
3.2 Review Question 2 39
3.2.1 Review Question 39
3.2.2 Evidence 39
3.2.3 Evidence Statements 39
3.3 Review Question 3 40
3.3.1 Review Question 40
3.3.2 Evidence 40
3.3.3 Evidence Statements 45
3.4 Review Question 4 46
3.4.1 Review Question 46
3.4.2 Evidence 46
4.4.3 Evidence Statements 64
3.5 Review Question 5 66
3.5.1 Review Question 66
3.5.2 Evidence 66
3.5.3 Evidence Statements 74
4 Conclusions **77**
4.1. Summary of the evidence 77
4.2. Gaps in the evidence 77
4.3. Suggested research areas 78
5 References **80**
5.1 Bibliography 80

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5.2 Included Reviews 80

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Executive Summary

In 2013 the Department of Health and NHS England asked the National Institute for Health and Care Excellence (NICE) to develop evidence based guidelines on safe staffing with a particular focus on nursing staff for England.

NICE began work on the fifth topic it was referred - management and organisational approaches that support safe staffing in 2015. This report presents the findings from systematic review of the available evidence. In June 2015 the Safe Staffing guideline programme was suspended.

The review presented in this report aims to systematically identify, assess and synthesise the available evidence relating to the following questions:

- What staff and team management approaches are effective for supporting safe staffing across an organisation and how should they be implemented? For example:
    - What methods for assessing or changing management approaches are effective and how reliable and valid are they?
    - How often should the approaches be used?
    - How do these approaches influence the delivery of safe nursing and midwifery care?
- What management systems are effective for supporting safe staffing across an organisation and how should they be implemented? For example:
    - What methods for assessing or changing management systems are effective and how reliable and valid are they?
    - How often should the approaches be used?
    - How do these approaches influence the delivery of safe nursing and midwifery care?
- What approaches for addressing risk to patient care posed by variation in demand for services, variation in patient or service user needs, or deficits in nursing and midwifery staff levels and skill mix across an organisation are effective? How should they be implemented? For example:
    - What methods for assessing or changing approaches for addressing risk to patient care posed by variation in demand for services, variation in patient or service user needs, or deficits in nursing and midwifery staff levels and skill mix are effective and how reliable and valid are they?
    - How often should the approaches be used?
    - How do these approaches influence the delivery of safe nursing and midwifery care?
- What organisational approaches are effective for assessing and changing organisational culture and support safe staffing for nursing and midwifery across an organisation? How should these approaches be implemented? For example:
    - What methods for assessing or changing organisational culture are effective and how reliable and valid are they?
    - How often should the approaches be used?

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  - How do these approaches influence the delivery of safe nursing and midwifery care?

- What organisational approaches are effective for assessing and changing organisational leadership and support safe staffing for nursing and midwifery across an organisation? How should these approaches be implemented? For example:
  - What methods for assessing or changing organisational leadership are effective and how reliable and valid are they?
  - How often should the approaches be used?
  - How do these approaches influence the delivery of safe nursing and midwifery care?

The evidence review presented in this report consists of 3 main elements. The first element is a 'review of reviews' that presents a high level overview of the evidence available from other published systematic reviews. The second element is a search for relevant primary research to address review questions where no review-level evidence was found ('gap' searches). The third element is a search for relevant primary research that has been published since the relevant systematic reviews were published ('top up' searches).

For the review of reviews, fifteen systematic reviews were identified for inclusion in this report. This included 3 'empty' systematic reviews that did not identify any studies for inclusion. Five of the 15 systematic reviews addressed staff and team management approaches to safe staffing while another 5 addressed approaches for assessing and changing organisational culture. Three systematic reviews focused on approaches to addressing deficits in nursing and midwifery staff levels and 2 investigated approaches to changing organisational leadership. No systematic reviews of relevant economic evaluations or analyses were identified to address any of the review questions.

The 15 systematic reviews included in this report assessed the effectiveness of a wide variety of management and organisational approaches. The interventions identified within the included reviews were highly heterogeneous and many were complex interventions comprising numerous diverse elements. Findings were generally mixed and overall there was a lack of high quality systematic review-level evidence to support robust conclusions about the effectiveness of management and organisational approaches to support safe staffing for nurses and midwives.

The 'top up' searches returned 33,243 references for screening. The results of these searches are available on request to anyone who may be undertaking research on this topic in the future.

No systematic reviews were identified to assess the effectiveness of management systems to support safe staffing. Therefore a 'gap' search was performed to identify relevant primary studies. A reference list of 313 provisionally identified papers from this search is provided in the appendices of this report.

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1 Overview

The National Institute for Health and Care Excellence (NICE) was asked by the Department of Health and NHS England to develop an evidence based guideline on management and organisational approaches to support safe staffing for nursing and midwifery. NICE began work on this topic in February 2015 and a scope was developed which outlined the 5 review questions to be addressed by this evidence review.

This report presents the systematic review findings which were going to inform the development of this topic area. In June 2015 the Safe Staffing guideline programme was suspended.

1.1 Introduction

Recent reports and policy documents highlight the importance of effective organisational and management strategies, policies and interventions in ensuring the delivery of safe, high quality care across health and social care services. For example, NHS services should have an open and transparent organisational culture that enables safe, high-quality and compassionate care to be continually provided and improved in line with the following principles outlined in the Francis report:

- commitment to common values throughout the organisation by all involved
- fundamental standards that are readily accessible and can be complied with
- rigorous policing of compliance with the fundamental standards and zero tolerance of a lack of compliance
- openness, transparency and candour throughout the organisation
- strong leadership in nursing and midwifery
- strong support for leadership roles
- accountability of everyone within the organisation
- information on performance accessible and useable by all, allowing effective comparison by individuals, services and organisation.

Leadership has been identified as the most influential factor in shaping organisational culture (King's Fund 2014). The 2014 King's Fund survey on culture and leadership in the NHS revealed that staff views of leadership in the NHS have improved over time, but most staff still believe that leadership is poor or very poor. The survey also revealed a difference in staff views about their organisational culture – board executives were more positive about the organisational culture than other staff, particularly nurses. Importantly, only 40% of responders agreed that concerns would be dealt with properly. Therefore, there is still a long way to go towards achieving services with organisational cultures that nurture safe, high-quality and compassionate care. The King's Fund has been commissioned to review leadership and management in NHS services:

- The King's Fund (2015) Leadership and leadership development in health care: the evidence base

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- The King's Fund (2014) Developing collective leadership for healthcare
- The King's Fund (2013) Patient-centred leadership: rediscovering our purpose
- The King's Fund (2012) Leadership and engagement for improvement in the NHS: together we can
- The King's Fund (2011) The future of leadership and management in the NHS: no more heroes

Other general policy documents that highlight the need for guidelines on management and organisational approaches to safe staffing include:

- Department of Health (2015) Culture change in the NHS: applying the lessons of the Francis Inquiries
- National Quality Board (2013) How to ensure the right people, with the right skills, are in the right place at the right time: a guide to nursing, midwifery and care staffing capacity and capability
- Department of Health (2013) Hard truths: the journey to putting patients first
- Department of Health (2011) NHS staff management and health service quality

The evidence review presented in this report is intended to identify the evidence base which would help determine the effectiveness of management and organisational approaches to support safe staffing across all settings in which NHS nursing and midwifery care is delivered.

1.2 Review Questions

Five review questions were identified and developed during the scoping of this topic:

1. What staff and team management approaches are effective for supporting safe staffing across an organisation and how should they be implemented?
    - What methods for assessing or changing management approaches are effective and how reliable and valid are they?
    - How often should the approaches be used?
    - How do these approaches influence the delivery of safe nursing and midwifery care?

2. What management systems are effective for supporting safe staffing across an organisation and how should they be implemented?
    - What methods for assessing or changing management systems are effective and how reliable and valid are they?
    - How often should the approaches be used?
    - How do these approaches influence the delivery of safe nursing and midwifery care?

3. What approaches for addressing risk to patient care posed by variation in demand for services, variation in patient or service user needs, or deficits in nursing and midwifery staff levels and skill mix across an organisation are effective? How should they be implemented?

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- What methods for assessing or changing approaches for addressing risk to patient care posed by variation in demand for services, variation in patient or service user needs, or deficits in nursing and midwifery staff levels and skill mix are effective and how reliable and valid are they?
- How often should the approaches be used?
- How do these approaches influence the delivery of safe nursing and midwifery care?

4. What organisational approaches are effective for assessing and changing organisational culture and support safe staffing for nursing and midwifery across an organisation? How should these approaches be implemented?
   - What methods for assessing or changing organisational culture are effective and how reliable and valid are they?
   - How often should the approaches be used?
   - How do these approaches influence the delivery of safe nursing and midwifery care?

5. What organisational approaches are effective for assessing and changing organisational leadership and support safe staffing for nursing and midwifery across an organisation? How should these approaches be implemented?
   - What methods for assessing or changing organisational leadership are effective and how reliable and valid are they?
   - How often should the approaches be used?
   - How do these approaches influence the delivery of safe nursing and midwifery care?

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2 Methods

2.1 Overview

Given the breadth of the review topic, a decision was taken to approach the evidence review presented in this report in 3 stages:

- A 'review of reviews' through a review of secondary evidence from published systematic reviews.
- Searches for primary studies when no review-level evidence was found to address a particular review question ('Gaps' search).
- 'Top-up' searches for additional primary studies published after the last search date of any identified reviews.

This systematic 'review of reviews' was conducted in accordance with Developing NICE Guidelines: the manual (NICE 2014) and Methods for the development of NICE public health guidance (third edition) (NICE 2012).

The evidence review included the following steps:

- For the review of reviews:
  - Databases were searched using a peer-reviewed search strategy (Appendix A).
  - Potentially relevant systematic reviews, including reviews of economic evaluations, were identified by reviewing titles and abstracts using the pre-specified inclusion and exclusion criteria described in the review protocols (Appendix B). A second reviewer performed a consistency check by screening the titles and abstracts of a random sample of 10% of the references against the same checklist. Inter-rater agreement between the 2 reviewers was 100%.
  - The full text of all references assessed to be potentially relevant were retrieved and independently screened against the pre-specified inclusion and exclusion criteria (Appendix B) by two reviewers. Any disagreements between the 2 reviewers were discussed and resolved with recourse to a third reviewer when necessary.
  - Included systematic reviews were quality appraised using the R-AMSTAR tool. A second reviewer performed a consistency check by critically appraising a random sample of 30% of the included reviews.
  - Relevant data from included systematic reviews were extracted into evidence tables (Appendix C). Each evidence table was independently checked by 2 other reviewers.
  - The evidence from primary studies included within the systematic reviews was also summarised into results tables and a narrative description of the findings was produced.
  - Evidence statements were generated.
- For the 'gap' searches:
  - Databases were search using a peer-reviewed search strategy (Appendix A).

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  - Potentially relevant primary studies, including economic evaluations, were identified by reviewing titles and abstracts using the pre-specified inclusion and exclusion criteria described in the review protocols (Appendix B).
  - A reference list of the provisionally identified full text papers was produced (Appendix D), as this may prove useful for others who may be undertaking research on this topic in the future.
- For the 'top up' searches:
  - Databases were search using a peer-reviewed search strategy (Appendix A). The search results for each top up search are available on request.

2.2 Search Strategy

2.2.1 Review of reviews search

A search strategy and review protocol were developed to identify relevant systematic reviews including reviews of economic evaluations (see Appendices A and B). The search strategy was developed by an information specialist and was quality assured by a colleague within NICE's Information Services team.

The search strategy included the following databases:

- Cochrane Database of Systematic Reviews (CDSR)
- Cochrane Effective Practice and Organisation of Care (EPOC) group reviews
- Cumulative Index to Nursing and Allied Health Literature (CINAHL)
- Database of Abstracts of Reviews of Effects (DARE)
- EconLit
- Embase
- Health Business Elite
- Health Management Information Consortium (HMIC)
- Health Technology Assessment Database (HTA)
- Medline
- Medline-In-Process
- NHS Economic Evaluation Database (NHS EED)

To identify other potentially relevant evidence, the following resources and approaches were also used:

- Google Scholar and NICE Evidence were searched for grey literature.
- Potentially relevant references provided by stakeholders during scope consultation were considered, as were any additional studies identified by NICE.

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- Backwards and forwards citation searching on included reviews and other relevant papers was undertaken as required.

Following the advice from a topic expert, a date restriction of 1998 was imposed on the systematic review and primary studies published before this date, or which used data collected before this date, were excluded. This is because practice and standards within healthcare organisations have changed substantially since the late 1990s.

2.2.2 'Gap' Search

No systematic reviews were identified to address review question 2. To address this, a separate search was undertaken to identify relevant primary studies. This search strategy was designed and peer-reviewed by NICE information specialists; full details are available in Appendix A.

The search strategy included the following databases:

- Cochrane Central Register of Controlled Trials (CENTRAL)
- Cochrane Database of Systematic Reviews
- Cumulative Index to Nursing and Allied Health Literature (CINAHL)
- Database of Abstracts of Reviews of Effect (DARE)
- Embase
- EconLit
- Health Business Elite
- Health Management Information Consortium (HMIC)
- Medline
- Medline-In-Process

Following the advice from a topic expert, a date restriction of 1998 was imposed on the primary studies, and studies published before this date, or which used data collected before this date, were excluded. This is because practice and standards within healthcare organisations have changed substantially since the late 1990s.

2.2.3 'Top up' Searches

While 15 systematic reviews were identified to address review questions 1, 3, 4 and 5, the systematic reviews were published between 1 month and 8 years ago and many only partially addressed the review questions. To address this, 'top up' searches were planned to identify any relevant primary studies that were not published at the time the various systematic reviews were published.

The search strategies for these top up searches were designed and peer-reviewed by NICE information specialists. Three search strategies were designed for this search: 1 each for review questions 1 and 3, and a combined search strategy for review questions 4 and 5. All

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of the search strategies were run at the same time; full details are available in Appendix A. The combined search results for review questions 4 and 5 were separated in Endnote to create separate lists of search results for each question. The list of search results for review question 5 includes all of the studies from the combined search. The list of search results for review question 4 is identical to review question 5 except that all of the references for papers published before 2008 were removed from the search results, as the last search date of the included systematic reviews for review question 4 was 2009.

The search strategies included the following databases:

- Cochrane Central Register of Controlled Trials (CENTRAL)
- Cumulative Index to Nursing and Allied Health Literature (CINAHL)
- EconLit
- Embase
- Health Business Elite
- Health Management Information Consortium (HMIC)
- Health Technology Assessment Database (HTA)
- Medline
- Medline-In-Process
- NHS Economic Evaluation Database (NHS EED).

2.3 Screening Criteria

Review of Reviews

Full text papers were requested for all references identified through the search strategy that had titles and abstracts which looked relevant to any of the review questions.

All full text papers for the 'review of reviews' underwent a 2 stage screening process.

The full text papers had to meet the following 3 broad criteria in order to be classified as a systematic review:

- conduct a search of at least 2 electronic databases
- screen identified studies against an a priori research question or pre-specified inclusion criteria
- assess the scientific quality of all included studies

To maximise the applicability of identified evidence to current UK health and social care settings, criteria were applied to restrict inclusion to reviews which included a high proportion of relevant evidence. For a systematic review to be eligible for inclusion in this 'review of reviews' at least 80% of its included studies had to meet all of the following criteria:

- conducted in an OECD country **and**

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- conducted no earlier than 1998 **and**
- primary research articles (i.e. not a case study, opinion piece or editorial etc.).

This 80% relevance threshold is recommended in Methods for the development of NICE public health guidance (third edition) (NICE 2012).

All systematic reviews which met the criteria listed above were then assessed against the inclusion and exclusion criteria set out in the review protocol (Appendix B). Systematic reviews had to consider the effectiveness of organisational and management approaches which may support safe staffing for nurses and midwives. Systematic reviews examining the effectiveness of different models of care or service delivery were not within the scope of this review and were discarded. Systematic reviews which assessed organisational and management approaches without clear links to nursing or midwifery staff were also excluded. Examples of management and organisational approaches are provided under each review question. A full list of the inclusion and exclusion criteria for this evidence review can be found in the review protocol in Appendix B.

'Gap' Search

The results of the 'gap' search were screened based on title and abstract. References with abstracts that met the inclusion criteria (or did not meet the exclusion criteria) outlined in the review protocol (Appendix B) are included in the reference list in Appendix D.

'Top up' Searches

The results of the 'top up' searches were not screened. The total number of search results is reported in section 2.4.3.

2.3.1 Operational definitions

Nursing and midwifery staffing: the group of workers delivering 'hands on' nursing or midwifery care in an NHS setting including:

- registered nurses
- registered midwives
- non-registered nursing and midwifery staff such as healthcare assistants, maternity support workers and assistant practitioners.

Organisational or management approach: This is a broad term intended to encompass any policy, strategy or intervention implemented at an organisational level; that is, any approach which applies across an organisation. The unit of organisation may vary, for example, an entire NHS Trust or a single residential care home. The term excludes approaches only implemented in specific settings within a wider organisation (for example, one department or ward within a hospital) as well as those policies which are enacted at a more structural level (for example, national policies governing the work of nurses and midwives). Specific examples of management and organisational approaches are provided under each review question.

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2.3.2 Outcomes

Box 1 shows a list of the outcomes that were considered when searching for and assessing the references and full text papers. It should be noted that this list is not exhaustive and any outcomes that were linked to nursing in the studies were included in the evidence review presented in this report. Many of these outcomes were not present in the literature.

Box 1. Outcomes considered

Organisational culture
Attitudes of patients and staff
Bullying of patients and staff
Staff morale
Openness and transparency
Standards of care
Staff engagement
Safety events
Deaths and serious untoward incidents attributable to problems with the delivery of care
Serious largely preventable patient safety incidents that should not have occurred if available preventative measures had been implemented (also known as 'never events); for example, entrapment in bedrails and failure to monitor and respond to oxygen saturation
Occurrence of red flag events
Other safety outcomes; for example, violence and aggression, falls, pressure ulcers, infection, use of restrictive interventions and medication administration errors
Delivery of care
Length of stay
Readmission rates
Completing observations and clinical documentation
Missed care or unmet need
Experience and feedback
Patient or carer experience and satisfaction
Staff experience and satisfaction
Complaints
Other
Staff absenteeism
Nursing and midwifery staff leaver rates
Nursing and midwifery staff vacancies
Spend on bank and agency staff
Unpaid overtime
Missed breaks
Litigation
Resource use and costs
Number of disciplinary proceedings

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2.4 Search Results

2.4.1 Review of Reviews

The database searches returned 4268 references for screening. Suggestions from stakeholders and forward and backwards citation searching identified a further 271 references for title/abstract screening. In total 4539 titles and abstracts were screened of which 4053 were rapidly excluded and 232 were requested for full text assessment.

Of the 232 full text papers screened, 15 systematic reviews met the inclusion criteria and were thus included in the evidence review presented in this report. A list of the papers excluded at the full text assessment stage is available in Appendix E along with the reasons for their exclusion. Figure 1 illustrates the process for screening search results.

2.4.2 'Gap' Search

The database searches returned 14,227 references for screening. Of these, 13,914 were rapidly excluded via title/abstract screening and 313 were identified for full text assessment. A reference list of the potentially relevant full papers is provided in Appendix D, as this may prove useful for others who may be undertaking research on this topic in the future. Figure 2 illustrates the process for identifying the potentially relevant full text papers.

2.4.3 'Top up' Searches

The database searches returned 33,243 references for screening, as follows:

- 6574 references for review question 1
- 8967 references for review question 3
- 6837 references for review question 4
- 10,865 references for review question 5.

These search results are available on request to anyone who may be undertaking research on this topic in the future. Figure 3 illustrates the search process for the 'top up' searches.

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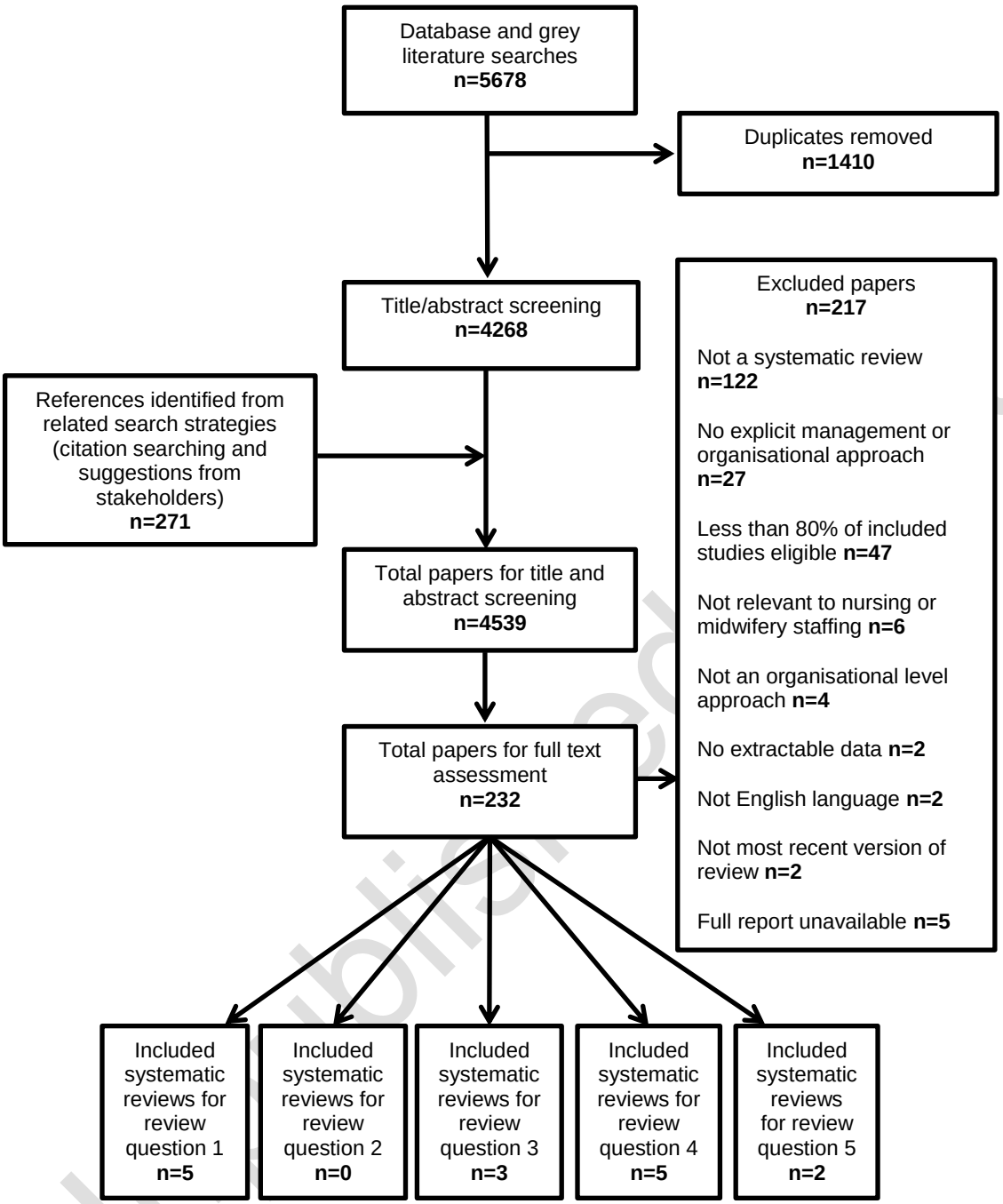

Figure 1: Flow diagram of included systematic reviews for review of reviews search

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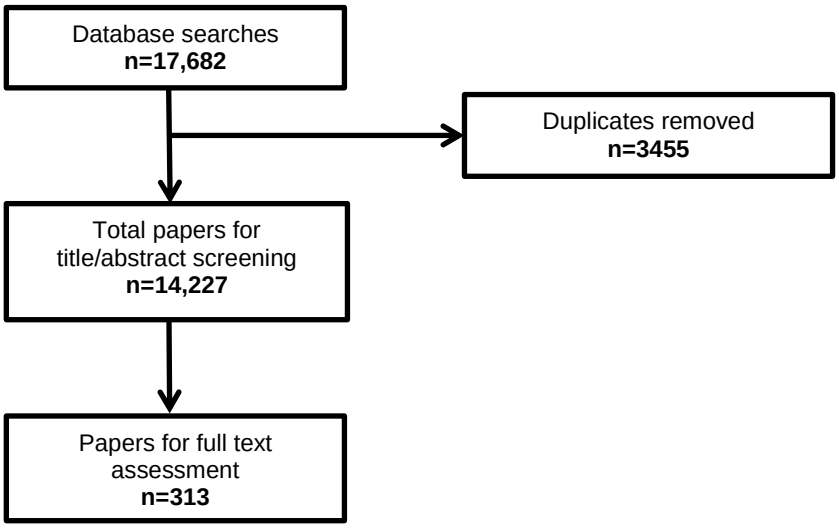

Figure 2: Flow diagram of 'gap' search for review question 2

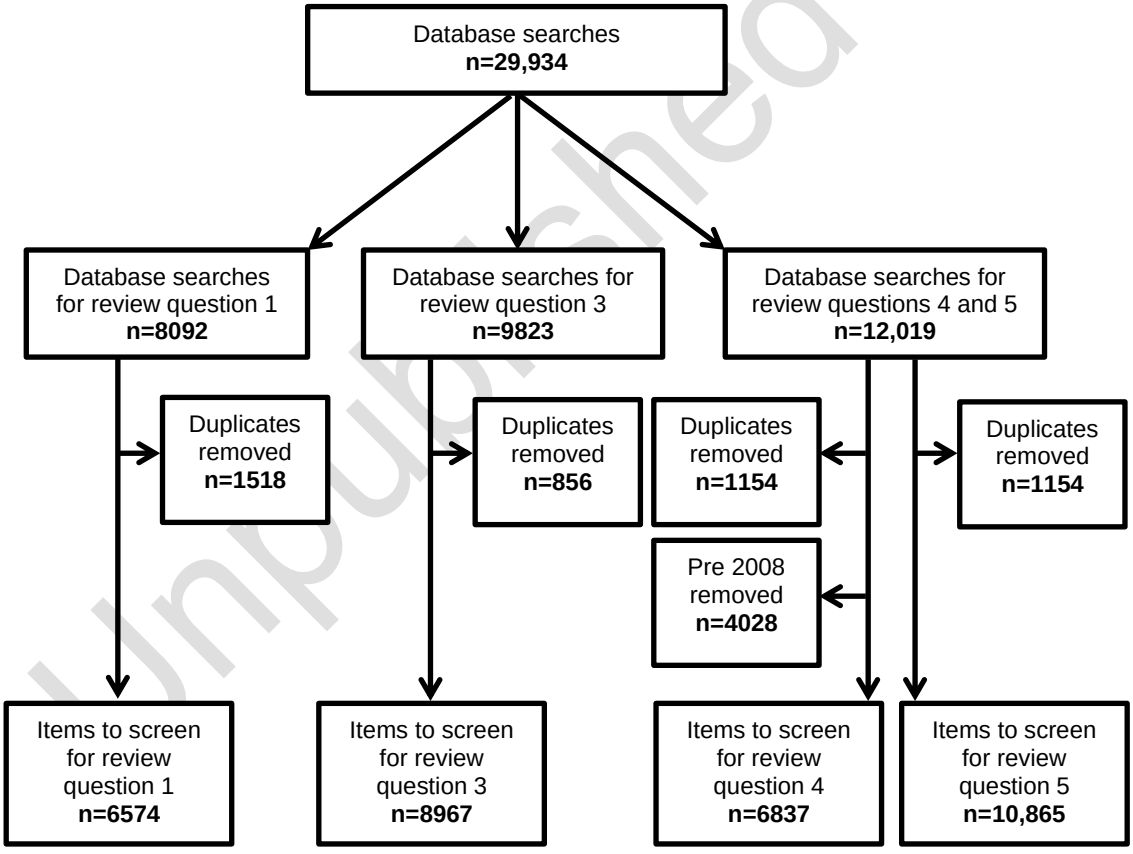

Figure 3: Flow diagram of 'top up' searches for review questions 1, 3, 4 and 5

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2.5 Critical Appraisal and Quality Assessment – Review of Reviews

2.5.1 R-AMSTAR checklist for systematic reviews

R-AMSTAR was used to assess the quality of included systematic reviews. This checklist is a revised version of the AMSTAR tool recommended in Developing NICE Guidelines: the manual (NICE 2014).

One reviewer undertook quality assessment of the included 15 systematic reviews and a second reviewer then independently appraised a random sample of 30% to ensure consistency. The second reviewer also checked the quality scores assigned to all other included systematic reviews to ensure consensus was gained on the overall quality ratings assigned to each systematic review included within the evidence review presented in this report. A complete version of the checklist is available in Appendix F.

R-AMSTAR uses a numerical ranking system across 11 domains with each domain receiving a score between 1 and 4. Each domain assesses a different aspect of a systematic review's methods and conduct, for example; search strategies, approaches to analysing and synthesising data, and risk of publication bias. Each systematic review is assigned a total score between 11 and 44, with higher scores indicating higher quality. In order to categorise systematic reviews as either low [-], moderate [+] or high [++] quality, total scores were converted and each review was assigned one of the following quality ratings:

Quality rating*	Total R-AMSTAR score	Description
++	36 to 44	Most items unlikely to contribute to any bias in the review; further research is very unlikely to change our confidence in the estimate of effect.
+	26 to 35	Most items may have contributed to bias in the review, but the bias was unlikely to be significant; further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
-	11 to 25	Most items may have contributed to significant bias in the systematic review, high risk of bias for the majority of evidence may decrease the confidence in the estimate of the effect, further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

*quality rating [++] is often described as high quality, [+] as moderate quality and [-] as low quality

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2.6 Data Extraction and Evidence Tables – Review of Reviews

Data from the included systematic reviews were extracted into evidence tables adapted from templates in Developing NICE Guidelines: the manual (NICE 2014). Evidence tables for the included systematic reviews can be found in Appendix C. Data were extracted from the systematic reviews for both the systematic reviews themselves (for example, details of methods and search strategies) and for relevant primary studies included within the systematic reviews (for example, study findings). The full text papers for the primary studies included in the systematic reviews were not sourced; only data available within the main text or appendices of the systematic reviews were extracted

Several of the systematic reviews that met the inclusion criteria included primary studies that did not meet the inclusion criteria for the evidence review presented in this report. For example, some systematic reviews included primary studies conducted in specific settings rather than at an organisational level, studies assessing different models of care or service delivery, interventions with no clear focus on nursing or midwifery staff, and studies conducted before 1998. A decision was taken to only extract data from primary studies that met the inclusion criteria of the evidence review presented in this report. If this was not possible (for example, synthesised findings included both relevant and non-relevant studies), data were extracted as reported in the systematic review and clearly marked in the evidence table. The evidence tables in Appendix C clearly state which studies have been extracted or discarded from each systematic review for the purposes of the evidence review presented in this report.

2.7 Evidence Synthesis – Review of Reviews

The synthesis of the systematic review level evidence is presented in a narrative format with results tables used as appropriate to display patterns, direction and significance of relationships for each review question. The top line findings are reported in the text and tables of this report and the full findings are presented in the evidence tables in Appendix C. Only data from eligible primary studies in the systematic reviews were synthesised.

Evidence statements are provided for each review question. These are brief summary statements which outline key findings from the systematic reviews and include the number of primary studies identified, the overall quality of the evidence and the direction and certainty of the results.

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3 Results – Review of Reviews

This section of the report presents the findings for all 5 review questions for the review of reviews component.

A range of outcomes and study designs are discussed in questions 1 to 5; where possible these have been grouped under 3 headings:

- findings from experimental/intervention studies
- findings from observational studies
- findings from qualitative studies.

Overall 15 systematic reviews were identified for inclusion in this evidence review. This included 3 'empty' systematic reviews that did not identify any studies for inclusion. Several overarching themes were identified when assessing the evidence base for the evidence review presented in this report:

- The included systematic reviews identified a heterogeneous range of management and organisational approaches which were assessed in relation to a diverse range of clinical outcomes, patient outcomes, staff outcomes and process or service outcomes. Findings were generally mixed and overall there was a lack of consistent, high quality evidence to support robust conclusions and recommendations.

- Reporting of primary study findings in the systematic reviews was poor. Many of the systematic reviews presented narrative results syntheses but failed to provide any numerical data to support their findings. Consequently it was sometimes difficult to interpret findings or assess the validity of certain systematic reviews' conclusions.

- It was not always clear whether interventions had been implemented or assessed at an organisational level or how the findings of the systematic review specifically applied to nurse and midwife staffing in UK settings.

- Management and organisational approaches were sometimes vaguely described and statistical data were often not provided to support the findings of the systematic reviews and their included primary studies. It should also be acknowledged that we did not source individual primary studies which may have provided more data to support systematic review-level findings and conclusions.

- While all of the included systematic reviews performed some degree of quality assessment of their included primary studies, the quality ratings were not necessarily reported or used to assess the overall strength of the included evidence.

3.1 Review Question 1

This section of the report presents the findings related to review question 1. Details of the included systematic reviews are reported in the evidence tables in Appendix C. A summary of the included systematic reviews is provided in table 1. Results are reported in tables 2, 3 and 4.

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3.1.1 Review Question

What staff and team management approaches are effective for supporting safe staffing across an organisation and how should they be implemented? For example:

- What methods for assessing or changing management approaches are effective and how reliable and valid are they?
- How often should the approaches be used?
- How do these approaches influence the delivery of safe nursing and midwifery care?

Examples of management approaches include:

- policies and models for staff and team management, such as human resource policies (for example, flexible working, staff training, study leave, bullying and harassment), governance, assurance and risk assurance systems for safe staffing, models for involving nurses and midwives in senior team or board management decisions, development and competency programmes, and safety improvement programmes
- policies and procedures for defining and implementing roles and responsibilities of people who manage nurses and midwives
- policies and procedures for defining and implementing roles and responsibilities of the board.

3.1.2 Evidence

In total, 5 systematic reviews (Conry et al. 2012, Flogren et al. 2012, Lin et al. 2014, Ruotsalainen et al. 2015, and Zingg et al. 2015) were included for this review question. Table 1 provides a summary of the included evidence for this review question. Two systematic reviews (Flogren et al. 2012, Ruotsalainen et al. 2015) were rated as high quality [++], 2 (Conry et al. 2012, Zingg et al. 2015) were rated as moderate quality [+] and 1 (Lin et al. 2014) was rated as low quality [-].

Reporting of outcomes varied across the included systematic reviews with some systematic reviews reporting quantitative results supported by statistical measures and others reporting narrative statements which did not appear to be supported by any statistical measures.

The primary studies included within the systematic reviews ranged from cluster randomised controlled trials to qualitative studies. In addition, the management approaches examined within each systematic review varied, although it is noted that there may have been some common components (for example peer support; communication and teamwork; evidence based guidelines; training and education) across several interventions. For intervention studies the management approach was categorised as:

- organisational infrastructure to promote evidence based practice
- support intervention (for example peer support) vs. no intervention or usual care
- special care (for example emotion oriented care) vs. no intervention or usual care
- changing work conditions (for example interventions aiming to reduce stress at work) vs.no intervention
- multimodal interventions vs. no intervention or usual care.

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Follow-up times for individual primary studies varied and were often not reported within the systematic review. Furthermore, the outcomes reported across the included systematic reviews also varied from generic staff outcomes such as stress to very specific patient outcomes such as blood pressure. Outcomes reported in the systematic reviews were categorised as:

- patient outcomes (for example blood pressure)
- clinical practice outcomes (for example adherence to clinical guidelines)
- staff outcomes (for example occupational stress).

Due to the differences in interventions, outcomes and follow up times reported, pooling of results from primary studies included in the systematic reviews was not considered appropriate as primary studies were not retrieved and a narrative approach was taken within the systematic reviews.

The results are summarised by study design:

- Table 2 shows the main outcomes for the 33 primary intervention studies reported in 4 systematic reviews (Flodgren et al. 2012, Conry et al. 2012, Ruotsalainen et al. 2015, Zingg et al. 2015).
- Table 3 shows the main outcomes for the 20 primary observational studies reported in 3 systematic reviews (Conry et al. 201,2 Lin et al. 2014, Zingg et al. 2015).
- Table 4 shows the main qualitative outcomes from 11 primary studies reported in 1 systematic review (Zingg et al. 2015).

Overall, there were mixed findings for management approaches across the included systematic reviews. There was some evidence from primary randomised studies which suggest that peer support and psychosocial interventions were associated with improvements in stress outcomes, while multimodal interventions for hand hygiene may improve compliance. There were mixed findings for the association between organisational exposures (such as extrinsic rewards, scheduling, interactions and support, communication and professional opportunities) and job satisfaction reported in primary observational studies. It is acknowledged that the evidence included in the systematic reviews may have limited applicability as some studies were conducted in specific disease areas or examined specific health outcomes, which may not be relevant to all organisations in which NHS nursing or midwifery care is delivered.

Please note an additional 6574 references were identified as part of ‘top-up’ searches for this review question. The search strategy and review protocol for this ‘top- up’ search are provided in Appendices A and B. The reference list for these search results is available on request for those wishing to undertake further research on this topic.

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Table 1. Summary of included evidence for review question 1 (n=5 systematic reviews)

Reference [quality]	Objectives and/or review questions	Characteristics of included primary studies	Management or organisational approach*	Outcomes*	Limitations
Flodgren et al. 2012 [++] **Last search date:** October 2011	To assess the effectiveness of organisational infrastructures in promoting evidence-based nursing.	**Number of included primary studies:** 1 **Number of relevant included primary studies:** 1/1 **Countries:** USA (n=1) **Settings:** 1 hospital in California, USA (no further details of hospital or participant characteristics provided in the included study)	Organisational infrastructure interventions. standardised evidence-based nursing procedure on nursing care provided to patients at risk of healthcare-acquired pressure ulcers (HAPUs)	**Patient outcomes** rate of healthcare-acquired pressure ulcers (HAPUs)	Unable to extrapolate effects beyond 3 months No randomised evidence included
Ruotsalainen et al. 2015 [++] **Last search date:** November 2013	To evaluate the effectiveness of work- and person-directed interventions compared to no intervention or alternative interventions in preventing stress at work in healthcare workers.	**Number of included primary studies:** 58 **Number of relevant included primary studies:** 13/58 **Countries:** UK (n=4), Netherlands (n=3), USA (n=1), Canada (n=2), Turkey (n=1), Japan (n=1), Sweden (n=1) **Settings:** Any	Organisational interventions aimed at preventing or reducing stress arising from work. These were categorised as: Support interventions Special care Changing work conditions	**Staff outcomes** Any stress related outcomes (all validated self-report questionnaires measuring occupational stress or burnout. These included: Maslach Burnout Inventory [MBI], the Nursing Stress Scale and Karasek's Job Content Questionnaire.) Psychological symptoms (anxiety and depression, such as the State-Trait Anxiety Inventory, General Health	Substantial differences in the measurement instruments of stress used between studies, and so some studies could not be synthesised together Unclear if categories of follow up time were adequate

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Reference [quality]	Objectives and/or review questions	Characteristics of included primary studies	Management or organisational approach*	Outcomes*	Limitations
		healthcare setting in which healthcare workers are officially employed or where students training to be health professionals are also doing clinical work.		Questionnaire, Beck Depression Inventory)	
Lin et al. 2014 [-] **Last search date:** No search dates reported	To explore the relationship between nurse residency programmes and new graduate nurses' job satisfaction	**Number of included primary studies:** 11 **Number of relevant included primary studies:** 11/11 **Countries:** USA (n=11) **Settings:** University-affiliated medical centres and hospitals (n=7) Magnet-designated centres (n=2) Hospitals in a healthcare system in the American Midwest (n=1) Hospitals in Las Vegas, USA (n=1)	Nurse residency programmes defined as 'programs that enhance traditional hospital orientation and are composed of structured experiences that facilitate the obtainment of clinical and professional skills and knowledge necessary for new graduate nurses to provide safe and quality care'. The following factors were examined: Extrinsic rewards (salary, benefits) Scheduling fairness Interactions and support Praise and recognition Professional opportunities Work environment Hospital system (e.g. outdated facilities and equipment)	**Staff outcomes** Job satisfaction (measured by instruments such as: the McCloskey-Mueller Satisfaction Survey [MMSS], the Halfer-Graf Job/Work Environment Nursing Satisfaction Survey, the Nurse Job Satisfaction Scale and the Work [Organizational Job] Satisfaction Scale).	Poor reporting of methods, study characteristics and link between outcomes and study quality Each study used a convenience sample Significant variability in measurement instruments of satisfaction Risk of observation bias by nurses No randomised evidence included
Zingg et al.	To identify the most	**Number of included**	Any approach or intervention	**Clinical practice outcomes**	Quality assessment tool

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Reference [quality]	Objectives and/or review questions	Characteristics of included primary studies	Management or organisational approach*	Outcomes*	Limitations
2015 [+] **Last search date:** 31st December 2012	effective and generally applicable elements of acute care infection-control and prevention programmes and to identify indicators of structure and process for monitoring.	**primary studies:** 92 **Number of relevant included primary studies:** 27/92 **Countries:** USA (n=13), UK (n=3), Canada (n=2), Finland (n=1), Netherlands (n=1), Australia (n=4), Italy (n=1), Belgium (n=1), Switzerland (n=1) **Settings:** Acute care settings	that may impact healthcare associated infection.	Adherence to infection control procedures (such as hand hygiene) Shifts of nosocomial infections Shifts in the incidence of MDRO and Clostridium difficile infection	not well established Poor reporting of link between outcomes and study quality Synthesis limited (thematic approach used) No randomised evidence included
Conry et al. 2012 [+] **Last search date:** Search parameters reported as 2000-2010	To establish what hospital based interventions have been implemented aiming to improve quality of care To make recommendation to increase the accessibility and utility of future interventions	**Number of included primary studies:** 20 **Number of relevant included primary studies:** 7/20 **Countries:** NR **Settings:** Adult general hospitals	Interpersonal quality of care interventions defined broadly as those interventions that focus on 'improving the interpersonal aspects of care for specific patient groups' Technical quality of care interventions defined broadly as those interventions that focus on 'improving medical outcomes for patients'.	**Patient outcomes** Patient falls Patient satisfaction Length of stay Other clinical outcomes (e.g. blood pressure) **Staff outcomes** Staff turnover and vacancy **Clinical practice outcomes** Use of clinical treatment, advice or diagnosis (e.g. use of aspirin, cardiac counselling) Adherence to guidelines or indicators	Heterogeneous interventions included which were broadly categorised into 2 categories and limited the synthesis No randomised evidence included

Abbreviations: NR, not reported; MDRO, multidrug resistant organism
*Management/organisational approach and outcomes are those extracted from the relevant included primary studies within the reported systematic review

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Table 2 shows the various outcomes reported across the 33 relevant primary intervention type studies which were included in 4 systematic reviews. Study design varied from cluster randomised controlled trials to before and after studies and details around methodology were often not reported.

Overall, there are mixed findings across the different management approaches that were reported often with poor reporting of quantitative results which lacked details of statistical measures. Although there were mixed findings across the several outcomes (including patient outcomes such as falls, staff outcomes such as turnover and clinical practice outcomes such as the use of aspirin), there is some evidence from randomised studies that suggest peer support groups (SMD -0.38; 95% CI -0.73 to -0.03) and psychosocial intervention training (SMD -1.23; 95% CI -2.21 to -0.26) improve stress related outcomes. The latter is also supported by findings from one controlled trial (SMD -0.38; 95% CI -0.56 to -0.20). In addition, there is also some randomised evidence to support the use of multimodal interventions to improve compliance to hand hygiene (OR 1.67; 95% CI 1.28 to 2.22).

This is supported by findings from 4 primary before and after studies and 1 primary observational study (table 3) which suggest that multimodal interventions for hand hygiene may be associated with improvements in infection or compliance. Other management approaches (including multimodal interventions or interventions aimed at changing work conditions) either did not impact significantly on outcomes, showed mixed findings or were poorly reported.

Table 2. Outcomes from primary intervention studies (n=33) reported in included systematic reviews (n=4) for review question 1

Reference of systematic review [quality]; design of primary study/ies; country of primary study	Details of comparison	Follow up	Outcome/results
Organisational infrastructure to promote evidence based practice vs. no intervention			
Flodgren et al. 2012 [++]; 1 uncontrolled before and after study re-analysed as ITS; USA	Evidence based standardised nursing procedure (before and after introduction comparison)	3 months	Hospital acquired pressure ulcer: No significant difference between pre-intervention and post intervention period (mean rate per quarter 0.7%, 95% CI -1.7 to 3.3, p=0.465, N=NR)[1]
Support intervention vs. no intervention			
Ruotsalainen et al. 2015 [++]; 1 controlled trial & 1 RCT; Canada & Turkey	Peer support to ameliorate psychosocial stressors	1 to 6 months	Any stress related outcome: pooled SMD 0.07; 95% CI -0.09 to 0.23; N=952
Ruotsalainen et al. 2015 [++]; 1 RCT; Sweden	Peer-support groups vs. no intervention	>6 months	Any stress related outcome: SMD -0.38; 95% CI -0.73 to -0.03; N=131
			Short Form Health Survey (SF-36) score[5]: MD 7.40; 95% CI 0.79 to 14.01; N=131
Support intervention vs. usual care			

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Details of comparison	Follow up	Outcome/results
Ruotsalainen et al. 2015 [++]; 1 RCT; UK	Course underlining the importance of social support as a key coping strategy when dealing with stress vs. feedback on baseline stress only	1 to 6 months	Any stress related outcome: SMD 0.53; 95% CI -0.02 to 1.08; N=53
		>6 months	General health questionnaire: MD -0.57; 95% CI -3.34 to 2.20; N=53
Special care vs. no intervention			
Ruotsalainen et al. 2015 [++]; 1 RCT; UK	'Psychosocial intervention training' aimed at better handling of behaviorally problematic patients vs. no intervention	to 1 month	Any stress related outcome: SMD -1.23; 95% CI -2.21 to -0.26; N=20
Ruotsalainen et al. 2015 [++]; 1 RCT; UK	Special care for managing symptoms in patients vs. no intervention	>6 months	Any stress related outcome: SMD 0.08; 95% CI -0.78 to 0.95; N=21
Ruotsalainen et al. 2015 [++]; 1 cluster RCT; Netherlands	Emotion-oriented care for professional caregivers in homes for elderly persons vs. no intervention	12 months	Emotional exhaustion[2]: No significant difference between intervention and control groups; N=300
			Depersonalisation: No significant difference between intervention and control groups; N=300
			Personal accomplishment: MD 1.46 (in favour of intervention group); P<0.05[3]; N=300
Special care vs. usual care			
Ruotsalainen et al. 2015 [++]; 1 RCT; Netherlands	Integrated emotion-oriented care vs. usual care	to 1 month	Any stress related outcome: SMD 0.07; 95% CI -0.60 to 0.75; N=46
		>6 months	General health questionnaire[4]: MD -4.48; 95% CI -10.46 to 1.50; N=47
Changing work conditions vs. no intervention			
Ruotsalainen et al. 2015 [++]; 1 controlled before and after study; USA	Telemedicine to decrease the work load of intensivists vs. no intervention	to 1 month (11 weeks)[13]	Any stress related outcome: No statistically significant change in the questions used to measure burnout (no data reported); N=38
Ruotsalainen et al. 2015 [++]; 1 Cluster RCT; UK	Training programme to improve work vs. no intervention	to 1 month	Occupational stress indicators: no effect (no data reported); N=98
Ruotsalainen et al. 2015 [++]; 2 Cluster RCTs; Netherlands & Japan	Intensive participatory programme of improving psychosocial working conditions vs. no intervention	1 to 6 months	Any stress related outcome: pooled SMD -0.12; 95% CI -0.30 to 0.05; N=525
Ruotsalainen et al. 2015 [++]; 1 controlled trial; Canada	Intervention programme aimed at reducing psychosocial stressors at work vs. no intervention	>6 months (3 years)[13]	Any stress related outcome: SMD -0.38; 95% CI -0.56 to -0.20; N=488
Multimodal interventions vs. no intervention			
Conry et al. 2012 [+]; 1 phased	Interpersonal intervention to enhance teamwork and staff	NR	Patient falls: significantly lower fall rate (no data reported); N=55

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Details of comparison	Follow up	Outcome/results
design study; NR	engagement (including focus groups to assess nature of team work and education needs followed by training program) vs. no intervention		Staff turnover and vacancy: lower turnover and vacancy levels (no data reported); N=55
			Patient satisfaction: No significant association; N=55
Conry et al. 2012 [+]; 1 phased design study; NR	Technical multidisciplinary leadership intervention (analysed clinical and operational processes & revised and developed tools)	12 months	Discharge teaching: dramatic trend upwards (no data reported); N=NR
			Smoking cessation counselling: dramatic trend upwards (no data reported); N=NR
			Use of angiotensin converting enzyme inhibitor: improvements (no data reported); N=NR
			Use of left ventricular ejection fraction measurement: improvements (no data reported); N=NR
Conry et al. 2012 [+]; 1 before and after study; NR	Technical multi improvement program (including clinical guidelines, reminder tools, education interventions, 6 monthly performance feedback, facilitation of a multidisciplinary team review of work practices)	NR	Proportion of eligible patients undergoing timely ECG or prescribed angiotensin converting enzyme inhibitors and lipid lowering agents: increases (no data reported); N=1594
			Number of patients receiving cardiac counselling and referred to cardiac rehabilitation: increases (no data reported); N=1594
Conry et al. 2012 [+]; 1 before and after study; NR	Technical 'Guidelines applied in practice' intervention (including presentation, customised guideline orientated tools to facilitate adherence to key quality indicators)	NR	Use of aspirin at admission: No significant association (no data reported); N=914[6]
			Use of aspirin at discharge: significant increase (no data reported); N=914[6]
			Use of ACE inhibitors at discharge: No significant association (no data reported); N=914[6]
			Documentation of smoking cessation: No significant association (no data reported); N=914[6]
Conry et al. 2012 [+]; 1 before and after study; NR	Interventions included feedback of performance data, dissemination of evidence based pathway for pneumonia and sharing of implementation experiences)	NR	Primary outcomes (including antibiotic administration within 8 hours, oxygenation assessment within 24 hours, length of stay): improvements (no data reported). Reduction in length of stay from 7 to 5 days (no further details reported); N=1146[8]
			Other outcomes (including blood culture collection within 24 hours and before administration of antibiotics, 30 day mortality and 30 day readmission rates): No significant changes (no data

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Details of comparison	Follow up	Outcome/results
			reported); N=1146[8]
Conry et al. 2012 [+]; 1 before and after study; NR	Multiple interventions (including nursing education, patient education, provider education about hypertension guidelines and provider education about peer review performance goals with audit and performance feedback)	NR	Blood pressure: absolute improvement of 4.2%; N=NR
Zingg et al. 2015 [+]; 1 RCT; Italy	Standardisation of audits (auditing and personal feedback vs. standard group)	NR	Compliance for catheter insertion: significant increase (p=0.05) among audit group vs. standard group[9]
Zingg et al. 2015 [+]; 1 before and after study; Belgium	Multimodal strategy to promote hand hygiene (promotions campaigns, reminders in wards, educational sessions, increased patient awareness and audit with performance feedback)	NR	Hand hygiene use: after 4th campaign 62.3% vs. 72.9% (no further data reported)[10]; N=168922
Zingg et al. 2015 [+]; 1 cluster RCT; UK	Hand hygiene intervention based on "goal and control" theories (direct and repeated feedback and positive reinforcement)	NR	Compliance: OR 1.67 (95% CI 1.28 to 2.22) p<0.001; N=NR[10]
Zingg et al. 2015 [+]; 1 before and after study; USA	Multimodal intervention for hand hygiene (including posters aimed at employees, staff culture, and a range of interventions)	26 months	Compliance: 49% vs. 98% (sustained at >90% for 26 months)[10]
			Hospital acquired infection from MRSA: 0.52/1000 patient-days to 0.24/1000 patient days (no further data reported)[10]
Zingg et al. 2015 [+]; 1 before and after study; USA	Multimodal intervention (addresses cognitive behavioural factors and focussed on behavioural modification through positive reinforce and annual changing incentives)	6 years	Compliance with hand hygiene: 19% to 41% at baseline vs. 49% - 81% at 6 years, p<0.05[3]; N=36123 hand hygiene opportunities[10]
Zingg et al. 2015 [+]; 1 before and after study; Australia	Multimodal intervention for hand hygiene (education, staff champions, local leaders, engaging patients and families, performance feedback)	NR	Compliance with hand hygiene: 58% at the run-in period vs. 61% post campaign (p<0.001); N=7747 hand hygiene opportunities[10]
Zingg et al. 2015 [+]; 1 before and after study; Australia		NR	MRSA non-ICU sterile site infections: 0.6/10,000 bed-days vs. 0.45/10,000 bed-days, p=0.027[10]
Zingg et al. 2015 [+]; 1 before and after study; Switzerland	Multimodal intervention for hand hygiene (training programmes, prepared by health care workers, and a	NR	Catheter related blood stream infection rates: adjusted[11] HR 5.08 (95% CI 2.34 to 11.0)[12]; N=396 nursing staff & 34 medical staff[10]

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Details of comparison	Follow up	Outcome/results
	teaching strategy)		
Zingg et al. 2015 [+]; 1 before and after study; USA	Electronic reminder (in form of a pop-up window to prescribe isolation if patient isolation is needed for MRSA)	NR	Compliance with isolation order: 33% vs. 89%, P<0.001; N=NR[10]

Abbreviations: ACE inhibitor, angiotensin-converting-enzyme inhibitor; CI, confidence interval; ECG, electrocardiogram; HR, hazard ratio; ICU, intensive care unit; ITS, interrupted time series; MD, mean difference; MRSA, Methicillin-resistant Staphylococcus aureus; NR, not reported; OR, odds ratio; SMD, standardised mean difference.
NB: the outcome/results data extracted for all included systematic reviews relate to results from primary studies that met the inclusion criteria (i.e. studies conducted in OECD countries after 1998). Unless stated otherwise, lower scores relate to improved outcomes
[1] Before the intervention there was a statistically significant (P = 0.046) decrease in mean HAPU rate by 1.1% per quarter. Given the small percentages post intervention it was not possible to extrapolate effects beyond 3 months
[2] Measured by subscales of the Maslach Burnout Inventory (range 0 - 48)
[3] p-value assumed to be <0.05 as reported as statistically significant (no further data reported)
[4] 12 item general health questionnaire (GHQ) used but it is unclear what scoring method is used: GHQ method of scoring reports a maximum score of 12 while Likert scale reports a maximum score of 36. Both scoring methods assume that lower scores indicate better mental health
[5] Higher scores on the short form health survey (SF-36) relate to better quality of life
[6] The paper reported patient at baseline (n=735) and patients at remeasurement (n=914)
[7] The paper reported n=1013 before the intervention and n=1081 after the intervention
[8] The paper reported n=1242 patients at baseline and n=1146 at follow up
[9] These findings were used in Zingg et al. (2015) to support the following key component for preventing healthcare associated infection: “organising audits as a standardised (scored) and systematic review of practice with timely feedback”
[10] these findings were used in Zingg et al. (2015) to support the following key component for preventing healthcare associated infection: “implementing infection control programmes following a multimodal strategy, including tools such as bundles and checklists”
[11] several patient characteristics were adjusted for (no further details reported)
[12] This finding is assumed to support reduced rates of infection (3.9/1000 to 1.0/1000) so it is assumed the outcome of interest is not having infection
[13] The systematic review categorised follow up time into the following: up to 1 month, 1-6 months or >6 months. However, the individual study reports a specific follow up period.

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Table 3 shows the various outcomes reported across the 20 relevant primary observational studies which were included in 3 systematic reviews. The included primary studies varied in study design from cross sectional studies to mixed method approaches, although there was often poor reporting of study designs and methodologies. It is important to note that findings from cross sectional studies cannot be used to imply a causal relationship between management factors and outcomes, therefore conclusions around effectiveness are not possible.

Generally, there are mixed findings for the association between several management approaches (such as extrinsic rewards, scheduling, interactions and support, communication, praise and recognition and professional opportunities) and job satisfaction. One primary cross-sectional study found that receiving training was significantly associated with compliance with respiratory precautions (OR 2.5, 95% CI 1.1 to 5.9). There was also some evidence from 3 primary observational studies to suggest that increased workload or longer work hours was significantly associated with increased infection. Other management approaches either did not impact significantly on job satisfaction, showed mixed findings or were poorly reported.

Table 3. Outcomes from primary observational studies (n=20) reported in included systematic reviews (n=3) for review question 1

Reference of systematic review [quality]; design of primary study/ies; country of primary study	Organisational details	Management exposure of interest	Outcomes/results [follow up]
Lin et al. 2014* [-]; 2 non experimental designs; USA	Nurse residency programs (enhance traditional hospital orientation for new graduate nurses to provide safe and quality care)	Extrinsic rewards (Vacation, salary, benefits)	Job satisfaction: No significant association; N=142 [1 year]
Lin et al. 2014* [-]; 1 non experimental design; USA			Job satisfaction: significant increase in satisfaction with extrinsic rewards[1]; N=655 [1 year]
Lin et al. 2014* [-]; 1 non experimental design; USA			Satisfaction with pay: Decreased satisfaction (significance not reported); N=>6000 [5 years[3]]
Lin et al. 2014* [-]; 4 non experimental designs; USA	Nurse residency programs (enhance traditional hospital orientation for new graduate nurses to provide safe and quality care)	Scheduling (fairness)	Job satisfaction: No significant association[1]; N=1476 [1 year]
Lin et al. 2014* [-]; 1 non experimental design; USA			Job satisfaction: significant decrease; N=90 [1 year]
Lin et al. 2014* [-]; 3 non experimental designs; USA	Nurse residency programs (enhance traditional hospital orientation for new graduate nurses to provide safe and quality care)	Interactions and support (professional RN interactions including support from RN peers, mentors, preceptors, teamwork, respect)	Job satisfaction: No significant association; N=1671 [1 year]
Lin et al. 2014* [-]; 2 non experimental designs; USA			Job satisfaction: significant increases[1]; N=710 [1 year]
Lin et al. 2014* [-]; 4 non experimental designs; USA			Job satisfaction: increase (significant not reported); N=>6145 [1 to 5 years]

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Organisational details	Management exposure of interest	Outcomes/results [follow up]
Lin et al. 2014* [-]; 5 non experimental designs; USA	Nurse residency programs (enhance traditional hospital orientation for new graduate nurses to provide safe and quality care)	Communication and interaction with non-RN team members including physicians, patients and families	Job satisfaction: significant increase; N=2436 [1 year]
Lin et al. 2014* [-]; 2 non experimental designs; USA			Job satisfaction: increase (significant not reported); N>6090 [1 to 5 years]
Lin et al. 2014* [-]; 2 non experimental designs; USA	Nurse residency programs (enhance traditional hospital orientation for new graduate nurses to provide safe and quality care)	Praise and recognition from staff (including supervisors, superiors and peers)	Job satisfaction: No significant association[1]; N=1334; [1 year]
Lin et al. 2014* [-]; 1 non experimental designs; USA			Job satisfaction: significant decrease; N=111 [1 year]
Lin et al. 2014* [-]; 2 non experimental designs; USA	Nurse residency programs (enhance traditional hospital orientation for new graduate nurses to provide safe and quality care)	Professional opportunities for advancement (such as interactions with faculty, participation in research)	Job satisfaction: No significant association[1]; N=710 [1 year]
Lin et al. 2014* [-]; 1 non experimental design; USA			Job satisfaction: significant decrease; N=111 [1 year]
Lin et al. 2014* [-]; 1 non experimental design; USA			Job satisfaction: significant increase[1]; N=655 [1 year]
Lin et al. 2014* [-]; 1 non experimental design; USA			Job satisfaction: increase (significant not reported); N>6000 [1 year]
Conry et al. 2012 [+]; 1 time series cohort; NR	Multifactorial intervention to improve the quality, efficiency and patient understanding of care for community acquired pneumonia	Multifactorial intervention (including evidence based treatment guidelines developed by multidisciplinary team of opinion leaders, educational sessions)	Adherence to guideline recommended antimicrobial therapy: increased (no data reported); N=1081[7]
			Inappropriate discharge (prior to becoming clinically stable): borderline decreases (no data reported); N=1081[7]
			Other targeted indicators (time to first dose antibiotics, proportion receiving antibiotics within 8 hours, timely switch to oral antibiotics, timely discharge, length of stay, patient education outcomes): No improvements (no data reported); N=1081[7]
Zingg et al. 2015 [+]; 1 Cross sectional study; USA	Worksite characteristics such as receiving training (no	Receiving training	Compliance with respiratory precautions[2]: OR 2.5,

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Organisational details	Management exposure of interest	Outcomes/results [follow up]
	further details reported)		95% CI 1.1 to 5.9; N=273[4]
Zingg et al. 2015 [+]; 1 mixed methods study (prevalence study & questionnaire); Finland	Work occupancy and workload	Long work hours (workload >8.45/day)	Hospital acquired infection: OR 2.74 (95% CI: 1.04 to 7.04); N=1092 patients & 1159 staff[5]
Zingg et al. 2015 [+]; 1 uncontrolled case study; Netherlands		Nursing workload	Adherence to hand hygiene: correlation coefficient -0.38, p=0.02; N=777[5]
Zingg et al. 2015 [+]; 1 case-control study; USA		Nurse to patient ratio	Blood stream infection (cases): pool nurse to patient ratios higher for cases then controls (median 3.2 vs. 2.8, p<0.001); N=127 (28 cases)[5]
Zingg et al. 2015 [+]; 1 cohort study; USA		Float nurse undertakes central venous catheter care >60% of time	Central line associated bloodstream infections: OR 2.75 (95% CI 1.45 to 5.22); N=4535[5]
Zingg et al. 2015 [+]; 1 uncontrolled cohort study; USA	Multimodal intervention to promote hand hygiene	Multimodal intervention (leadership accountability, surveillance, feedback, hand rub availability, education and training and emphasized marketing and communication)	Compliance: 41% to 87%, p<0.01; [4 years]; N=500[6]
			Healthcare associated infection: 4.8 to 3.3 per 1000 patient days; [4 years]; N=500[6]
Zingg et al. 2015 [+]; 1 prospective cohort study; Australia		Multimodal intervention (principle of practice development, solution focused coaching and models of behaviour change)	Compliance to hand hygiene: 70% to 80.1%; [1 year]; N=11247 opportunities for hand hygiene[6]
Zingg et al. 2015 [+]; 1 mixed methods study (including focus groups); USA		Hand hygiene intervention (involving frontline workers designing programme)	Compliance to hand hygiene: 20% to 55% (no further data reported); [NR] N=NR[6]

Abbreviations: CI, confidence interval; NR, not reported; OR, odds ratio; RN, registered nurse.
*The systematic review by Lin et al. (2014) reports narrative statements at different time points for included studies. The statements extracted into this table relate only to the latest time point and therefore do not describe trends at earlier time points. However, it should be noted that time points reported in Lin et al. (2014) are unclear and therefore may have varied across studies. See full evidence tables for narrative statements relating to earlier time points.
[1] The studies reported varying results at earlier time points (e.g. significant results may have been observed initially but no significant association observed at a later time) however, the result presented in the table relates to the latest time point.
[2] It is assumed that the measure of effect reported relates to nurse professionals although this is unclear in Lin et al. (2014)
[3] Job satisfaction was measured at 12, 24 and 60 months (5 years)
[4] These findings were used in Zingg et al. (2015) to support the following key component for preventing healthcare associated infection: "A positive organisational culture by fostering working relationships and

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Organisational details	Management exposure of interest	Outcomes/results [follow up]
communication across units and staff groups" and "Education and training involves frontline staff and is team and task oriented" [5] These findings were used in Zingg et al. (2015) to support the following key component for preventing healthcare associated infection: "Ward occupancy must not exceed the capacity for which it is designed and staffed; staffing and workload of frontline healthcare workers must be adapted to acuity of care, and the number of pool or agency nurses and physicians used kept to a minimum" [6] These findings were used in Zingg et al. (2015) to support the following key component for preventing healthcare associated infection: "implementing infection control programmes following a multimodal strategy, including tools such as bundles and checklists" [7] The paper reported n=1013 before the intervention and n=1081 after the intervention			

Table 4 shows the various outcomes reported across the 11 studies from 1 systematic review which reported qualitative outcomes. It is noted that while some study designs were reported to be observational (for example cohort or cross-sectional), the findings were generally qualitative in nature and focused on knowledge and perceptions, therefore these were separated from the quantitative results. It is important to note that these findings cannot be used to establish effectiveness of the methods used, but may be useful to gain insight into the subjective experiences of those involved.

The included systematic review (Zingg et al. 2015) focused on identifying hospital organisation, management and structures to prevent health care associated infection. Overall, the findings suggest that management factors (such as knowledge, motivation, external environment, professional responsibilities, leadership, management support and staff engagement) impacted on various outcomes (compliance with guidelines, perceptions of control, individual knowledge of infection prevention and perceptions of success). The finding from the systematic review was used to identify key components for effective implementation of infection control programmes in hospitals and this process was supported by an expert group.

Table 4. Qualitative outcomes from primary studies (n=11) reported in the included systematic review (n=1) for review question 1

Reference of systematic review [quality]; design of primary study/ies; country of primary study	Findings of included studies	Key implementation component identified by systematic review*
Zingg et al. 2015 [+]; 1 uncontrolled before and after study; USA	1158 healthcare workers in 40 US hospitals stated that they know about the update of national guideline on hand hygiene, but had been implemented in less than half of hospitals. N=1158	Use of guidelines in combination with practical education and training
Zingg et al. 2015 [+]; 1 qualitative study; Australia	individual experience is perceived to be more important for infection prevention	Education and training involves frontline staff and is team and task oriented

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Findings of included studies	Key implementation component identified by systematic review*
Zingg et al. 2015 [+]; 1 qualitative study; USA	A well-placed strategy champion is helpful to implement a new technology, but more than one champion as needed when improvements required behavioural change	Identifying and engaging champions in the promotion of intervention strategies
Zingg et al. 2015 [+]; 1 focus group study; Canada	Factors influencing compliance with hand hygiene guidelines include knowledge and beliefs, motivation (personal protection), external environment and professional responsibility. Strategies to improve adherence include: • Education on how to manage workload with guideline adherence. • Addressing contaminated hospital equipment. • Encouraging physicians to act as role models.	Implementing infection control programs following a multimodal strategy, including tools such as bundles and checklists developed by multidisciplinary teams, and taking into account local conditions[1]
Zingg et al. 2015 [+]; 1 Interviews; USA	Successful leaders: • are solution oriented • focus on cultivating a culture of clinical excellence • inspire staff • think strategically while acting locally.	A positive organisational culture by fostering working relationships and communication across units and staff groups[1]
Zingg et al. 2015 [+]; 1 Interviews; UK	Lack of management support provokes perception of non-control in situations of high workload	
Zingg et al. 2015 [+]; 1 cross sectional study; USA	Staff engagement, overwhelmed/stress-chaos, and hospital leadership were found to be associated with individual health care worker knowledge, attitudes and self-reported practices regarding MRSA prevention (no further data reported)	
Zingg et al. 2015 [+]; 1 cross sectional study; UK	Success of intervention programmes is perceived differently by different professional groups, and should be taken into account in the design of infection control initiatives. Frontline staff perceived a larger improvement on timeliness of care delivery (t=2.943, p=0.004), while managers perceived larger improvement on the culture within the organisation for safe, effective and reliable care (t=-2.454, p=0.014)	
Zingg et al. 2015 [+]; 1 cross sectional study; USA	Receiving training and instructional feedback from supervisors and management support for implement safe work practices are perceived by health care workers to improve adherence to recommended care practices	
Zingg et al. 2015 [+]; 1	Adherence to guidelines is affected by knowledge, belief, notification and	

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Findings of included studies	Key implementation component identified by systematic review*
focus group study; Canada	professional responsibility	
Zingg et al. 2015 [+]; 1 uncontrolled cohort study; USA	Peer pressure and role models are also important in hand hygiene compliance	
* Zingg et al. (2015) used the findings from the included studies to identify 10 key components to reduce healthcare associated infections. [1] This key component is also supported by some quantitative data presented in tables 2 and 3 above.		

3.1.3 Evidence Statements

Inconsistent evidence from 33 primary intervention studies reported in 4 systematic reviews (Flodgren et al. 2012 [++], Conry et al. 2012 [+], Ruotsalainen et al. 2015 [++], Zingg et al. 2015 [+]) showed mixed findings for the different interventions and outcomes reported. In general, reporting of outcomes was often poor and study designs varied from cluster RCTs to uncontrolled before and after studies. There is some evidence from:

- 2 randomised studies which suggest that peer support interventions (SMD -0.38, 95% CI -0.73 to -0.03) and psychosocial interventions (SMD -1.23; 95% CI -2.21 to -0.26) may improve stress related outcomes after 6 months and 1 month respectively. The latter finding is also supported by findings from a controlled trial (SMD -0.38; 95% CI -0.56 to -0.20) after 3 years.

- 1 cluster RCT to suggest that multimodal interventions for hand hygiene may improve compliance (OR 1.67; 95% CI 1.28 to 2.22). This is also supported by findings from 4 before and after studies and 1 observational study which showed statistically significant improvements in compliance or infections (all $p<0.05$).

Other management approaches either did not impact significantly on outcomes (including patient, clinical practice and staff measures) showed mixed findings or were poorly reported. Overall, the evidence may not be applicable as some studies were conducted in specific disease areas or examined specific health outcomes which may not be relevant to all organisations in which NHS nursing or midwifery care is delivered.

Evidence from 20 primary observational studies reported in 3 systematic reviews (Conry et al. 2012 [+], Lin et al. 2014 [-], Zingg et al. 2015 [+]) showed mixed findings for the association between organisational exposures (extrinsic rewards, scheduling, interactions and support, communication, praise and recognition, professional opportunities and training) and job satisfaction. There is some evidence from:

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- 1 cross sectional study to suggest that receiving training may be associated with improved compliance with respiratory precautions (OR 2.5; 95% CI 1.1 to 5.9).

- 3 observational studies to suggest that higher workloads or longer work hours may be associated with increased infection (all $p<0.05$).

Other management approaches either did not impact significantly on job satisfaction, showed mixed findings or were poorly reported. In general, reporting of outcomes and study design was often poor and conclusions around effectiveness are limited. Overall, the evidence may be partially applicable as only one study reported specific health outcomes which may not be relevant to all organisations in which NHS nursing or midwifery care is delivered.

Evidence from 11 primary studies reporting qualitative outcomes in 1 systematic review (Zingg et al. 2015 [+]) suggests that management factors (such as knowledge, motivation, external environment, professional responsibilities, leadership, management support and staff engagement) were associated with various outcomes (compliance with guidelines, perceptions of control, individual knowledge of infection prevention and perceptions of success). The systematic review concluded that use of guidelines, team and task oriented education and training, the use of champions to promote intervention, multimodal strategies and a positive organisational culture were key components for implementing infection prevention programs. Overall, the evidence may not be applicable as some studies were conducted in specific disease areas or examined specific health outcomes which may not be relevant to all organisations in which NHS nursing or midwifery care is delivered.

No economic outcomes were identified for this review question.

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3.2 Review Question 2

This section of the report presents the findings related to review question 2.

3.2.1 Review Question

What management systems are effective for supporting safe staffing across an organisation and how should they be implemented? For example:

- What methods for assessing or changing management systems are effective and how reliable and valid are they?
- How often should the approaches be used?
- How do these approaches influence the delivery of safe nursing and midwifery care?

Examples of management systems used across organisations include:

- models for handling information on NHS patients and people using NHS services (such as Patient Administration System [PAS], Central Booking Service [CBS])
- systems for managing workflow
- workforce planning systems (for example, workforce profiling and monitoring), work allocation and rostering.

3.2.2 Evidence

No systematic review-level evidence was identified regarding the effectiveness of management systems to support safe staffing. Supplementary searches for relevant primary studies located 14,227 references. Title and abstract screening resulted in 313 references being identified for full text assessment. The search strategy and review protocol for this 'gap' search are provided in Appendices A and B. A reference list of the references which require retrieval and full text screening is provided in Appendix D, which may be useful for those wishing to undertake further research on this topic.

3.2.3 Evidence Statements

No systematic review level evidence was identified for this review question.

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3.3 Review Question 3

This section of the report presents the findings related to review question 3. Details of the included systematic reviews are reported in the evidence tables in Appendix C. A summary of the included systematic reviews is provided in table 5. Results are reported in table 6.

3.3.1 Review Question

What approaches for addressing risk to patient care posed by variation in demand for services, variation in patient or service user needs, or deficits in nursing and midwifery staff levels and skill mix across an organisation are effective? How should they be implemented? For example:

- What methods for assessing or changing approaches for addressing risk to patient care posed by variation in demand for services, variation in patient or service user needs, or deficits in nursing and midwifery staff levels and skill mix are effective and how reliable and valid are they?
- How often should the approaches be used?
- How do these approaches influence the delivery of safe nursing and midwifery care?

Examples of approaches for organisations include:

- capacity and contingency planning policies and procedures
- policies and procedures for managing the delivery of safe care, such as escalation and downgrading care procedures
- systems for addressing risk to patient care posed by variation in demand for services, variation in patient or service user needs (including provision of specialised services) or deficits in nursing and midwifery staff levels
- policies and procedures for managing nursing and midwifery vacancies and temporary staffing, supervision arrangements for temporary staff.

3.3.2 Evidence

Overall, 3 systematic reviews (Salt et al. 2008, Webster & Flint 2014, Grobler et al. 2015) were identified as relevant to this review question. Table 5 provides a summary of the included evidence for this review question. Two of the systematic reviews (Webster & Flint 2014, Grobler et al. 2015) were rated as high quality [++] however they did not identify any relevant primary studies for inclusion in their review therefore no further results are presented in this report. Webster & Flint (2014) aimed to assess the effectiveness of various exit interview strategies in decreasing turnover rates among healthcare professionals while Grobler et al. (2015) aimed to assess interventions for increasing the proportion of health professionals practicing in rural and other underserved areas. Grobler et al. (2015) identified 1 primary study which was conducted in a non-OECD country and did not meet the inclusion criteria while Webster & Flint (2014) did not identify any primary studies.

The included systematic review (Salt et al. 2008) was rated as low quality [-]. Salt et al. (2008) reported quantitative results however these were not supported by any statistical measures. This systematic review also included some non-comparative primary studies, such as case studies. Results are not presented for primary studies unless some comparison was reported (for example, 1 case study was compared to results reported in

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the literature). No randomised controlled trials were included. The main comparison examined in this systematic review was a nursing retention strategy compared with a control. Retention strategies were categorised as:

- Preceptor program model (new graduate nurses focus) which is exclusively structured and measured with new graduate nurses as the central focus. Preceptors were generally identified as one or more experienced registered nurses who provide one to one guidance during orientation.
- Preceptor program model (preceptor focus) which is designed to support registered nurses to work in the preceptor capacity. Registered nurses were offered educational training about preceptor role and a monetary incentive.
- Needs based orientation and/or speciality training program which is designed to develop skills in specific clinical areas and includes several different methods of education.
- Externship program which was designed to offer student nurses completing their last year of training and employment to develop clinical competencies.

The main outcome reported in the systematic review was retention of nursing staff as a percentage. Results were also reported in subgroups by the length of the retention strategy, which was categorised as less than 3 months, 3 to 6 months or 6 to 12 months.

Due to the differences in study design and method of outcome reporting, pooling of studies was not considered appropriate as primary studies included in the systematic reviews were not retrieved and a narrative approach was taken. The results are summarised by study design with table 6 showing retention outcomes for the 7 primary studies reported.

Overall, the included systematic review showed some general trends to suggest that the use of any retention strategy may be associated with higher retention of nursing staff. However, these findings are not supported by any statistical measures and therefore may demonstrate chance findings. It was unclear whether there was an association between the duration of intervention and retention. The included systematic review focused on the use of retention strategies and no evidence was identified that examined other approaches to address risk to patient care. Furthermore, all included primary studies were conducted in the USA, where employment terms and conditions differ compared with NHS organisations in the UK.

Please note an additional 8967 references were identified as part of ‘top-up’ searches for this review question. The search strategy and review protocol for this ‘top- up’ search are provided in Appendices A and B. The reference list for these search results is available on request for those wishing to undertake further research on this topic.

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Table 5. Summary of included evidence for review question 3 (n=3 systematic reviews)

Reference [quality]	Objectives and/or review questions	Characteristics of included studies	Management or organisational approach*	Outcomes*	Limitations
Webster & Flint 2014 [++] **Last search date:** October 2012	To determine the effectiveness of various exit interview strategies in decreasing turnover rates amongst healthcare professionals	**Number of included primary studies:** 0 **Number of relevant included primary studies:** 0 **Countries:** N/A **Settings/participants:** Healthcare professionals (including medical, nursing and allied health) who have undergone any type of exit interview from a healthcare organisation.	Any form of exit interview undertaken at the voluntary cessation of employment or at a prescribed time following departure from the organisation. This included face-to-face exit interviews, telephone exit interviews, self-completed exit interview surveys and mailed exit interview surveys.	**Primary outcome** Turnover rate (defined as the proportion of the population that leaves the organisation in any given year or over the period of the study). **Secondary outcomes** Organisational change as a result of the exit interview process (e.g. evidence of policy change) Cost incurred as a result of voluntary cessation of an employee (e.g. productivity losses incurred when the new employee is training and orientating, or any other costs reported by the author) Absenteeism (days of sickness absence during the study period) Organisational job satisfaction measured by any validated job satisfaction instrument.	N/A
Grobler et al. 2015 [++]	To assess the effectiveness of interventions aimed at increasing the proportion of health professionals working in rural and other underserved areas	**Number of included primary studies:** 1 **Number of relevant included primary studies:** 0/1 **Countries:** N/A **Settings/participants:**	Educational interventions Financial interventions Regulatory strategies Personal and professional support strategies	**Primary outcome** Proportion of healthcare workers who initially choose to work in a rural or urban underserved areas as consequence of the intervention (retention) Proportion of healthcare workers who continue to work in a rural or urban underserved areas as	N/A

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Reference [quality]	Objectives and/or review questions	Characteristics of included studies	Management or organisational approach*	Outcomes*	Limitations
		All qualified healthcare professionals		consequence of the intervention **Secondary outcomes** Patient satisfaction with care Impact on health status of participants	
Salt et al. 2008 [-] **Last search date:** January 2007	What is the effect of organisational interventions aimed at retaining new graduate nurses (NGNs)?	**Number of included primary studies:** 16 **Number of relevant included primary studies:** 14/16 **Countries:** USA (n=14) **Settings:** NR	A retention strategy defined as 'a way to engage NGNs to continue service within a unit, hospital, or organisation.'	Type of retention strategy Length of retention strategy	Quantitative results not supported by statistical measures No randomised evidence included

Abbreviations: NR, not reported
*Management/organisational approach and outcomes are those extracted from the relevant included primary studies within the reported systematic review

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Table 6 shows the retention outcomes reported across the 7 primary studies which were reported in the included systematic review (Salt et al. 2008). Study designs differed and ranged from before and after studies to case studies. It is important to note that no primary randomised studies were included in the systematic review and so conclusions about effectiveness are limited. Overall, there was an observed trend from comparative studies to suggest that the use of any retention strategy (NGN focus, preceptor focus, needs based orientation/speciality and externship) is associated with increased retention of new graduate nurses, however no statistical differences are reported. When looking at primary comparative studies alone, it is unclear whether there is an association between the duration that the strategy was used and retention of nursing staff. This is due to the number of primary comparative studies included within each category (N=2 for less than 3 months, N=4 for 3 to 6 months and N=1 for 6 to 12 month duration), poor reporting of outcomes and the lack of associated measures of precision.

Table 6. Nurse retention outcomes from primary studies (n=7) reported in 1 systematic review

Reference of systematic review [quality]; design of primary study/ies; country of primary study	Details of comparison	Follow up [duration of intervention]	Outcome/results
Preceptor program model (NGN focus) vs. control group			
Salt et al. 2008 [-]; 1 non-randomised study; USA	Preceptor program (focus on new graduate nurses) vs. control group	1 year [3-6 months]	86% retention of new graduate nurses in intervention group vs. 63% in control group (no further data reported)
Salt et al. 2008 [-]; 1 before and after study; USA	Preceptor program (focus on new graduate nurses) vs. control group	1 year [less than 3 months]	96% retention of new nurse hires vs. 46% before implementation of program (no further data reported)
Salt et al. 2008 [-]; 1 case study; USA	Preceptor program (focus on new graduate nurses) vs. results reported in literature	Program completion (no further details reported) [6-12 months]	92% retention of new graduate nurses vs. 60 to 80% reported in literature
Preceptor program model (preceptor focus) vs. control group			
Salt et al. 2008 [-]; 1 before and after study; USA	Preceptor program (focus preceptor) vs. control group	1 year [less than 3 months]	96% retention of new nurse hires vs. 46% before implementation of program (no further data reported)
Salt et al. 2008 [-]; 1 case study; USA	Preceptor program (focus preceptor) vs. results reported in literature	1 year [less than 3 months]	73% and 74% of new graduate nurses vs. 35 to 60% reported in literature
Needs based orientation program model and/or speciality training vs. control group			
Salt et al. 2008 [-]; 1 before and after study; USA	Needs based orientation program/specialty training vs. control	1 year [less than 3 months]	96% retention of new nurse hires vs. 46% before implementation of program (no further data reported)
Salt et al. 2008 [-]; 1 non-randomised study; USA	Needs based orientation program/specialty training vs. control	1 year [3-6 months]	90% retention in intervention group vs. 60% in control group (no further data reported)
Salt et al.2008	Needs based	NR [3-6 months]	82% retention of new graduate nurses

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Details of comparison	Follow up [duration of intervention]	Outcome/results
[-]; 1 case study; USA	orientation program/specialty training vs. control (float pool)		within facility vs. 69% within float pool (no further data reported)
Salt et al. 2008 [-]; 1 case study; USA	Needs based orientation program/specialty training vs. control	Program completion (no further details reported) [6-12 months]	92% of new graduate nurses vs. 60 to 80% reported in literature (no further data reported)
Externship vs. control group			
Salt et al. 2008 [-]; 1 before and after study; USA	Externship vs. control	2 years [3-6 months]	50% retention of participants vs. 32% of non-participants (no further data reported)
Abbreviations: NGN, new graduated nurse; NR, not reported			

3.3.3 Evidence Statements

Evidence from 7 primary observational studies reported in 1 systematic review (Salt et al. 2008 [-]), showed general trends that the use any retention strategy (NGN focus, preceptor focus, needs based orientation/speciality and externship) may be associated with higher retention of nursing staff. However, these findings were not supported by any statistical measures; therefore conclusions around effectiveness cannot be made. It is also unclear if there is any association between the duration that the strategy was used and retention of nursing staff. Overall, the evidence included may only be partially applicable as all included primary studies were conducted in USA, where employment terms and conditions may differ to organisations in the UK where NHS nursing or midwifery care is delivered.

One high quality [++] systematic review (Grobler et al. 2015) found no relevant primary studies that examined the effectiveness of interventions to increase the proportion of health professionals practicing in rural and other underserved areas.

One high quality [++] systematic review (Webster & Flint 2014) found no primary studies conducted in OECD countries that examined the effectiveness of various exit interview strategies in decreasing turnover rates among healthcare professionals.

No economic outcomes were identified for this review question.

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3.4 Review Question 4

This section of the report presents the findings related to review question 4. Details of the included systematic reviews are reported in the evidence tables in Appendix C. A summary of the included systematic reviews is provided in table 7. Results are reported in tables 8 and 9.

3.4.1 Review Question

What organisational approaches are effective for assessing and changing organisational culture and support safe staffing for nursing and midwifery across an organisation? How should these approaches be implemented? For example:

- What methods for assessing or changing organisational culture are effective and how reliable and valid are they?
- How often should the approaches be used?
- How do these approaches influence the delivery of safe nursing and midwifery care?

Examples of organisational approaches include:

- organisational development and improvement programmes
- staff empowerment programmes.

3.4.2 Evidence

Five systematic reviews were identified to address this review question (Hill et al. 2011, Li & Porock 2014, Parmelli et al. 2011, Shier et al. 2014, and Weaver et al. 2013). Table 7 provides a summary of the included studies for this review question.

One systematic review (Parmelli et al. 2011) sought to assess the effectiveness of strategies to change organisational culture to improve healthcare performance in any healthcare organisation and was rated as high quality [++]. The authors did not identify any primary studies (specifically, randomised control trials, controlled clinical trials, controlled before and after studies or interrupted time series analyses) addressing strategies or approaches for changing organisational culture to improve healthcare performance for inclusion in their review and therefore no further results are presented in this report.

Four systematic reviews (Hill et al. 2011, Li & Porock 2014, Shier et al. 2014, and Weaver et al. 2013) were rated as low quality [-].

Three systematic reviews examined interventions to improve culture within long-term care settings such as nursing homes and assisted living facilities (Hill et al. 2001, Li & Porock 2014, and Shier et al. 2014). One systematic review looked specifically at strategies for changing ‘safety culture’ as an aspect of wider organisational culture within inpatient healthcare settings (Weaver et al. 2013).

The primary studies ranged from cluster randomised controlled trials to cross-sectional studies. No relevant qualitative studies were identified. Follow-up times for individual primary studies varied and were often not reported within the systematic reviews. Outcome

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measures varied across the reviews from clinical outcomes, such as mortality, to staff outcomes such as absenteeism and turnover. Some systematic reviews provided quantitative results supported by statistical measures but generally, results were reported as narrative statements which were not supplemented by any statistical data.

Overall the available systematic review-level evidence was small and the reporting of quantitative results across all systematic reviews was generally poor. Four out of the 5 included systematic reviews were rated as low quality [-] (Hill et al. 2011, Li & Porock 2014, Shier et al. 2014, and Weaver et al. 2013). Furthermore, 3 of these systematic reviews specifically assessed culture change interventions in long-term care settings such as nursing homes (Hill et al. 2001, Li & Porock 2014, and Shier et al. 2014); while the primary studies assessed organisational-level approaches, the unit of organisation tended to be single nursing homes. It seems unlikely that their findings are generalisable to the much larger and more complex organisations in which most NHS nursing and midwifery care is delivered. Finally, while the systematic review by Weaver et al. (2013) assessed interventions across a more diverse range of healthcare settings, it looked specifically at strategies for changing 'safety culture' as a single element of wider organisational culture; the authors therefore excluded any primary studies which assessed methods for changing overall organisational culture.

Please note an additional 6837 references were identified as part of 'top-up' searches for this review question. The search strategy and review protocol for this 'top- up' search are provided in Appendices A and B. The reference list for these search results is available on request for those wishing to undertake further research on this topic.

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Table 7. Summary of included evidence for review question 4 (n=5 systematic reviews)

Reference [quality]	Objectives and/or review questions	Characteristics of included studies	Management or organisational approach*	Outcomes**	Limitations
Parmelli et al. 2011 [++] **Last search date:** October 2009	To determine the effectiveness of strategies to change organisational culture in order to improve healthcare performance To examine the effectiveness of these strategies according to different patterns of organisational culture	**Number of included primary studies:** 0 **Number of relevant included primary studies:** 0 **Countries:** N/A **Settings:** N/A	The review considered any strategy intended to change organisational culture in order to improve healthcare performance in any healthcare organisation.	**Main outcomes** Objective measures of professional performance e.g. prescription rates, extent to which care is evidence based, quality of care, and efficiency. Objective measures of patient outcome such as mortality, condition-specific measure of outcome, quality of life, functional health status, and patients' satisfaction **Other outcomes** Objective measures of organisational performance such as wait times, inpatient hospital stay times, and staff turnover rates. Measures of organisational culture Economic outcomes such as efficiencies and decrease in costs.	N/A
Weaver et al. 2013 [-] **Last search date:** October 2012	To identify interventions used to promote safety culture in health care, assess the evidence for their effectiveness in improving both safety culture and patient outcomes, and describe the context and	**Number of included primary studies:** 33 studies reported in 35 papers*** **Number of relevant included primary studies:** 8/33 **Countries:**	Thematic analysis identified 3 broad categories of intervention: Team training Executive walk rounds Comprehensive Unit Based Safety Program (CUSP) These approaches are described in detail in table 8.	Safety culture score/safety climate score or scores for individual items/domains within the measurement instruments. Teamwork climate Changes in care processes Patient outcomes (e.g. indices of harm) Clinician outcomes (e.g. turnover, burnout)	Limited inclusion to studies conducted in the USA, UK, Canada or Australia. May therefore have missed relevant literature from other OECD settings Specifically focused on safety culture; studies looking at wider organisational culture were excluded

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Reference [quality]	Objectives and/or review questions	Characteristics of included studies	Management or organisational approach*	Outcomes**	Limitations
	implementation of these interventions.	USA UK Canada Australia (Note: number of studies per country not reported) **Settings:** Inpatient acute care settings including intensive care, perioperative care, labour & delivery, radiology, general medical settings & general surgical settings			Poor reporting: states that 33 studies were included but only 21 studies listed and summarised in appendices Limited statistical data provided to support narrative results statements Described several multicomponent interventions - difficult to determine which elements contributed to changes in outcomes
Hill et al. 2011 [-] **Last search date:** May 2010	To examine the research on resident health outcomes in long-term care facilities when a comprehensive culture change model is implemented.	**Number of included primary studies:** 11 **Number of relevant included primary studies:** 4/11 **Countries:** Not reported **Settings:** Any level of long-term care (LTC) including nursing homes and assisted living	2 culture change models: Eden Alternative (Eden) Wellspring Innovative Solutions for Integrated Health Care (Wellspring) These approaches are described in more detail in table 8.	Psychosocial health outcomes e.g. quality of life, life satisfaction, social environment, care satisfaction, loneliness, boredom, helplessness, depression, emotional well-being, behavioural incidents, restraint use Physical health outcomes e.g. infection rates, medication use, mobility, pressure ulcer rates, mortality.	No statistical data provided to support narrative results statements Culture change models are multicomponent interventions so difficult to determine which aspect is contributing to changes in resident health outcomes Limited generalisability to organisations other than long-term care facilities

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Reference [quality]	Objectives and/or review questions	Characteristics of included studies	Management or organisational approach*	Outcomes**	Limitations
		facilities			
Li & Porock 2014 [-] **Last search date:** April 2013	To synthesise current evidence of the effect of multiple person centred care models on resident outcomes	**Number of included primary studies:** 24 **Number of relevant included primary studies:** 5/24 **Countries:** USA (n=5) **Settings:** Long-term residential care settings	Interventions based on the following programmes: PCC (person centred care) Eden Alternative Wellspring Pioneer Network These approaches are described in more detail in table 8.	Any resident outcome (none pre-specified) Outcomes reported within the relevant included studies: Psychosocial outcomes e.g. loneliness, boredom and helplessness Clinical outcomes e.g. incontinence, falls and physical functioning	No statistical data provided to support narrative results statements Limited generalisability to organisations other than long-term care facilities
Shier et al. 2014 [-] **Last search date:** 2012	What are the scope and nature of nursing home culture interventions that have been studied? How has culture change and the extent of adherence to interventions been measured? How have culture change outcomes been measured? What is the	**Number of included primary studies:** 36 **Number of relevant included primary studies:** 8 studies reported in 9 papers **Countries:** USA (n=3) UK (n=5) **Settings:** Nursing homes	Interventions that aimed to change 1 or more domain of nursing home culture as defined by the authors: Resident direction Home environment Relationships Staff empowerment Collaborative management CQI processes Specific approaches are described in more detail in table 8.	Resident outcomes (e.g. quality of life/wellbeing, mood, satisfaction, cognition, functional status, health status, anxiety/behaviour/agitation, engagement & activities) Quality of care and services (e.g. staff interactions with residents, staff approach to residents, quality of care, verbal support, gentleness, medication use, advance care plans, and number of hospital admissions) Staff outcomes (e.g. attitude, knowledge, satisfaction/wellbeing/burnout, staff perception value, involvement/teamwork, absenteeism, turnover/retention, staff value intervention)	Limited inclusion to studies conducted in the USA, UK or Canada. May therefore have missed relevant literature from other OECD settings.

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Reference [quality]	Objectives and/or review questions	Characteristics of included studies	Management or organisational approach*	Outcomes**	Limitations
	relationship between nursing home culture change interventions and outcomes?				

Abbreviations used: CQI, continuous quality improvement; LTC, long-term care; N/A, not applicable; NR, not reported; OECD, Organisation for Economic Co-operation and Development; PCC person-centred care

* Information about organisational/management approaches is only presented for studies within the systematic review that met the inclusion criteria for the evidence review presented in this report (e.g. studies conducted in OECD countries after 1998). Other organisational/management approaches may have been discussed within the review but only data from extracted primary studies is presented here.

** Outcome data is only presented for primary studies within the systematic review that met the inclusion criteria for the evidence review presented in this report (e.g. studies conducted in OECD countries after 1998). Other outcomes may have been reported within the review but only data from extracted primary studies is presented here.

*** Only 19 primary studies reported in 21 papers are accounted for in the review's appendices; data are therefore unavailable for the other 14 papers. It was difficult to assess whether the 19 primary studies that **are** listed in the appendices met the inclusion criteria for this evidence review - the characteristics of these studies were not well reported.

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The included systematic reviews varied in the number of approaches for assessing or changing organisational culture that they identified. Due to the differences in interventions, outcomes and follow up times reported, pooling of primary studies was not considered appropriate as the full text papers of primary studies were not retrieved and a narrative approach was taken to synthesising results from the included systematic reviews. The results are summarised by study design with table 8 showing the main outcomes for the 20 relevant primary intervention studies reported in 4 systematic reviews (Hill et al. 2011, Li & Porock 2014, Shier et al. 2014, and Weaver et al. 2013) and table 9 showing the main outcomes for the 3 relevant primary observational studies reported in 2 systematic reviews (Hill et al. 2011, Li & Porock 2014).

The systematic review by Weaver et al. (2013) identified a range of interventions to improve safety culture that the authors grouped thematically into 3 categories: team training; executive walk rounds; and the Comprehensive Unit Based Safety Program (CUSP). A detailed description of these categories can be found in the evidence tables in Appendix C. None of the individual studies that assessed the effectiveness of CUSP met the inclusion criteria for this evidence review so no results are presented for this particular approach.

Weaver et al. (2013) reported that they identified 20 primary studies that explicitly examined team training or tools to support team communication as interventions to promote safety culture. However a serious limitation of this review is that only 11 of these 20 primary studies are listed and summarised in the appendices of their systematic review; it is therefore not possible to adequately assess the reliability and validity of the review's findings. Four of the 11 listed studies met the inclusion criteria for the evidence review presented in this report; data from these primary studies were extracted and are presented in table 8. Three out of the 4 primary studies reported statistically significant improvements in staff perceptions of safety culture, 2 primary studies reported improvements in care processes (for example, reductions in care delays) and 1 primary study also reported improvements in a patient safety outcome (reduction in reported errors that resulted in harm). However, the systematic review did not report any information regarding which specific domains of safety culture were improved or any statistical data to indicate the magnitude of effect.

Weaver et al. (2013) also reported that they identified 8 primary studies that evaluated walk rounds (either executive or interdisciplinary) as interventions to promote safety culture. However, as before, the quality of the systematic review is limited by missing data; only 5 of these 8 primary studies are accounted for in the appendices of their systematic review. Four of these 5 studies met the inclusion criteria for the evidence review presented in this report; data from these primary studies were extracted and are presented in table 8. One of these primary studies reports an organisational approach that is a combination of a team training intervention and an executive rounding intervention. All 4 primary studies reported improvement in staff perceptions of safety culture. One primary study, however, showed improvement on only 2 out of 30 items on the safety culture survey completed by staff. Information regarding which specific domains of safety culture were improved is not reported and there were no statistical data to indicate the magnitude of effect. One primary study also reported improvements in a patient safety outcome (reduction in serious safety events). The authors noted the limitations of comparing these types of interventions between studies as 'walk rounds' tend to be operationalised in diverse ways. For example, not all rounding

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interventions used a structured format and the time intervals between rounds varied widely across their included studies.

Three systematic reviews (Hill et al. 2011, Li & Porock 2014, and Shier et al. 2014) identified approaches for changing organisational culture within long-term care (LTC) settings and nursing homes.

The systematic review by Hill et al. (2011) included 2 relevant primary intervention studies assessing the effectiveness of the Eden Alternative programme. The systematic review by Li & Porock (2014) also included 2 relevant primary intervention studies investigating the Eden Alternative but 1 of these primary studies is also included in Hill et al. (2011) so overall there were 3 unique primary studies focusing on this particular approach. A description of the Eden Alternative approach can be found in the evidence tables in Appendix C. One primary before and after study (reported in the 2 systematic reviews) found that residents in the Eden group had significantly lower levels of boredom and helplessness than a comparison group but there was no statistically significant difference in loneliness between the 2 groups. No statistical data were provided in either review to support this finding. Another primary before and after study found that there were no statistically significant differences in outcomes between residents in the Eden group and those in the control group. No statistical data were reported. However a third primary before and after study found that levels of helplessness, loneliness and boredom and depression were significantly lower in the Eden group than the control group. Again, statistical data were not reported.

The systematic review by Li & Porock (2014) included 1 relevant primary intervention study assessing the effectiveness of a culture change model called the Pioneer Network. A description of the Pioneer Network approach can be found in the evidence tables in Appendix C. This primary non-controlled before and after study found that quality of life increased in most domains between baseline and follow-up; there were statistically significant improvements in the domains of dignity, security and individuality but no statistical data were reported to indicate the magnitude of effect.

The systematic review by Shier et al. (2014) included 8 relevant primary intervention studies that evaluated a range of culture change interventions implemented in nursing homes. The systematic review authors assessed how the studied interventions addressed 6 different domains of culture change: resident direction, home environment, relationships, staff empowerment, collaborative management, and continuous quality improvement (CQI) processes. The culture change approaches described in the included primary studies were highly heterogeneous and many were complex interventions comprising a range of diverse elements (such as training programmes, teambuilding activities and involving nursing staff in decision making). The interventions are summarised briefly in table 8 below and described in more detail in the evidence tables in Appendix C. Overall the findings were mixed with some primary studies reporting statistically significant improvements in certain outcomes and other studies reporting negative effects associated with the interventions. It is particularly difficult to make conclusions about the effectiveness of the complex multimodal interventions as there is no way of determining which outcomes were affected by each particular element of the intervention.

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Table 8. Outcomes from primary intervention studies (n=20) reported in included systematic reviews (n=4) for review question 4

Reference of systematic review [quality]; design of primary study/ies; country of primary study	Details of comparison (number of participants)	Description of intervention	Outcome/results
Eden Alternative vs. comparison group			
Hill et al. 2011 [-] and Li & Porock 2014 [-]; 1* controlled before and after study; USA	Eden group (n=80 residents) and comparison (n=80 residents) Length of follow up: 1 year	The Eden Alternative intervention involves empowering residents and caregivers to make care decisions as well as modifying the traditional nursing home environment to include animals, plants, and children.	Significantly lower levels of boredom and helplessness (statistical data not reported by either review)
			No significant difference in loneliness (statistical data not reported by either review)
Hill et al. 2011 [-]; 1 pilot controlled before and after study; USA	3 Eden facilities (n=41 residents) and 2 comparison facilities (n=59 residents) Length of follow up: 2 years	The Eden Alternative intervention involves empowering residents and caregivers to make care decisions as well as modifying the traditional nursing home environment to include animals, plants, and children.	No significant differences in LSI or SCES scores (statistical data not reported)
			NHRQQ results included both positive and negative responses regarding day-to-day life, the nursing home and the Eden Alternative (statistical data not reported)
Li & Porock 2014 [-]; 1 controlled before and after study; USA	Eden group (n=27 residents) Comparison group (n=25 residents) Length of follow up: 9 months	The Eden Alternative intervention involves empowering residents and caregivers to make care decisions as well as modifying the traditional nursing home environment to include animals, plants, and children.	Level of helplessness, loneliness and boredom measured by MDS significantly lower in Eden group than control group (statistical data not reported)
			Level of loneliness and depression measured by UCLA loneliness and geriatric depression scale significantly lower in Eden group than control group (statistical data not reported)
			No significant difference found in dementia quality of life and social network
Pioneer Network (no comparison group)			
Li & Porock 2014 [-]; 1 single group before and after study; USA	Pioneer Network group (n=29 residents) Length of follow up: 3 months	The Pioneer Network is a holistic approach to transformational change towards 'person centred care' (PCC). Certified Nursing Assistants (CNA) received PCC training twice.	QOL was high overall and increased in most domains. Significant improvement in domains of dignity, security and individuality (statistical data not reported).
Enriched Opportunities Programme (no comparison group)			
Shier et al.	3 nursing homes	The Enriched Opportunities	Statistically significant

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Details of comparison (number of participants)	Description of intervention	Outcome/results
2014 [-]; 1 single group before and after study; UK	in intervention group (n=127 residents) Length of follow up: NR	Programme focuses on the role of a "Locksmith" to: • provide individualised assessment and case work • develop activity programmes that are rich, integrated with local community, and flexible. • offered staff training on the programme that emphasised person centred care, teambuilding, and effective communication with residents and other team members. The programme also emphasises staff empowerment as an important component of management and leadership.	improvement in: • resident mood Statistical data not reported Mixed results in: • QOL/wellbeing • engagement & activities • staff approach to residents Statistical data not reported No significant improvement in: • anxiety/behaviour/agitation • cognition • functional status • health status Statistical data not reported
'Transformation of culture change model' vs. comparison group			
Shier et al. 2014 [-]; 1 RCT; UK	4 nursing homes in intervention group (n=32 residents; n=32 staff) 4 nursing homes in control group (n=32 residents; n=22 staff) Length of follow up: NR	• Staff given training to observe and identify signs of awareness in residents with severe dementia. • Staff instructed in the use of the AwareCare observational measure of awareness in severe dementia and given guidance on developing skills in communicating with severely impaired residents • Staff asked to carry out 6 10-minute observations per week in public areas of the home and to participate in group supervision sessions.	Mixed results in: • QOL/wellbeing Statistical data not reported No significant improvement in: • anxiety/behaviour/agitation • cognition • quality of care • staff attitude • satisfaction/wellbeing/burnout Statistical data not reported
Key champions vs. comparison group			
Shier et al. 2014 [-]; 1 before and after study with non-concurrent	Intervention group: 7 nursing homes (n=133 residents) Control group:	• 2 key champions were appointed in each nursing home and were responsible for coordinating and embedding change.	Statistically significant improvement in: • advance care plans Statistical data not reported

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Details of comparison (number of participants)	Description of intervention	Outcome/results
control; UK	number of nursing homes not reported (n=95 residents) Length of follow up: NR	• Key champions attended an initial 4 day training session and then attended 4 workshops over a year. Staff attended separate training. • A facilitator attended each home every 10-14 days to provide ongoing support and meet with management and champions. • Regular case management meetings held. • Champions asked to implement the Gold Standards Framework, a supportive palliative care register that centres around monthly discussion with residents about advance care planning, DNR status, family and resident community, symptoms assessment and control, and an adapted Liverpool Care Pathway for last days of life for care homes.	No significant improvement in: • hospitalisation • staff attitude • staff perception of value Statistical data not reported
Family Involvement in Care (FIC) vs. comparison group			
Shier et al. 2014 [-]; 1 RCT; USA	Intervention group: Special care units in 7 nursing homes (n=93 residents) Control group: Special care units in 7 nursing homes (n=71 residents) Length of follow up: NR	The FIC intervention was a protocol designed to help the family caregivers of NH residents with dementia negotiate and establish a partnership with staff caregivers. 4 key elements: • orientation of a primary family caregiver to the facility, the special care unit and the proposed partnership role • education of the primary family caregiver for involvement in resident care • formation and negotiation of the partnership agreement • follow up with family member and evaluation of staff for the renegotiation of the partnership agreement.	Statistically significant improvement in: • functional status Statistical data not reported Mixed results in: • cognition Statistical data not reported
BE-ACTIVE vs. comparison group			
Shier et al. 2014 [-]; 1 RCT; USA	6 nursing homes Intervention	BE-ACTIVE intervention combines individual sessions conducted by a mental health practitioner, staff	No significant improvement in: • resident mood

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Details of comparison (number of participants)	Description of intervention	Outcome/results
	group: n=13 residents Control group: n=7 residents Length of follow up: NR	training, and collaboration between therapist and staff members. 4 key components: • individual weekly meetings between the depressed resident and MH consultants • involvement of facility staff, particularly activities staff, including a 3 hour training session and ongoing collaboration • systematic assessment and increase in 'pleasant events'[#] • assessment and removal of barriers through behavioural problem solving and weekly communication between MH consultant and activities staff.	• engagement & activities • staff satisfaction/wellbeing/ burnout Statistical data not reported
Multimodal intervention (no specific name) vs. comparison group			
Shier et al. 2014 [-]; 1 RCT; UK	Intervention group: 12 nursing homes (n=118 residents) Control group: 12 nursing homes (n=120 residents) Length of follow up: NR	A research team consisting of a mental health nurse and a clinical psychologist discussed the home environment and procedures. The unmet needs of sampled residents with dementia in both control and experimental groups were summarised in care plans outlining the unmet needs and possible interventions to meet them. A meeting was arranged with the intervention home to provide feedback on the care plans. Intervention group also received weekly 1 hour liaison visit/input.	No significant improvement in: • resident mood • anxiety/behaviour/agitation • resident satisfaction • resident QOL/wellbeing • cognition • functional status Statistical data not reported
Facilitated workshops (no comparison group)			
Shier et al. 2014 [-]; 1 single group before and after study; UK	1 nursing home (n=11 staff) Length of follow up: NR	Staff participated in a series of facilitated workshops based on the Senses Framework. Facilitation used to encourage staff to review their assumptions about the experience of the person living with dementia. Workshops supported staff in adopting a problem-solving approach where they considered how they might enhance the experience of the person with dementia by creating each of the 'senses'. Senses included: sense of continuity, sense of significance, sense of	No significant improvement in: • staff approach to residents • staff attitude • staff wellbeing • staff involvement/teamwork Statistical data not reported

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Details of comparison (number of participants)	Description of intervention	Outcome/results
		belonging, sense of purpose, sense of achievement, sense of security.	
Multimodal intervention (no specific name) vs. comparison group			
Shier et al. 2014 [-]; 1 controlled before and after study (reported in 2 papers); USA	Intervention group: 5 nursing homes Control group: 5 nursing homes In total: n=314 CNAs; n=149 licensed nurses; n=530 residents Length of follow up: NR	CNA teams were organised by shifts and service areas. Implementation included orienting and training CNAs, nurses, and nurse management. CNAs became engaged in various decisions. The activities of CNAs in empowered work teams included: • being involved in nurse management decisions related to CNA work • reviewing resident health conditions and making recommendations, addressing issues and dealing with any other issues of CNA concern. • holding weekly meetings to address various issues related to CNAs' new role. Minutes from weekly meetings and any recommendations were forwarded to nurse management who provided their written feedback. Once there was agreement between the 2 parties, a proposed change was implemented.	Statistically significant improvement in: • staff turnover/retention Statistical data not reported Mixed results in: • family satisfaction • staff satisfaction/wellbeing/ burnout • staff value intervention Statistical data not reported No significant improvement in: • staff absenteeism Statistical data not reported
Team training/team communication interventions (no comparison group)			
Weaver et al. 2013 [-];1 single group before and after study; NR	Intervention group: n=85 staff No comparison group Length of follow up: NR	Multicomponent intervention comprising: feedback, QI education, CPOE, medication management, report form	Statistically significant improvement ($p<0.05$) in: • teamwork climate • reported errors resulting in harm Statistical data not reported Non-significant improvement ($p>0.05$) in: • safety climate Statistical data not reported

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Details of comparison (number of participants)	Description of intervention	Outcome/results
Weaver et al. 2013 [-]; 1 single group study, study design not clear** ; NR	Intervention group: 7 international sites, n=257 staff No comparison group Length of follow up: NR	Multicomponent intervention comprising: 15 prevention practices, 9 detection practices, 5 corrective practices (no further detail provided about these various practices)	Statistically significant (p<0.05): • Improvement in non-punitive responses to error (1 of 3 targeted safety culture dimensions) • 24% reduction in 'code rates'[#] for 12 hospitals
Weaver et al. 2013 [-];1 single group before and after study; UK	Intervention group: 1 teaching hospital, number of staff in sample NR No comparison group Length of follow up: NR	Crew Resource Management course followed by 3 months of coaching 2 times per week	Statistically significant improvement (p<0.05) in: • safety climate • quality of observed teamwork behaviours (pre-test:37; post-test: 38.7)
Weaver et al. 2013 [-]; 1 single group before and after study ; NR	Intervention group: 1 academic Veterans' Affairs hospital, n=44 staff No comparison group Length of follow up: NR	Team training, debriefing/checklists, long-term monitoring	Statistically significant improvement (p<0.05) in: • 2 out of 6 domains on safety culture survey • hand-off issues • care delays Statistical data not reported; no information given re: which dimensions of safety culture were improved
Executive walk rounds or interdisciplinary rounding interventions (no comparison group)			
Weaver et al. 2013 [-]; 1 single group before and after study; NR	Intervention group: 2 hospitals, n=1256 staff No comparison group Length of follow up: NR	Executive walk rounds	Statistically significant improvement (p<0.05) in: • safety climate in 1 hospital (pre-test:65%; post-test: 77%) Non-significant improvement (p>0.05) in: • safety climate in 1 hospital (pre-test:46%; post-test: 56%)
Weaver et al. 2013 [-]; 1 cluster RCT; NR	Intervention group: 23 units across 1 teaching hospital, n=1000	Executive walk rounds	Statistically significant improvement (p<0.05) in: • safety climate (pre-test:52.5%; post-test: 72.9%)

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Details of comparison (number of participants)	Description of intervention	Outcome/results
	staff (n=598 nurses) Comparison group unclear, n=NR Length of follow up: NR		
Weaver et al. 2013 [-]; 1 single group before and after study; NR	Intervention group: 1 community hospital, n=112 staff No comparison group Length of follow up: NR	Multicomponent rounding intervention comprising: measure culture, patient safety education, share stories, weekly executive walk rounds, prioritise improvement efforts, identify staff safety concerns, implement improvements	Statistically significant improvement (p<0.05) in: • 2 out of 30 items on safety culture survey Statistical data not reported; no information given regarding which dimensions of safety culture were improved
			Statistically significant decrease (p<0.05) in: • 1 out of 30 items on safety culture survey Statistical data not reported; no information given regarding the dimension of safety culture that worsened
Combination intervention (team training + executive walk rounds) (no comparison group)			
Weaver et al. 2013 [-]; 1 time series study; NR	Intervention group: 1 paediatric teaching hospital, n=3752 staff Length of follow up: NR	Multicomponent intervention comprising: error prevention training, coaching, family engagement, restructured patient safety governance, lessons learned programme, cause analysis programme, executive rounds	Statistically significant improvement (p<0.05) in: • 10 of 14 dimensions of safety culture (statistical data not reported; no information given regarding which dimensions of safety culture were improved) • days between serious safety events (pre-test:19.4; post-test: 55.2)
			Statistically significant reduction (p<0.05) in: • serious safety events (pre-test:0.9; post-test: 0.3)

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Details of comparison (number of participants)	Description of intervention	Outcome/results

Abbreviations: CNA certified nursing assistant; CPOE computerised physician order entry; DNR do not resuscitate; FIC, family involvement in care; LSI Life Satisfaction Index; MDS minimum data set; MH mental health; NHRQQ Nursing Home Resident Qualitative Questionnaire (NHRQQ); NH nursing home; NR not reported; PCC person-centred care; QI quality improvement; QOL quality of life; RCT randomised control trial; SCES Sheltered Care Environment Scale; UCLA University of California – Los Angeles.

NB: the outcome/results data extracted for all included systematic reviews relate to results from individual studies that met the inclusion criteria for the evidence review presented in this report (e.g. primary studies conducted in OECD countries after 1998)

* This single study is reported in 2 of the included systematic reviews. The data are only presented once to prevent 'double counting' of this primary study's findings.

** This primary study is reported inconsistently throughout the review; in 1 table it is labelled as a pretest-posttest study and in 2 other tables it is reported as a time series study

Term not defined or described in any further detail

Table 9 shows the various outcomes reported across the 3 relevant primary observational studies which were included in 2 systematic reviews (Hill et al. 2011, Li & Porock 2014). Overall, there are mixed findings for the association between culture change interventions and various clinical outcomes.

The systematic review by Hill et al. (2011) included 1 relevant primary observational study assessing the impact of the Eden Alternative programme. This longitudinal study had mixed findings: statistically significant improvements were observed for some outcomes (for example, reductions in behavioural incidents and the occurrence of Stage I and II pressure ulcers) but there were also some statistically significant adverse outcomes (for example, increases in urinary tract infections). No statistically significant change in mortality rates was observed. No statistical data were provided to support the narrative results statements from this study; it is not clear whether this is because no data were reported by the authors of the original study or if they were just omitted from the systematic review.

The systematic review by Hill et al. (2011) included 1 relevant primary observational study assessing the impact of a culture change model called Wellspring Innovative Solutions for Integrated Health Care (Wellspring); this primary study was also included in Li & Porock (2014). This approach is described in more detail in the evidence tables in Appendix C. The findings from this study were reported slightly differently in the 2 systematic reviews; Hill et al. reported that there were significantly fewer 'deficiencies' (this term was not defined) in residents who had been exposed to Wellspring but stated that this primary study found no differences in either behavioural incidents or the use of restraints between the intervention and control groups. Li & Porock (2014) simply stated that there were no significant differences in resident outcomes (incontinence, falls, behaviour, physical functioning, nutritional status, restraints, and skin care) between the intervention and control groups. No statistical data were provided to support the narrative findings reported in either systematic review.

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The systematic review by Li & Porock (2014) included 1 relevant primary observational study assessing a 'person centred care' (PCC) intervention. This cross-sectional study reported a number of statistically significant findings including a positive association between staff members' attitudes towards PCC and resident-reported quality of life. No statistical data are provided to support the narrative findings reported in the systematic review.

Table 9. Outcomes from primary observational studies (n=3) reported in included systematic reviews (n=2) for review question 4

Reference of systematic review [quality]; design of primary study/ies; country of primary study	Organisational details	Exposure of interest	Outcomes/results
Hill et al. 2011 [-]; 1 longitudinal study; NR	6 facilities (n=734), multiple measures taken over two year study period	The Eden Alternative intervention involves empowering residents and caregivers to make care decisions as well as modifying the traditional nursing home environment to include animals, plants, and children.	Significant decreases in: • behavioural incidents • Stage I and Stage II pressure ulcers • restraints • bedfast[#] residents Statistical data not reported
			Significant increases in: • urinary tract infections • chair-bound residents Statistical data not reported
			No significant difference in: • Stage III and IV pressure ulcers • polypharmacy • mortality Statistical data not reported
Hill et al. 2011 [-] and Li & Porock 2014 [-]; 1* secondary data analysis study; USA	11 facilities, data analysis undertaken over varying implementation periods of up to 6 years	The Wellspring model is designed to improve clinical care through the provision of an ongoing series of training modules and the systematic transfer of this knowledge to each facility and unit within the nursing home.	Reported in Hill et al.
			Significantly fewer deficiencies in the Wellspring group Statistical data not reported
			No severe deficiencies in the Wellspring group Statistical data not reported
			Limited data provided on MDS indicators

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Organisational details	Exposure of interest	Outcomes/results
			Statistical data not reported
			Reported in Li et al.
			No significant difference in resident outcomes (incontinence, falls, behaviour, physical functioning, nutritional status, restraints, and skin care) between groups Statistical data not reported
Li & Porock 2014 [-]; correlational cross-sectional study; USA	421 residents with dementia within 44 long-term care facilities	Person-Centred Care (PCC) intervention (not defined in any further detail)	Staff's PCC attitude positively related to: • resident-reported dementia QOL • activity in QOL-AD • staff-reported residents' positive affect in QOL-AD Statistical data not reported
			Resident-perceived better care was related to? resident-perceived better QOL Statistical data not reported
			Observed positive person work was positively correlated with observed QOL from DCM Statistical data not reported

Abbreviations: DCM, dementia care mapping; MDS, minimum data set; NR, not reported; PCC, Person-Centred Care; QOL, quality of life; QOL-AD, quality of life in Alzheimer's disease

***** This single primary study is reported in 2 of the included systematic reviews. The data are only presented once to prevent 'double counting' of this study's findings.

[#] Term not defined or described in any further detail

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Parmelli et al (2011) recommended that healthcare organisations considering implementing interventions aimed at changing culture should seriously consider conducting an evaluation (using a robust study design) to strengthen the evidence about this topic.

Weaver et al. (2011) concluded that their results supported the effectiveness of certain interventions in improving staff perceptions of safety culture but there was less evidence of an effect on clinical care processes and outcomes related to patient harm. They conceded that overall, their conclusions were tempered by the limitations of the included evidence, for example non-controlled study designs and small sample sizes.

All 3 systematic reviews assessing culture change interventions in long-term care settings (Hill et al. 2011, Li & Porock 2014, and Shier et al. 2014) reported that their overall findings were largely inconclusive. Shier et al. (2014) concluded that their systematic review had not found sufficient evidence to enable the provision of specific guidance for nursing homes interested in implementing culture change. The systematic reviews by Hill et al. (2011) and Li & Porock (2014) concluded that the available scientific evidence did not show strong associations between comprehensive culture change models and physical health benefits to residents in long-term care settings. However, they perceived that the findings regarding psychosocial benefits were more persuasive.

Overall, there were mixed findings for organisational approaches to assess and change organisational culture. There was some low quality evidence from primary intervention studies that suggests that culture change interventions may be effective in improving certain service user and staff outcomes. There were mixed findings for the association between culture change interventions and outcomes reported in observational studies. It is acknowledged that the identified evidence may have limited applicability to UK settings as some systematic reviews examined specific health and service user outcomes which may not be relevant to all organisations in which NHS care is delivered.

4.4.3 Evidence Statements

Evidence from 20 primary intervention studies reported in 4 systematic reviews (Hill et al. 2011 [-], Li and Porock 2014 [-], Shier et al. 2014 [-], Weaver et al. 2013 [-]) showed mixed findings for the different interventions for changing organisational culture and outcomes reported. In general, reporting of outcomes was often poor and study designs varied from cluster RCTs to uncontrolled before and after studies. There is some evidence from:

- Randomised primary studies which suggest that the use of a transformation of culture change model, BE-ACTIVE intervention and a multimodal intervention did not impact on various outcomes (such as quality of care, staff attitude and satisfaction/wellbeing/burnout, resident mood).

- The use of a family involvement in care (FIC) intervention (which aimed to allow family caregivers of people with dementia to establish relationships with staff) improved functional status (no statistical data reported) and executive walk rounds led to improvements in safety climate ($p<0.05$). However, it is noted that the latter finding was not consistently supported by findings from 2 primary before and after studies.

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Overall, the evidence may not be applicable as most primary studies were conducted in long-term residential care facilities which may not be relevant to all organisations in which NHS nursing or midwifery care is delivered.

Evidence from 3 primary observational studies reported in 2 systematic reviews (Hill et al. 2011 [-], Li and Porock 2014 [-]) showed mixed findings for the association between organisational exposures (The Eden Alternative, The Wellspring model and person centred care) and several outcomes (such as pressure ulcers, behavioural incidents, urinary tract infections, mortality and quality of life). In general, reporting of outcomes and study design was often poor and conclusions around effectiveness are not possible.

- There is evidence from 1 primary longitudinal study to suggest that use of The Eden Alternative may be associated with improvements in behavioural incidents, early stage pressure ulcers, restraints and bedfast residents (no statistical data reported), increases in urinary tract infections and chair bound residents (no statistical data reported) and no impact on later stage pressure ulcers, polypharmacy and mortality.

- These findings are supplemented by evidence from 3 primary before and after studies which suggest that The Eden Alternative may be associated with lower levels of boredom and helplessness (statistical data not reported). Overall, the evidence may not be applicable as some studies were conducted in nursing care homes which may not be relevant to all organisations in which NHS nursing or midwifery care is delivered.

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3.5 Review Question 5

This section of the report presents the findings related to review question 5. Details of the included systematic reviews are reported in the evidence tables in Appendix C. A summary of the included systematic reviews is provided in table 10. Results are reported in tables 11, 12, 13 and 14 accompanying each section.

3.5.1 Review Question

What organisational approaches are effective for assessing and changing organisational leadership and support safe staffing for nursing and midwifery across an organisation? How should these approaches be implemented? For example:

- What methods for assessing or changing organisational leadership are effective and how reliable and valid are they?
- How often should the approaches be used?
- How do these approaches influence the delivery of safe nursing and midwifery care?

Examples of organisational approaches include:

- leadership development and improvement programmes.

3.5.2 Evidence

Overall, 2 systematic reviews (Titzer et al. 2013, Pearson et al. 2007) were identified for this review question. Table 10 provides a summary of the included evidence for this review question.

One systematic review was rated as moderate (Pearson et al. 2007 [+]) while the other was rated as low quality (Titzer et al. 2013 [-]). Titzer et al. (2013) aimed to review the literature supporting nurse manager succession planning to develop best practice for identifying and developing future nurse managers. Pearson et al. (2007) aimed to review the feasibility, meaningfulness and effectiveness of nursing leadership attributes that contribute to the development and sustainability of nursing leadership to foster a healthy work environment.

Titzer et al. (2013) reports only qualitative outcomes for nurse manager succession planning and does not examine the effectiveness of planning on outcomes. Pearson et al. (2007) reports both quantitative and qualitative outcomes for the association between leadership attributes and outcomes. However, quantitative findings did not appear to be supported by any statistical measures. Furthermore, all relevant included studies supporting quantitative findings were correlational, therefore cannot be used to support causal relationships between leadership and outcomes.

Overall, the following organisational approaches for assessing and changing organisational leadership across the 2 included systematic reviews covered:

- nurse manager succession planning
- empowerment
- leadership styles

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- transformational leadership
- transactional leadership
- leadership behaviours and characteristics
- quality mindedness, managerial leadership and constructive culture
- challenging the process, inspiring shared vision, enabling others to act
- coordination and provision of opportunity
- effective communication skills.

The quantitative outcomes reported across the 16 primary correlational studies included in Pearson et al. (2007) were categorised as:

- staff related outcomes (for example staff job satisfaction)
- organisational related outcomes (for example organisational culture)
- patient related outcomes (for example patient quality of life).

Pooling of primary studies included within this review was not possible as the full text papers of primary studies were not retrieved and due to the differences in study design and the method of outcome reporting; therefore a narrative approach was taken. The results are summarised by type of outcome or study design with table 11 showing qualitative outcomes for the 13 primary studies reported on nurse manager succession planning, while tables 12, 13 and 14 show outcomes associated with nursing leadership reported in 1 systematic review, 16 primary correlational studies and 1 primary qualitative study respectively.

Overall, there was no evidence relating to the effectiveness of nurse manager succession planning; although 1 systematic review developed a dynamic model for succession planning which includes: strategic planning, resource allocation, key positions and competency identification, high potential leader selection, leadership development process, mentoring/coaching and programme and candidate evaluation. There was some correlational evidence from 16 primary studies to suggest that several leadership approaches were associated with beneficial outcomes (staff, organisational and patient). However, it is acknowledged that this evidence does not support a causal relationship and it was unclear whether findings were supported by statistical measures. The applicability of the evidence was often difficult to assess due to limited descriptions of primary study characteristics.

Please note an additional 10,865 references were identified as part of ‘top-up’ searches for this review question. The search strategy and review protocol for this ‘top- up’ search are provided in Appendices A and B. The reference list for these search results is available on request for those wishing to undertake further research on this topic.

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Table 10. Summary of included evidence for review question 5 (n=2 systematic reviews)

Reference [quality]	Objectives and/or review questions	Characteristics of included studies	Management or organisational approach*	Outcomes*	Limitations
Titzer et al. 2013 [-] **Last search date:** Search parameters reported as 2007-2012	To review and examine the literature supporting nurse manager succession planning	**Number of included primary studies:** 13 **Number of relevant primary included studies:** 13/13 **Countries:** USA (n=11), international (n=2) **Settings:** NR	Succession planning defined as '…a strategic process involving identification, development and evaluation of intellectual capital, ensuring leadership continuity within an organisation.'	Common themes identified current nurse manager succession planning common succession planning elements outcomes and evaluation methods barriers to succession planning implementation	No randomised evidence included Poor reporting of methods and characteristics of included primary studies
Pearson et al. 2007 [+] **Last search date:** December 2004	To examine the feasibility, meaningfulness and effectiveness of nursing leadership attributes as well as system policy constructs that impact on the development and sustainability of nursing leadership to foster as healthy work environment	**Number of included primary studies:** 44 **Number of relevant included primary studies:** 19/44 **Countries:** USA (n=19) **Settings:** Various healthcare environments	Leadership attributes that foster a health work environment, as well as system and policy constructs: Empowerment Leadership styles Leadership behaviours and characteristics	Nursing staff outcomes (including the promotion of physical and mental health evidenced by observable positive health and well-being, job and role satisfaction, retention rates, turnover) Patient outcomes (including functional status, therapeutic self-care, symptom management of pain, fatigue) System outcomes (including length of stay, cost per case and delivery of observable high quality patient care)	Many findings based on single studies No randomised evidence included Poor reporting of methods and characteristics of included primary studies (including unclear and often inconsistent reference numbers)

Abbreviations: NR, not reported
*Management/organisational approach and outcomes are those extracted from the relevant included primary studies within the reported systematic review

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Table 11 shows the 4 common themes which were synthesised in Titzer et al. (2013). This systematic review aimed to identify literature supporting nurse manager succession planning. The common themes identified were; current use of nurse manager succession planning practice, common succession planning elements, outcomes and evaluation methods and barriers to succession planning implementation. Based on the literature and current practice, Titzer et al. (2013) recommend a dynamic model for succession planning (see table 10). However, the effectiveness of succession planning is not discussed and there is limited information relating to study characteristics of primary studies. In addition, the systematic review authors acknowledge that a detailed evaluation method demonstrating a positive return on investment is needed, which utilises a cost-benefit analysis and empirical outcomes.

Table 11. Qualitative outcomes from primary studies (n=13) reported in a systematic review (n=1) on nurse manager succession planning

Reference of systematic review [quality]; design of primary study/ies; country of primary study	Sample details	Summary of main findings from individual studies*	Common theme identified by systematic review	Recommendations of systematic review
Titzer et al. 2013 [-]; 6 studies; USA	NR	Nurse managers are historically selected based on clinical performance and/or seniority. Those commonly selected for the position lack adequate preparation and leadership skills to do the job effectively. As a result nurse managers often take months to achieve competency and during their role transition, productivity, nurse satisfaction and patient outcomes are adversely affected.	Current use of nurse manager succession planning practices	A dynamic model for succession planning is recommended which includes the following elements: Strategic planning Resource allocation Key positions and competency identification High potential leader selection Leadership development process Mentoring/coaching Programme and candidate evaluation
Titzer et al. 2013 [-]; 12 studies; USA	NR	Eight comment elements within healthcare succession planning models have been identified: strategic planning, competency, key position identification, candidate selection, mentoring and coaching, developmental processes, resource allocation and evaluation. Determining short and long-term succession planning goals is essential. Identifying internal high potential intellectual capital is a key succession planning antecedent. Mentoring and coaching future leaders is a critical succession planning element and must be a deliberate and strategic action. Succession planning necessitates formal leadership development education.	Common succession planning elements	

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Sample details	Summary of main findings from individual studies*	Common theme identified by systematic review	Recommendations of systematic review
Titzer et al. 2013 [-]; 10 studies; USA	NR	Strategic succession planning requires formal programme and outcome evaluation. The literature reports that strategic and deliberate succession planning increases leadership competency. Qualitative evaluations indicate that succession planning supports a nurturing environment and increases nurses' appreciation of leadership positions. Other anticipated outcomes of succession planning are improved work environments and increased patient and nurse satisfaction.	Outcomes and evaluation methods	
Titzer et al. 2013 [-]; 6 studies; USA	NR	Current leaders may simply assume, often incorrectly, that someone will be prepared and willing to take vacant nurse management positions. Another barrier to succession planning implementation is that replacement of nurse managers is viewed as a secretive process managed by a few executives. Resistance from current nursing leaders to share their knowledge and experiences with potential successors is a major succession planning constraint. Proactively identifying leadership gaps and developing leaders through strategic knowledge transfer is a crucial succession planning effort.	Barriers to succession planning	

Abbreviations: NR, not reported
*Please note only a summary of the narrative synthesis is presented here (see evidence table for full details)

Tables 12 and 13 show the outcomes associated with nursing leadership reported in Pearson et al. (2007). Evidence from 1 systematic review and 19 relevant primary observational studies included within Pearson et al. (2007) are reported in these tables. This systematic review aimed to examine the nursing leadership attributes that contribute to the development and sustainability of nursing leadership to foster a healthy work environment. Overall, several leadership approaches (empowerment, transformational or transactional) and leadership characteristics (such as managerial leadership, constructive culture, shared vision, challenging processes, coordination and effective communication) were positively correlated with beneficial outcomes (such as job satisfaction, organisational commitment,

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patient satisfaction, patient quality of life and productivity). However, the included primary studies were correlational and do not provide evidence to support causal associations between leadership and improved outcomes. In addition, the results were reported as narrative statements and it is unclear if they are supported by statistical measures.

Table 12. Quantitative outcomes from a systematic review (n=1) reported in a systematic review* (n=1) on developing and sustaining nursing leadership

Reference of systematic review [quality]; design of primary study/ies; country of primary study	Comparison	Follow up [N]	Outcomes/results
Pearson et al. 2007 [-]; 1 systematic review with 8 RCTs included; NR	Local opinion leader vs. no intervention or other intervention	NR [296 health professionals]	Professional practice: some improvement in 6/7 studies (no further data reported)
			Patient outcomes: improvement in1/3 studies (no further data reported)
Abbreviations: NR, not reported * Please note that the references numbers reported in Pearson et al (2007) were unclear and often did not match the paper of interest			

Table 13. Outcomes from primary observational studies (n=16) reported in a systematic review* (n=1) on developing and sustaining nursing leadership

Reference of systematic review [quality]; design of primary study/ies; country of primary study	Leadership variable of interest	Follow up [N]	Outcomes/results
Pearson et al. 2007 [-]; 6 correlational studies; NR	Empowerment	NR [unclear]	Job satisfaction: staff who were empowered were more satisfied with their job (positive relationship reported, no further data reported)
Pearson et al. 2007 [-]; 1 correlational study; NR		NR [672 RNs]	Employee accountability: positive relationship (no further data reported)
Pearson et al. 2007 [-]; 2 correlational studies; NR		NR [1209 RNs]	Work effectiveness: positive relationship (no further data reported)
Pearson et al. 2007 [-]; 2 correlational studies; NR		NR [824 RNs]	Organisational commitment: positive relationship (no further data reported)
Pearson et al. 2007 [-]; 2 correlational studies; NR		NR [824 RNs]	Organisational Trust: positive relationship (no further data reported)
Pearson et al. 2007 [-]; 1 correlational study; Canada		NR [537 RNs]	Job tension: access to empowerment associated with lower levels of job tension (no further data reported)
Pearson et al. 2007 [-]; 1 correlational study; NR	Leadership styles (transformational leadership)	NR [NR]	Staff job satisfaction[1]: positive relationship (no further data reported) Unit effectiveness[1]: positive relationship (no further data

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Leadership variable of interest	Follow up [N]	Outcomes/results
			reported)
Pearson et al. 2007 [-]; 1 correlational study; NR		NR [143 leaders, 473 staff from 31 clinical teams, 184 patients]	Patient satisfaction: positive relationship (no further data reported) Patient quality of life: positive relationship (no further data reported)
Pearson et al. 2007 [-]; 2 correlational studies; NR		NR [NR]	Extra effort[1]: positive relationship (no further data reported)
Pearson et al. 2007 [-]; 1 correlational study; NR		NR [236 team leaders, 620 staff from hospital and community mental health programs]	Organisational culture: positive relationship (no further data reported)
Pearson et al. 2007 [-]; 1 correlational study; NR	Leadership styles (transactional leadership)	NR [143 leaders, 473 staff from 31 clinical teams, 184 patients]	Patient satisfaction: positive relationship (no further data reported) Patient quality of life: positive relationship (no further data reported)
Pearson et al. 2007 [-]; 1 correlational study; NR	Leadership behaviours and characteristics (Quality mindedness, managerial leadership & constructive culture)	NR [convenience sample]	Staff job satisfaction: positive relationship (no further data reported)
Pearson et al. 2007 [-]; 1 correlational study; NR	Leadership behaviours and characteristics (Challenging the process, inspiring a shared vision, enabling others to act)	NR [convenience sample of 20 managers]	Staff job satisfaction[1]: positive relationship (no further data reported)
			Productivity[1]: positive relationship (no further data reported)
			Organisational commitment[1]: positive relationship (no further data reported)
Pearson et al. 2007 [-]; 1 correlational study; NR	Leadership behaviours and characteristics (Coordination and provision of opportunity)	NR [255 RNs]	Staff job satisfaction: positive relationship (no further data reported)
			Nurses' intent to stay in an organisation: positive relationship (no further data reported)
Pearson et al. 2007 [-]; 1 correlational study; NR	Leadership behaviours and characteristics (effective communication skills)	NR [convenience sample]	Effectiveness of the unit: positive relationship (no further data reported)

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Leadership variable of interest	Follow up [N]	Outcomes/results

Abbreviations: NR, not reported; RN, registered nurse
* Please note that the references numbers reported in Pearson et al (2007) were unclear and often did not match the paper of interest
[1]The results are supported by other primary studies which have not been extracted into this results table as these studies do not meet the inclusion criteria of the current report (for example were conducted before 1998)

Table 14 shows the various meta-synthesised themes reported in Pearson et al. (2007) which are supported by findings from 1 relevant qualitative primary study. Overall, the findings suggest that the following key themes may be important in nursing leadership: collaboration, positive behaviours and qualities, professional development and the need for a supportive environment.

Table 14. Qualitative outcomes from a primary study (n=1) reported in a systematic review (n=1) on developing and sustaining nursing leadership

Reference of systematic review [quality]; design of primary study/ies; country of primary study	Aim of study	Summary of main findings from individual studies	Meta-synthesis reported in systematic review*
Pearson et al. 2007 [-]; 1 interview study; NR	To gain an understanding of nurse leaders' perception of how they value their role and their beliefs about power and gender interface with role worth	Collaboration among healthcare professionals can result in improved outcomes	**Collaboration**[1] Healthcare teams that collaborate can improve outcomes for staff and patients resulting in a healthier work environment
		Providing mentorship to staff can lead to professional growth	**Leaders promoting professional growth for staff**[1] An element of the leadership role is to encourage staff to undertake professional development activities
		Providing staff with appropriate access to resources enables them to more effectively perform their work	**Positive leadership attributes**[1] Leaders who exhibit certain qualities and behaviours are likely to yield positive outcomes for staff and patients
		Nurses are more likely to support decisions when they have been provided with sufficient information	
		Organisations that provide a supportive environment will assist in improving patient outcomes	**Provide a supportive environment**[1] A supportive structure within an organisation can benefit

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Reference of systematic review [quality]; design of primary study/ies; country of primary study	Aim of study	Summary of main findings from individual studies	Meta-synthesis reported in systematic review*
		Those in leadership positions recognise the importance of providing a supportive environment for professional advancement for their staff	people in leadership roles and assist those in leadership roles to provide support to their staff

Abbreviations: NR, not reported
*Synthesised statements reported in Pearson et al. (2007) may have been supported by primary studies that did not meet the inclusion criteria for the current evidence report
[1]The synthesised statement is supported by other primary studies or discursive evidence which have not been extracted into this results table as these studies do not meet the inclusion criteria of the evidence review presented in this report (for example if they were conducted before 1998)

3.5.3 Evidence Statements

Evidence from 13 studies reported in 1 systematic review (Titzer et al. 2013 [-]), were synthesised to identify 4 common themes for nurse manager succession planning (current use of planning practices, common planning elements, outcomes and evaluation methods and barriers.) The results of the systematic review were used to develop a dynamic model for succession planning which includes: strategic planning, resource allocation, key positions and competency identification, high potential leader selection, leadership development process, mentoring/coaching and programme and candidate evaluation. However, there were limited descriptions of the primary studies included in the review (for example study characteristics). In addition, no conclusions can be made on the effectiveness of nurse manager succession planning on outcomes. Overall, the evidence included may be partially applicable as the effectiveness of succession planning is not examined and included primary studies were conducted in the USA, where employment terms and conditions may differ to organisations in the UK where NHS nursing or midwifery care is delivered.

Evidence from 16 primary correlational studies reported in 1 systematic review (Pearson et al. 2007 [-]) found that several leadership approaches (empowerment, transformational or transactional) and characteristics (such as managerial role, constructive culture, shared vision, challenging processes, coordination and effective communication) were positively correlated with beneficial outcomes (such as job satisfaction, organisational commitment, patient satisfaction, patient quality of life and productivity). However, the evidence cannot be used to support causal associations between leadership and improved outcomes and it is unclear if results were supported by statistical measures. Overall, it is difficult to assess the applicability of the findings as descriptions of study characteristics (such as the organisation studies were conducted in) were limited.

Evidence from 1 qualitative primary study reported in 1 systematic review (Pearson et al 2007 [-]) used meta-synthesis to identify key themes (collaboration, positive behaviours and qualities, professional development and the need for a supportive environment) that may be important in nursing leadership. Overall, it is difficult to assess the applicability of the findings

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as descriptions of study characteristics (such as the organisation studies were conducted in) were limited

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4 Conclusions

4.1. Summary of the evidence

The evidence review presented in this report identified 15 systematic reviews that looked at management and organisational approaches to safe nursing and midwifery staffing. Of the 15 systematic reviews:

- Five of the systematic reviews addressed staff and team management approaches to safe staffing.
- Five systematic reviews addressed approaches for assessing and changing organisational culture.
- Three systematic reviews focused on approaches to addressing deficits in nursing and midwifery staff levels.
- Two systematic reviews investigated approaches to changing organisational leadership.

No systematic reviews were identified to assess the effectiveness of management systems to support safe staffing.

No systematic reviews of relevant economic evaluations or analyses were identified to address any of the review questions.

The interventions identified within the included systematic reviews were highly heterogeneous and many were complex interventions comprising numerous diverse elements. Findings were generally mixed. Overall there was a lack of high quality systematic review-level evidence to support robust conclusions about the effectiveness of management and organisational approaches to support safe staffing for nurses and midwives.

Searches were performed to identify relevant primary studies of management and organisational approaches to safe nursing and midwifery staffing ('gap' search and 'top up' searches).

A reference list of 313 provisionally identified papers from the 'gap' search for the effectiveness of management systems is provided in the appendices of this report.

The 'top-up' searches for the remaining four review questions (primary studies of staff and team management approaches to safe staffing, approaches for assessing and changing organisational culture, approaches to addressing deficits in nursing and midwifery staff levels, and approaches to changing organisational leadership) identified 33,243 references for screening. The results of these searches are available on request to anyone who may be undertaking research on this topic in the future.

4.2. Gaps in the evidence

Many of the references identified in the literature searches failed to meet the threshold for classification as a systematic review. While many references were labelled as systematic reviews, a substantial proportion of these failed to adequately report a search strategy,

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screening criteria or a process for appraising the quality of included studies. Where these systematic review methods were not demonstrated, references had to be excluded.

A large number of systematic reviews identified in the literature searches did not include a high enough proportion of relevant evidence; that is, they failed to reach the 80% threshold for primary studies conducted in OECD countries since 1998 that is recommended in Methods for the development of NICE public health guidance (third edition) (NICE 2012).

Some of the systematic reviews included primary studies that assessed approaches in nursing homes. It seems unlikely that these findings are generalizable to the much larger and more complex organisations in which most NHS nursing and midwifery care is delivered.

Overall there was a lack of high quality systematic review-level evidence to address the review questions. Specifically:

- There was a lack of high quality systematic review-level evidence to support the effectiveness of staff and team management approaches to safe staffing for nurses and midwives.
- No systematic review-level evidence that specifically describes how management systems may support safe staffing for nurses and midwives was found.
- There was a lack of high quality systematic review level evidence describing approaches for addressing risk to patient care posed by variation in demand for services, variation in patient or service user needs, or deficits in nursing and midwifery staff levels and skill mix across an organisation.
- No robust systematic review level evidence to support the use of specific approaches to change organisational culture across all settings in which NHS nursing and midwifery care is delivered was found.
- There was a lack of high quality systematic review-level evidence describing approaches for assessing and changing organisational leadership to support safe staffing for nurses and midwives.

In addition, no systematic review-level evidence from economic evaluations regarding the cost effectiveness of different management and organisational approaches to support safe staffing was found.

4.3. Suggested research areas

Looking at primary studies may provide more insight into the effectiveness of specific organisational and management approaches to support safe staffing. The preliminary search results for relevant primary studies are provided in the appendices to this report. This information has been supplied to support any future research in this area.

The gaps in the evidence for this review present several potential areas for research, including high quality studies of the following:

- Effectiveness of staff and team management approaches to safe staffing for nurses and midwives.

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- How management systems may support safe staffing for nurses and midwives.
- Approaches for addressing risk to patient care posed by variation in demand for services, variation in patient or service user needs, or deficits in nursing and midwifery staff levels and skill mix across an organisation.
- Approaches to change organisational culture across settings in which NHS nursing and midwifery care is delivered.
- Approaches for assessing and changing organisational leadership to support safe staffing for nurses and midwives.
- Cost effectiveness of different management and organisational approaches to support safe staffing.

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