

Master of Clinical Science

The effectiveness of a team nursing model compared with a total patient care model on staff wellbeing when organizing nursing work in acute care wards

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Date: July 2016



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Declaration

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Background

The organization of the work of nurses, according to recognized models of care, can have a significant impact on the wellbeing and performance of nurses and nursing teams. This thesis focuses on two models of nursing care delivery, namely, team and total patient care, and their effect on nurses' wellbeing.

Objectives

To examine the effectiveness of a team nursing model compared with a total patient care model on staff wellbeing when organizing nursing work in acute care wards.

Inclusion criteria

Types of participants

Participants were nurses working on wards in acute care hospitals.

Types of intervention

The intervention was the use of a team nursing model when organizing nursing work. The comparator was the use of a total patient care model.

Types of studies

This review considered quantitative study designs for inclusion in the review.

Types of outcomes

The outcome of interest was staff wellbeing which was measured by staff outcomes in relation to job satisfaction, turnover, absenteeism, stress levels and burnout.

Search strategy

The search strategy aimed to find both published and unpublished studies from 1995 to April 21, 2014.

Methodological quality

Quantitative papers selected for retrieval were assessed by two independent reviewers for methodological validity prior to inclusion in the review using standardized critical appraisal instruments from the Joanna Briggs Institute.

Data collection

Data was extracted from papers included in the review using the standardized data extraction tool from the Joanna Briggs Institute. The data extracted included specific details about the interventions, populations, study methods and outcomes of significance to the review question and its specific objectives.

Data synthesis

Due to the heterogeneity of the included quantitative studies, meta-analysis was not possible thus results have been presented in a narrative form.

Results

The database search returned 10,067 records. Forty-three full text titles were assessed, and of these 40 were excluded, resulting in three studies being included in the review. Two of the studies were quasi experimental designs and the other was considered an uncontrolled before and after experimental study. There were no statistically significant differences observed in any study in the overall job satisfaction of nurses using a team nursing model compared with a total patient care model. Some differences in job satisfaction were however observed within different subgroups of nurses. There were no statistically significant differences in either stress or job tension. Within the selected studies, the specific outcomes of absenteeism and burnout were not addressed.

Conclusions

Due to the limited number of quantitative studies identified for inclusion it was not possible to determine whether organizing nursing work in a team nursing model or a total patient care model is more effective in terms of staff wellbeing. Neither a team nursing model or a total patient care model had a significant influence on nurses' overall job satisfaction, stress levels or staff turnover. There is an inability to ascertain if the type of model of care affects absenteeism or burnout as these outcomes were not addressed in any of the identified studies.

Implications for practice

Caution should be taken when evaluating which model of care is appropriate and the decision needs to incorporate staff experience levels and staff skill mix. There needs to be clear definition of nursing roles.

Implications for research

There is a need for further quantitative studies that are well designed with sufficient sample sizes to allow for attrition of participants, and that explore the impact each model has on nurse's wellbeing, in particular, studies that address burnout and absenteeism. Consistent terminology is required to enable future comparison and research to occur at an international level. Future studies on models of care should

include economic analysis to fully inform policy and practice.

Keywords

Total patient care, patient allocation, team nursing, nursing model, nursing care delivery system, patient care delivery system, job satisfaction, absenteeism, wellbeing, turnover, stress, burnout, sick leave, nursing staff hospital, nurses, general ward and units.

Acknowledgements

I would like to thank and acknowledge a number of significant people who without their support completion of this thesis would not have been possible.

Firstly, I would like to thank my supervisors Associate Professor Lesley Long, my primary supervisor and Dr Karolina Lisy, my secondary supervisor for their patience, advice, understanding, editing and encouragement. I could not have completed this without you two and I am extremely grateful to you both. I would also like to take this opportunity to thank all the staff and fellow students at the Joanna Briggs Institute for all of their encouragement and assistance. Thank you to Maureen Bell, research librarian with the Barr Smith Library, University of Adelaide, for her advice on searching databases

My partner, Chip, you are one of a kind. I love you and I am so grateful that we have each other. To my cat, Sox, thank you for sitting up with me into the early hours of the morning and giving me a purr and cuddle when needed. To my sister, Rae and her children, Claudia and Hamish, thanks for all the love and diversions when needed and my friend's thank you for all of your support and understanding, what a journey it has been.

To my employer, direct line manager, Su thank you for providing flexibility and allowing me to undertake this study. To my work colleagues and staff that I manage you have all inspired me to continue to question what we do to ensure that we are providing the best evidence based care for our clients and patients.

Finally, I would like to dedicate this thesis to my dear mum, Marilyn who unfortunately passed away soon after I commenced this study. Mum you encouraged me to always strive and achieve and was so supportive in my nursing career and study, thank you for always being my guiding light, love and miss you.

List of Abbreviations

| | |
|--------------|---|
| AHRQ..... | Agency for Healthcare Research and Quality |
| AIN..... | Assistant in Nursing |
| ANOVA..... | Analysis of Variance |
| CBA..... | Cost Benefit Analysis |
| CEA..... | Cost Effective Analysis |
| CI | Confidence Interval |
| CMA..... | Cost Minimisation Analysis |
| CReMS..... | Comprehensive Review Management System |
| CUA..... | Cost Utility Analysis |
| EBM..... | Evidence-based Medicine |
| EN..... | Enrolled Nurse |
| EBP..... | Evidence-based Practice |
| FTE..... | Full Time Equivalent |
| JBI..... | Joanna Briggs Institute |
| JDI..... | Job Descriptive Index |
| JIG..... | Job in General |
| IPA..... | Individual Patient Allocation |
| IWS..... | Index of Work Satisfaction |
| PA..... | Patient Allocation |
| SUMARI..... | System for the Unified Management, Assessment and Review of Information |
| MAStARI..... | Meta-Analysis of Statistics Assessment and Review Instrument |
| NICE..... | National Institute for Healthcare Excellence |
| NWSQ..... | Nursing Workplace Satisfaction Questionnaire |
| QALY..... | Quality Adjusted Life Years |
| RCT..... | Randomized Controlled Trial |
| RN..... | Registered Nurse |
| ROS..... | Range of Scores |
| SALSA..... | Search, Appraisal, Synthesis and Analysis |
| SCN..... | Shared Care in Nursing |
| SD..... | Standard Deviation |

SIG.....Stress in General
TN.....Team Nursing
TPC.....Total Patient Care

1.1 Introduction and structure of the thesis

This thesis is titled the effectiveness of a team nursing model compared with a total patient care model on staff wellbeing when organizing nursing work in acute care wards. This thesis consists of four chapters. Chapter one is an introduction to the research topic and discusses the context and need for a review, to investigate two particular nursing models of care and their impact on nurses' wellbeing. This chapter also describes systematic reviews and the importance systematic reviews have on healthcare. Chapter two presents the systematic review method which the thesis has been developed from, and includes the review objectives, types of studies, the inclusion criteria and search strategy. One of the requirements of a Joanna Briggs Institute (JBI) systematic review is the publication of an *a priori* protocol, which outlines the methods. Performed protocol was developed and published in the JBI Database of Systematic Reviews and Implementation Reports ¹ and in the international database of prospectively registered systematic reviews in health and social care PROSPERO, registration number CRD42014008768.² (Appendix I)

Chapter three presents the results of the systematic review, as published in the JBI Database of Systematic Reviews and Implementation Reports.³ This chapter includes the identified studies, their methodological quality, results as to the effectiveness of a team nursing model compared to a total patient care model on nurses' wellbeing and a synthesis of the findings. Chapter four constitutes the discussion, conclusions, implications for practice and further research in the area of nursing models and their effect on staff wellbeing when organizing nursing work in acute care wards. This thesis also includes references, acknowledgements and appendices.

1.2 Nursing Theorists

This thesis is focused on nursing care delivery models to organize nursing work. It has become apparent that the term 'model of care' can be confusing due to the way it is often poorly defined and varying ideas as to what it entails, from governance structure to the allocating of patients to nurses.⁴

A significant finding from this thesis has been there is extensive literature on models of care despite this there is a lack of theory or frameworks which incorporate the complexities of nursing care organization and this has resulted in a disjointed understanding of organizational models.⁵ Consistent and agreed terminology is required for future studies to ensure differentiation can occur between the various nursing care delivery models to enable comparison between studies.

This thesis is not about professional nursing practice frameworks or theories *per se*, but how models of care are structured and delivered and their impact on nurses' wellbeing. It is however necessary to have an understanding of how nursing care delivery models have been developed and influenced by theorist

and practice models throughout history. The term model, is widely used, and is often used in nursing to describe theories,⁶ which has contributed to difficulties in distinguishing between the two. There have been various philosophies and theorists in nursing; as McCrae 2012 states, “the legitimacy of any profession is built on its ability to generate and apply theory. While enjoying a cherished status in society, nursing has struggled to assert itself as a profession.”^{7(p.222)} Nursing has attempted for many years to gain credibility in the medical field and has undertaken educational reform in an attempt to develop the profession and bridge the gap between theory and practice.⁷

Allgood 2010 discusses, how nursing theory has been a focus for the past fifty years resulting in a broad range of nurse theorists and a variety of theoretical works.⁸ This thesis will not address all of the models and theories, it will provide a brief summary of some examples of theories that have shaped nursing over time. Arguably the most prominent figure in nursing is Florence Nightingale, whose philosophy was that there is a need to look into deeper causes of health and illness rather than the just the disease and who has provided nursing with a scientific model to continue to build on.⁹

Other influential theorists that have driven the development of nursing as a profession includes, Virginia Henderson, “known as the mother of modern nursing”^{6(p.24)} developed 14 conditions based on the following four criteria; physical, psychological, spiritual and sociological with the theory that the nurse provides the care when these needs aren’t met.¹⁰ Hildegard Peplau’s postulated a theory was based on the patient’s need for respect, dignity and the nurse needing to be aware of these needs, and she describes three phases in the nurse patient relationship; orientation, working and termination. In phase 1 the nurse introduces and obtains information, phase 2 provides care, education and counselling and phase 3 sees the patient discharged from care.⁶ The Neuman’s system model was developed in the 1970’s by Betty Neuman and views how stressors affect an individual in their environment and that these can be intrapersonal, interpersonal and extrapersonal.⁶ Dorothy Johnson’s Behavioral System Model advocates the fostering of efficient and effective behavioral functioning based on subsystems, and the nurse’s role is to restore balance.⁶

Further theorists have cemented concepts of care into fundamental aspects the profession, such as Madeline Leininger, who’s cultural care theory is based on care and transculturality and its importance in healing.¹¹ Jean Watson’s, theory is based on human caring and contains 10 carative factors and 10 assumptions related to care, with the fundamental theory being that caring is the most important function in nursing.⁶ There are many other theorists which will not be described in detail but they include nursing theories such as Imogen King’s theory of goal attainment, Dorothy Orem’s self-care theory and the dynamic nurse-patient relationship theory developed by Ida Orlando.¹¹ The final theorist which needs to be mentioned is Professor Patricia Benner who developed the ‘from novice to expert’ theory which focuses on nurse’s clinical competence.¹² These levels of experience consist of novice, advanced

beginner, competent, proficient and expert with each phase of experience the nurse builds on their knowledge and skill level and was adapted from the Dreyfus model of skill acquisition.¹³

The discussion of nursing theorists leads to practice models. Nursing uses terms such as patient care delivery model, professional practice model, integrated delivery system and nursing professional practice model interchangeably and many are often unsure of the definitions; nurses therefore find it difficult to articulate their meaning.¹⁴ The elements of what constitutes a nursing model is described by Pearson et al. 2005 as components and elements which describe what nursing is; the theories, concepts, beliefs, values, goals, knowledge and skills required.¹⁵ Chamberlain et al. 2013, discuss that organizations should select a nurse theory based on the vision and values of the organization.¹⁴ Due to the confusion and interchangeable terminology, nursing staff will need education to ensure they have an understanding of the theory and are able to define the “practice model and care delivery system that’s congruent with its philosophy.”^{14(p.18)}.

In summary, this thesis acknowledges the difference in practice models and care delivery systems and supports the idea that a care delivery system is influenced by the model of practice¹⁵ and is not a practice model but a model of work organization. Practice models and frameworks will be explained further in the discussion section of this thesis. The next section describes the context of the review and common nursing care delivery models which organize nursing work, focusing in particular on a team nursing model and a total patient care model and how these two models affect nursing wellbeing.

1.3 Context of the review

The organization of the work of nurses, according to recognized models of care, can have a significant impact on the wellbeing and performance of nurses and nursing teams. A model of care as described by Fowler, Hardy and Howarth, is the definition used for the review and thesis; they define model of care as the:

“Provision of care in an organizational setting, specifically at a clinical services unit level (ward)...Presents the structural and contextual dimensions of nursing practice...Governs the manner in which nurses organize work groups, communicate with work group members and with other disciplines, interact, make decisions, and create an environment within which nursing care is delivered among care providers, and specify communication and coordination patterns necessary to support care.”^{4 (p.40-41)}

There are four dominant traditional nursing care models described in the literature to organize nursing work: team nursing, total patient care (also known as patient allocation), task method, and primary nursing.¹⁶ These models are internationally recognized models of nursing care delivery and commonly applied in acute care hospital settings to organize nursing work. In recent years there has been the emergence of other models as well as various combinations of different models.

Shields 2002 describes that nursing models assist in organizing nursing as a coherent whole and defines what nurses do and how they do it.¹⁷

In Australia, individual total patient care is the main model used.¹⁸ Team nursing is also a prominent care delivery model used in acute care ward settings whereas task allocation and primary nursing is not as commonly used. The model of nursing selected is dependent on nursing resources and patient care requirements. Tiedeman and Lookinland 2004 state that models “differ in clinical decision making, work allocation, communication and management, with differing social and economic forces driving the choice of model.”^{19(p291)} As team nursing²⁰ and total patient care are common models used in Australia,²¹ these are the two models of interest in this review.

1.3.1 Team nursing model

The team nursing model of care is where a group of nurses work as a team to deliver the care. This model utilizes the diversity of skills, and education and qualification levels of each team member. The team works collaboratively with shared responsibility.¹⁸ This model usually relies on a team leader who is a registered nurse. It is important that the team leader has effective communication and leadership skills.²² The team leader needs an established skill set and must be able to supervise staff, as staff satisfaction is linked to supervision.²³

1.3.2 Total patient care model

The total patient care model is where one nurse is allocated a group of patients for that shift; however continuity of care is not followed through from admission to discharge as the patients are allocated on a shift-by-shift basis.^{16,18} Registered Nurses (RN), Enrolled Nurses (EN) or Assistants in Nursing (AINs) may be allocated to total patient care, but an RN would usually oversee the care. The first report on the models of care project by the New South Wales Department of Health discusses that total patient care is the main model utilized since nursing moved to the tertiary sector in Australia and that many graduates have only been educated in total patient care.²¹

1.3.3 Task nursing model

Task nursing allocation (also known as functional nursing) is defined by Thomas et al, (1990) in Pearson et al.¹⁶ as the “division of nursing work into separate tasks, where tasks are allocated according to skill level, while the nurse in charge retains responsibility and accountability for the totality of patient care.”^{16(p. 14)} This model of care has a hierarchical structure and relies on the nurse in charge to assign tasks based on an individual’s level of education.²⁴ Tiedeman and Lookinland 2004 describe that this model of care was popular in the 1950’s and 1960’s and had been taken from the manufacturing industry as a task specialization in an assembly line approach was seen as effective.¹⁹

1.3.4 Primary nursing model

Primary nursing involves the allocation of a patient to a nurse from the time of admission through to the

time of discharge. “The primary nurse assumes 24-hour responsibility and accountability for assigned patients for the duration of their hospital stay and has the responsibility and authority to assess, plan, organize, implement, coordinate, and evaluate care in collaboration with the patients and their families.”^{19(p 295)} Further described by Sellick et al. 2003 as an organizational care model with the focus on comprehensive, continuous, individualized care by the nurse who has the autonomy and authority to implement that care.²⁵

Nurses provide service delivery across all healthcare settings, therefore managers need to ensure that the models of care delivery maximize this valuable resource as nurses are critical to the organizational performance and in ensuring safe high quality care is delivered.⁵ In Australia and internationally, the nursing workforce has changed considerably due to multifactorial influences such as budgetary constraints, hospital restructuring, an aging workforce, advanced practice roles for registered and enrolled nurses, changes in scope of practice, skill mix and introduction of undergraduate nurses, recruitment and retention of staff and increases in complexity of care.^{26,27} The model of care chosen to organize nursing work needs to accommodate all these influences. The model of care delivery and the effects on patient care have been discussed in the literature and those models with a greater registered nurse skill mix have been linked to improved outcomes, such as lower patient mortality and wound infections, and reduction in medication errors.²⁸ The focus of the review was on nursing care delivery based on one of two particular models: team nursing and total patient care, and the effect these care models have on nurses’ wellbeing. The reviewer acknowledged the importance of measuring patient clinical outcomes and organizational factors to inform the delivery of safe and cost effective clinical care; however those outcomes were excluded from the review as there have been previous reviews to inform practice in this area.²⁹⁻³¹

The model of care is critical in defining the nursing work environment. Nursing work environments are complex; prioritizing work is essential and the need to reprioritize nursing workloads on a daily basis is often necessary. Research has shown that nursing work environments and also job satisfaction are influenced by organizational structures, leadership, autonomy, models of care, multidisciplinary collaboration and interpersonal relationships.^{20,32} Nursing organizational models vary in terms of scope of practice, environment and staffing patterns and this can be as a result of nursing care restructuring.⁵

Ward areas may adapt different models of care due to the knowledge and skill level of staff, to influence teamwork or to increase job satisfaction. Organizations need to manage within allocated resources and ensure that they have the most appropriate model to support staff and ensure safe, effective clinical outcomes. Regardless of the model of care, all nursing staff are required to work within their scope of practice and have an understanding of their colleague’s roles and responsibilities. Confusion with scope of practice leads to conflict, inter-professional rivalry and even bullying.³³ Due to the global shortage of nurses and skill mix issues, it is important to ensure the organizational model in the clinical area utilizes the skills and experience of the available staff.

1.3.5 Skill mix

Skill mix in this thesis refers to a classification of nurse employed for the provision of care. The overall goal of a skill mix model is to allow for flexibility whilst achieving the most cost effective use of health professionals, and the major influence on skill mix is financial implications.³⁴ Due to nurses providing 24 hour care, their wages constitute a large proportion of hospital budgets. As a result, hospitals may reduce nursing staffing as a way to reduce costs and increase profitability.³⁵ Other options include re-engineering or redesigning the work which occurs through multiskilling the staff and developing their knowledge to take on roles beyond their area of expertise,³⁴ and reducing registered nurse skill mix. There are various skill mix combinations, including 100% registered nurses, and combinations of registered nurses with either licensed nurses, nurses' aides and/or unlicensed assistants.³⁴ When determining the most sufficient number and mix of nursing staff, patient safety and care must be the priority for decision makers.³⁶ Studies have indicated that the lower the level of professional nurses the higher the incidence of adverse patient outcomes.³⁷ In McGillis et al. 2004 it was discovered that the lower the nurse staffing skill mix the higher the number of nursing hours used.³⁷ This in conjunction with the negative effects on patient outcomes with a decreased staff skill mix, would indicate that it may not be a cost effective strategy to reduce registered nurse skill mix. Tiedeman and Lookinland 2004, describe that there are varying views regarding costs of nursing models. ¹⁹ Therefore, chapter 4 expands on the discussion of cost effective care and the requirement for further studies to focus on an economic analysis of skill mix, nursing models and their effects on patient and nurse outcomes.

1.3.6 Re-designing nursing work

These is an increase in patient complexity, acuity and chronic disease, as a result of this patients require skilled nurses to care for them. A strategy organizational leaders may use to in an attempt to control costs and manage workforce demands such as nursing staff shortages is to re-design the work that nurses perform.³⁸ This may include substituting experienced nurses for unskilled workers. ³⁸ Duffield and O'Brien-Pallas 2003 advise that "it may be counterproductive to employ unskilled workers as this may well increase the workload and dissatisfaction of registered nurses, leading to an even greater shortage of nurses long term."³⁸ (p.196) It has been argued that nursing models need to be reflective of current workforce issues such as a reduction in registered nurse availability and increase in patient acuity.³⁹ As discussed there is a need to deliver cost effective health care without compromising patient safety and care. There are advances in pharmaceuticals, constant changes in technology and an ageing population which has seen health care expenditure continue to increase.⁴⁰ In the discussion section of this thesis restructuring, and realignment of services and the impacts on nursing work force is discussed further.

1.3.7 Scope of practice

The Australian Nursing and Midwifery Council 2007 describe scope of practice of a profession and of an individual. A scope of practice of a profession is described as "roles, function, responsibilities, decision

making capacity and functions that professions are educated and authorized to perform.”^{41(p. NP)}

The scope of practice of an individual is described as “that in which the individual is educated , authorized and competent to perform.”^{41(p.NP)} Nurses Scope of practice may be specifically defined to a certain area of practice they may need to undertake further knowledge and skills to be competent to practice within the full scope of practice of the profession.⁴¹

Nurses’ roles and responsibilities continue to change due to financial constraints and workforce shortages, as a result nurses’ need to be clear of the scope of practice of all those in their team to ensure that roles and responsibilities are unambiguous.³³

When allocating or assigning staff to care for patients, there is an assumption that the care is within the individual’s normal responsibility and scope of practice. Delegation is different to allocating patients as when delegating aspects of care there is a need to ensure that the person being delegated to, is competent to perform the care. The person delegating the care retains accountability and needs to monitor the outcome of the care delegated.⁴²

1.3.8 Job satisfaction

Lu et al. 2005 discusses how job satisfaction is the most studied topic in organizational behavior. They describe that the traditional model focuses on a person’s feeling about their job, however what makes a job either satisfying or dissatisfying not only depends on the nature of the job but also the expectations of what the job provides.⁴³ Job satisfaction impacts on many layers of the nursing workforce including absenteeism, stress, burnout and nursing turnover.

1.3.9 Stress and burnout

Workplace stress and burnout have implications for both the employee and the organization regardless of the workplace. Jennings 2008 citing Lazarus who described stress as a “relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her wellbeing.”^{44(para1)} If high stress levels are maintained this could result in burnout. Burnout can be defined as physical or mental collapse caused by overwork or stress.⁴⁵ In nurses, stress and burnout can have long standing implications for health and job satisfaction of the nurse, and for the employer it can influence turnover and absenteeism.⁴⁴ In addition, stress and burnout have implications for patient care and with higher levels of burnout, nurses reported quality of care as lower as described in Poghosyan et al 2010, which is a study of nurse burnout and quality care across six countries.⁴⁶

1.3.10 Absenteeism

Healthcare organizations depend on their workforce. Nurses are essential to care delivery and if they are absent from work this can effect quality of care and have financial implications for the health care organization.⁴⁷ Davey et al. 2009 in their systematic review investigating absenteeism in hospitals

discuss that burnout and job stress increases absenteeism, although there is no conclusive evidence regarding nurse absenteeism specifically.⁴⁸ Thus, with this uncertainty, problems and costs associated with absenteeism will likely continue.⁴⁸ Absenteeism may compromise patient care and increase workload of other nurses' as the unplanned leave may not be replaced or a less experienced nurse who is unfamiliar with the area may be provided. This can also have a negative effect on the other nurses due to increased workload resulting in increased absenteeism in the nursing team.⁴⁹

1.3.11 Turnover

Recruitment and retention of nurses is important and there is a need to understand the factors that influence turnover however currently there is no universal definition to measure and determine nursing turnover.⁵⁰ This is further supported by Hayes et al. 2012 who describe that inconsistencies in definitions of nursing turnover and methodological differences limit the ability to measure and compare turnover, and that studies focus on intent to leave when further studies are required on the cost to the system and impacts of patient and staff outcomes.⁵¹ High turnover and the nursing shortage is of concern in many countries as it impacts on the effectiveness and efficiency of health care delivery systems.⁴³

1.4 Introduction to systematic reviews

This thesis is based on a systematic review of the effectiveness of a team nursing model compared with a total patient care model on staff wellbeing when organizing nursing work in acute care wards. A systematic review was undertaken to ensure that there was a transparent, reproducible and systematic approach to the identification and synthesis of the evidence. Systematic reviews include well-defined, reproducible methodology covering the comprehensive search strategy, study selection, critical appraisal, data extraction and data synthesis.⁵²

Due to the nature of the research topic and methodological approach, the Joanna Briggs Institute (JBI) systematic review process was used as JBI has a strong focus on healthcare. JBI has developed systematic review tools to assist healthcare professionals to conduct systematic reviews of the best available evidence, and the results can then inform clinical practice through evidence-based recommendations for practice and further research.⁵²

1.4.1 Characteristics of a systematic review

Systematic reviews are designed to answer specific research questions and as previously mentioned an *a priori* protocol should be developed prior to undertaking such reviews. The protocol development involves the construction of a specific research question, of which there is a need to check that there are no current or impending systematic reviews on that specific topic. The title of the review should then be registered to avoid duplication of the review. The protocol includes set parameters which include type of participants and participant characteristics, the intervention, comparator and outcomes of interest. The review protocol also includes how the methodological quality of studies will be assessed, how data will be extracted and methods of synthesis for data extracted.⁵²

Following development of the question and the *a priori* protocol, a comprehensive search is undertaken to identify all relevant published and unpublished evidence, and the retrieved citations are screened for inclusion into the review. The studies selected must meet the review inclusion criteria set out in the protocol.⁵³ Methodological quality is assessed via critically appraisal of all papers by two independent reviewers using a validated checklist, and data is then extracted from the included studies and synthesised.⁵⁴ Results are obtained and then conclusions and recommendations for research and practice are made.^{52,53}

1.4.2 Types of systematic reviews

There are various forms of reviews; Grant and Booth 2009 identified 14 review types and associated methodologies mapped against the Search, Appraisal, Synthesis and Analysis (SALSA) framework.⁵⁴ The Joanna Briggs Institute describes the following systematic reviews of evidence include; quantitative evidence, qualitative evidence, economic and text and opinion based evidence. Comprehensive reviews may include two or more of these forms of evidence, these are further described below. Due to the need for reviews of different types of evidence, JBI has recently developed methodologies for umbrella reviews, scoping reviews, reviews of prevalence and incidence, aetiology, and reviews of diagnostic test accuracy.

1.4.2.1 Quantitative evidence

The research topic presented in this thesis was addressed using quantitative evidence. In quantitative evidence when studies are performed using the same measurements, the same result/s are expected to be achieved repeatedly, as the strength in quantitative evidence is in the fact that it is reliable,⁵² when using a valid methodological approach. The effectiveness of an intervention depends on how the intervention achieves the desired result, in terms of clinical effectiveness and its relationship between the intervention and the clinical outcome.⁵² Experimental and observational studies are the two main research designs for collecting quantitative data and making measurements. Experimental studies are when there are two or more variables and one of these variables is manipulated by the researcher and the effect on the other(s) is studied. Observational studies infer there is a relationship between the variables. Quantitative evidence in terms of history and paradigm is outlined further in the thesis.

1.4.2.2 Experimental study design

An experimental design is considered the ideal study design, however due to reasons such as ethics an experimental design may not be practical.⁵⁵ In terms of experimental designs randomized controlled trials (RCTs) are the best evidence as many variables, (such as in ideal RCTs with randomizing participant selection), are controlled and thus the intervention alone is responsible for the difference in outcome.⁵⁵ Quasi-experimental or non-randomized studies aim to discover a relationship between two variables. Participants are not randomized and due to less control of the variables, there is an increased risk of bias and interpretation of results careful consideration as other factors may influence the result other than the intervention.⁵²

1.4.2.3 Observational study design

Observational study designs are used extensively in healthcare research, and are used when it is not appropriate to use experimental designs due to ethical considerations.⁵² Correlational and descriptive designs are common observational studies. Correlational studies summarise associations between variables and include cohort and case-control studies.⁵² Cohort studies can be prospective or retrospective. Case-control studies use retrospective study designs, 'case' referring to participants who have a particular condition compared to those in the 'control' who don't.⁵⁵ Descriptive designs do not aim to determine a relationship between variables but look at basic information, for example prevalence of disease.^{52,55} In addition, JBI acknowledge that expert opinion may be the best available evidence when no research evidence exists.⁵²

1.4.2.4 Qualitative evidence

Qualitative enquiry enables analysis of human experience, and cultural and social phenomena.⁵⁶ Action research, phenomenology, ethnography, grounded theory, feminist research and discourse analysis are qualitative research methodologies.⁵² Qualitative methods are valuable in health care as these methods allow for a greater understanding and insight into individuals' experiences. Data is collected for qualitative evidence from a range of methods including interviews, reflective journals, focus groups, group work and field observations.

1.4.2.5 Economic evidence

In healthcare the costs also need to be considered as well as the health effects.⁵² Health economic evaluation is described by Annemans 2008 as a "comparative analysis of both the costs and the health effects of two or more alternative health interventions."^{57(p8)} Evaluation of costs occurs through four methods of cost analysis, three of these are full economic evaluation and these include cost-effectiveness analysis (CEA), cost-utility analysis (CUA) and cost-benefit analysis (CBA). The CEA compares not only the costs of interventions but also the outcomes or effects. A CUA measures the monetary cost by outcome of study or quality adjusted life years (QALY). In a CBA the cost of the intervention and the outcome are measured. A cost-minimization analysis (CMA) is a partial economic analysis and as the benefits and the consequences are assumed the same therefore cheapest option is preferred.⁵²

1.4.2.6 Text and opinion-based evidence

Text and opinion-based evidence refers to expert opinions, commentaries and views that are presented in various sources such as journals, magazines and reports. Expert opinion may be the best available evidence when there are no research studies.⁵² It is also important that it is declared that the evidence is opinion-based, to ensure that those who are reviewing the evidence are able to make their own conclusions regarding the validity of what is presented.⁵²

1.4.2.7 Comprehensive reviews

A comprehensive review is when two or more forms of evidence are included in the review, types of evidence may include quantitative, qualitative, textual or a health economic evaluation.⁵²

1.5 Science of statistical synthesis

As this thesis is based on a quantitative review it is important to have an understanding of the history of quantitative methods. According to O'Rourke 2007, it was not until the 20th century that this began to occur in medicine with the combination of clinical trial results.⁵⁸ One of the first examples is Karl Pearson, a British statistician who compared infection and mortality in soldiers who were inoculated against typhoid compared to those who were not, and this required regrouping of study observations. Karl Pearson is considered the first person to analyze clinical trials using meta-analysis.⁵⁸ At the time it was not known as meta-analysis; this would not occur until Glass's work. Gene Glass in 1976 published his work titled, 'primary, secondary, and meta-analysis of research,'⁵⁹ where he first described the term meta-analysis. Glass 1976 defines meta-analysis as combining study findings and a statistical approach to combining these results.⁵⁹ Below is a discussion around paradigms and explains which paradigm statistical synthesis aligns to.

1.6 History of research methodology paradigms

A paradigm can be described as a way of viewing the world.⁶⁰ Explained further by Guba and Lincoln 1994, a paradigm is a "set of basic beliefs (or metaphysics) that deals with ultimates or first principles. It represents a worldview that defines, for its holder, the nature of the "world," the individual's place in it, and the range of possible relationships to that world and its parts."⁶¹ (p.106). Four common paradigms for research methodologies are positivist, interpretivist, radical and post-structural paradigms.⁶² Scotland 2012, explains that there are four components to a paradigm; the ontology, epistemology, methodology and methods. He describes these individually as ontology constituting reality of what is, epistemology involves how knowledge is acquired and communicated, methodology questions the why, what, where, when and how data is analyzed and collected and finally methods is the specific techniques used to collect and analyze the data.⁶³

In the 19th Century Auguste Comte developed the term positivism; this paradigm emphasized the need for systematic, objective, detailed observation and testing hypotheses through experimentation.⁶² Grant and Giddings 2002, discuss how the interpretive paradigm looks at what it means to be human and the meanings people attach to events. The interpretive paradigm sees the positivist view as a reductionist approach to the human experience. They describe with the radical paradigm that there are two social theories which relate to the paradigm, one being critical social theory the other the feminist theory, although not all feminist theory belongs in this paradigm as feminist poststructuralism is a post-structural paradigm. The radical paradigm is concerned with inequalities and injustices and the need to do

something about this, examples of these inequalities includes gender, sexual preference, ethnicity and class.⁶² Grant and Giddings 2002, discuss that the poststructuralist paradigm is also known as deconstructivism or post postmodernism. They explain that they refer to this paradigm as poststructuralist as they feel that the term postmodernism describes a historical era. This paradigm 'rests on the assumptions that no-one can stand outside the traditions or discourse of time.'⁶² (p.20).

Positivism refers to a rational and empiricist philosophy that originated with such names as Aristotle, John Locke and as mentioned previously Auguste Comte.⁶⁰ Lockwood et al. 2011, describes that the positivist paradigm is concerned with quantitative theory and aims at controlling the physical world and is different from that of a subjective, qualitative or personal experience.⁵⁵ With this paradigm and scientific method of experimentation and adherence to utterly objective, accurate and valid scientific knowledge, positivism is lacking in terms of applying human behaviours.⁶⁰ In the late 1960's the rigid view of positivism was challenged by people such as the physicist and philosopher Thomas Kuhn with the postpositivist view that researchers are influenced by cultural, political and social circumstances.⁶²

1.7 Narrative synthesis

Narrative synthesis "is an approach used in systematic reviews to synthesise findings from studies and relies on the use of words and text to summarise and explain the findings of the synthesis."⁶⁴(p.5) Narrative synthesis should not be confused with narrative reviews which often lack a sound methodological approach. These are considered the more traditional literature review and they are not transparent or systematic in the synthesis process.⁶⁵ At times it is not possible to combine data through meta-analysis in quantitative reviews, therefore a narrative synthesis may be required.

1.8 Evidence-Based Practice (EBP)

As discussed this thesis is based on a quantitative review, therefore this section will focus on evidence-based practice in terms of quantitative evidence. In health care the Greek physician Hippocrates' view of disease conditions is considered the earliest form of empiricist view, and this continued with the very rationalistic views of Galen (Claudius Galenus).⁶⁶ Parker 2005 also comments that this empiricist view continued through the Dark and the Middle Ages due to Christianity belief in god and the ancient authority of Hippocrates and Galen. This also influenced the medical profession which became elitist and only those trained through the universities were accepted and other healing modalities were excluded or devalued.⁶⁶ This view then changed with the emergence of the Renaissance when tradition was questioned which was due to threats to public health such as bubonic and syphilitic plague, although in the 17th century there was still a reliance on the empirical view even with clear contradictory evidence.⁶⁶ In the late 20th Century the move to evidence-based practice really began. In the 1970's Archie Cochrane published the book 'Effectiveness and Efficiency: Random Reflections on Health Services', within which he criticized the lack of reliable evidence behind accepted healthcare interventions, highlighting the need for evidence-based medicine practices. He also discussed the need

for a collection of systematic reviews of randomized controlled trials, and this led to the establishment of the Cochrane Collaboration.⁶⁷ The Cochrane Collaboration was established in 1993 under the guidance of health researcher Iain Chalmers.

As the term evidence-based medicine (EBM) was first described by Dr. Gordon Guyatt in 1991.⁶⁸ His mentor was Dr. David Sackett and they had been using critical appraisal techniques at the bedside. He originally termed this scientific medicine to describe the residency curriculum, however his colleagues did not approve of this term, so he created the term evidence-based medicine.⁶⁸ Evidence-based medicine has been well described by Sackett et al. 1996, as “the conscientious, explicit and judicious use of best current evidence in making decisions about the care of individual patients...integrating individual clinical expertise with the best available external clinical evidence from systematic research.”⁶⁹ (p.71) These authors also discuss that systematic reviews do not need to be randomized controlled trials or contain meta-analyses but identify the best external evidence to answer a clinical question.⁶⁹

In the nursing profession, the concept of improving patient outcomes through evidence can be traced back to Florence Nightingale's ⁷⁰ and her work on how the environment affected patient's health. The International Council of Nurses 2012, describe evidence based practice as “a problem solving approach to clinical decision making that incorporates a search for the best and latest evidence, clinical expertise and assessment, and patient preference values within a context of caring.”⁷¹ (p.6) There has been significant literature produced on the benefits of evidence based practice in nursing, and the need to develop evidence based guidelines to inform practice.¹⁵

Grant and Giddings 2002, discuss that evidence-based practice is an example of a positivist approach to knowing, and that research has focused on systematic reviews to highlight best practice, which becomes the gold standard which is assumed will then lead to excellent care.⁶² They also discuss that randomized control trials (RCT's) produce the best evidence. Lockwood et al. 2011, discuss that systematic reviews evolved from the positivist paradigm.⁵⁵

It is important to note that there are a vast number of healthcare publications and clinicians need to be able to interpret and assess the validity of these in order to make validated and credible changes to practice and care.⁷² There are up to two million articles published a year across the healthcare professions and with the internet health professionals and consumers need to ascertain what is good quality information.⁵³ Reviews feature widely in healthcare literature however they may not be systematic reviews which have a peer-reviewed protocol, may not include an assessment of the quality of included studies and synthesis may not be thorough, therefore there needs to be a clear process and rigor around the systematic review process.⁵³ The increasing amount of healthcare literature also applies to systematic reviews with the establishment of various repositories for systematic reviews such as the

Cochrane Collaboration, Joanna Briggs Institute, National Institute for Healthcare Excellence (NICE) and Agency for Healthcare Research and Quality (AHRQ).⁷³

1.9 Why undertake a systematic review

The purpose in undertaking the review was to compare the effectiveness of a team nursing model and a total patient care model through evaluating which model of care achieves greater staff wellbeing. Staff wellbeing was measured by staff outcomes in relation to staff satisfaction, turnover, absenteeism, stress levels and burnout. The review focused on the acute care hospital sector and in particular general ward settings. To avoid potential duplication of the proposed review topic, searches of the Joanna Briggs Institute Database of Systematic Reviews and Implementation Reports and the Cochrane Library for recent or underway reviews on similar topics were undertaken. The searches revealed that a systematic review by Fernandez, et al.³¹ had recently been published on a similar topic and it looked at various models of care and the effects those models had on staff such as staff satisfaction, role clarity and absenteeism, and on patient outcomes in terms of nurse sensitive indicators, such as falls, medication errors and infection rates. The review included some of the outcome measures reported in Fernandez, et al.³¹ but extended the outcomes to include turnover, stress and burnout and narrowed the focus to two models of care delivery. The purpose of replicating some of the outcome measures of staff satisfaction and absenteeism was to extract a clear picture of the differences in the two care models, team nursing and total patient care. There have been quantitative and qualitative reviews conducted on nursing models and the effects on patient, organizational and staff related outcomes,²⁹⁻³¹ but none had narrowed the focus to these two models and their direct effect on staff wellbeing.

It was hoped that a quantitative systematic review would assist in informing practice regarding these two care delivery models team nursing and total patient care by establishing the effect that each model has on the nurses delivering them. The role of the RN includes delegation and this requires an understanding of other team members' scope of practice, education level and experience. In Australia, there are a number of new hospitals being constructed or under redevelopment and the intent was for the review to assist in informing practice on the preferred model of care. The review also looked at the impact of a team nursing model and a total patient care model on staff wellbeing from a global perspective to ensure best available studies which meet the criteria were included in the review. As mentioned the objectives, inclusion criteria and methods of analysis for the review were specified in advance and documented in an *a priori* protocol.^{1,2}

The advantage of the systematic review was that it was conducted according to a *a priori* protocol using the Joanna Briggs Institute System for the Unified Management, Assessment and Review of Information (JBI-SUMARI) software. Specifically, this systematic review utilised the Joanna Briggs Meta Analysis of Statistics Assessment and Review Instrument (MAStARI), which is a reliable proven methodological tool

which enables the critical appraisal and extraction of data from the included studies. As discussed in Tricco et al 2008, the use of developing protocols for systematic reviews is important as protocols minimise the risk of bias, as results are not known prior to developing the methods and hypothesis. The authors also discuss that a cross sectional survey revealed that only 46.3% of published systematic reviews report using a protocol.⁷⁴

1.10 Statement of the review question

Is a team nursing model or a total patient care model approach the most effective model of care when organizing nursing work to achieve desired staff wellbeing (defined by outcomes of job satisfaction, stress, burnout, absenteeism and turnover) in acute care wards?

1.11 Defining the terms

It is important when undertaking a systematic review that the papers clearly define what is being measured. This has been one of the limitations in undertaking a review into this topic because of the lack of common terminology and definitions. The terms and measures used in this review are:

1. Nurse turnover which includes voluntary and involuntary termination, as well as internal and external transfers.⁷⁵ Voluntary termination may include transferring from one department to another within the same organization or when nursing staff voluntarily leave or transfer from their employment position. Voluntary termination excludes dismissals, voluntary retirement and leaves of absence as a result of death, medical or maternity reasons or end of contractual agreements.⁷⁶ Involuntary termination is where employment is terminated by the employer. Many studies do not distinguish between voluntary and involuntary turnover, therefore for the purpose of this study nurse turnover will be defined as the process in which nurses leave or transfer within the hospital environment.
2. Absenteeism (unplanned absence) in this review is defined as non-attendance at work where work attendance is scheduled. This includes sick leave, and may include carer's leave and bereavement leave. This leave may be paid or unpaid.⁷⁷ Work related injury leave was excluded.
3. Nurse stress is defined as the "relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her wellbeing."^{44(para1)}
4. Nurse burnout is the physical or mental collapse caused by overwork or stress.⁴⁵
5. Skill mix is the combination or grouping of different categories of workers that are employed for provision of care to patients.³⁴ Categories of workers for this review specifically refers to nursing staff employed for provision of care.

This chapter presents the systematic review method which the thesis has been developed from and includes the review objectives, types of studies, the inclusion criteria and search strategy. One of the requirements of a Joanna Briggs Institute (JBI) systematic review, is the publication of an *a priori* protocol which will be discussed.

2.1 Review question and objectives

The objective of the systematic review which informed this thesis was to critically appraise and synthesize the best available evidence on the effectiveness of a team nursing model compared with a total patient care model on staff wellbeing when organizing nursing work in acute care wards. The review sought to answer the following question:

Is a team nursing model or a total patient care model approach the most effective model of care when organizing nursing work to achieve desired staff wellbeing (defined by outcomes of job satisfaction, stress, burnout, absenteeism and turnover) in acute care wards?

2.2 Inclusion criteria

2.2.1 Types of studies

Quantitative studies that focused on but were not limited to staff turnover, absenteeism, staff satisfaction, stress and burnout were considered for inclusion in the review. Experimental and epidemiological study designs, including randomized controlled trials, non-randomized controlled trials, quasi-experimental, before and after studies, prospective and retrospective cohort studies, case control studies and analytical cross sectional studies, were considered for inclusion.

The review also considered descriptive epidemiological study designs, including case series, individual case reports and descriptive cross sectional studies, for inclusion.

2.2.2 Types of participants

The review considered studies that included all nurses working on general wards in the acute care hospital sector. This included registered general nurses or the international equivalent, such as staff nurse and professional nurse; enrolled nurses or the international equivalent, such as licensed vocational nurse or licensed practical nurse; and unlicensed personnel, such as nursing assistants or the international equivalent, such as nurse's aide and auxiliary nurses.

Excluded from the review were: Nursing staff working on specialized wards and areas, for example, intensive/critical care areas, oncology wards, pediatrics, midwifery, mental health, primary care and aged care sectors, as they use specific models of care for their scope of practice.

2.2.3 Type of intervention and comparator

The review considered studies that investigated the use of a team nursing model when organizing nursing work. The comparator was the use of a total patient care model.

2.2.4 Types of outcomes

The primary outcome of interest to the review was staff wellbeing. Data collection tools included questionnaires for the collection of responses for staff satisfaction. As staff satisfaction and job satisfaction are used interchangeably in the literature, outcomes which referred to job satisfaction were included. Validated and reliable measurement tools were utilized in the selected articles to measure staff burnout and stress levels. Nursing turnover and absenteeism rates were also extracted from the included papers. Patient clinical outcomes were not considered the review, as the focus was on nurse outcomes.

2.3 Search Strategy

The search strategy aimed to find both published and unpublished studies. A three-step search strategy was conducted for the review. An initial limited search of PubMed and CINAHL was undertaken followed by an analysis of the text words contained in the title and abstract, and of the index terms used to describe the article. A second search using all identified keywords and index terms was then undertaken across all included databases. See (Appendix II) for the complete search strategy. Initially, MedNar database was included in the search strategy; however following consultation with the research librarian, MedNar was omitted due to an inability to achieve specificity in the search results.

The databases searched were:

- CINAHL
- PubMed
- Cochrane Library (CENTRAL)
- Scopus
- Embase
- Science Direct.

The search for unpublished studies included:

- ProQuest Dissertations and Theses.

Thirdly, the reference lists of all identified reports and articles were searched for additional studies. Studies published in the English language from January 1, 1995 to April 21, 2014 were considered for inclusion in the review. In order to analyze the most current and contemporary body of evidence, the review only considered published articles from 1995 onwards. To justify this time period it is critical to reflect upon the changes that have occurred within the nursing profession in relation to a number of

influences including nurse education, changes in health acuity, workforce demands and the introduction of new nursing roles into the acute care health workforce. These influences have greatly affected and influenced models of care delivery. Studies prior to this period of time, considering the significant movements and changes in workforce dynamics would be superfluous to the outcomes of the systematic review.

2.4 Assessment of methodological quality

Quantitative papers selected for retrieval were assessed by two independent reviewers for methodological validity prior to inclusion in the review using standardized critical appraisal instruments from the Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument (JBI-MAStARI). Due to the limited availability of studies in the literature, it was decided not to exclude papers based purely on quality. The studies were grouped into randomized controlled trials/pseudo-randomized trials, comparable cohort/case control studies or descriptive/case series studies to enable the reviewers to assess methodological quality (see Appendix III). A third reviewer was not required as there was consensus amongst the two reviewers.

2.4.1 Data collection

Data were extracted from papers included in the review using the standardized data extraction tool from JBI-MAStARI (Appendix IV). The data extracted included specific details about the interventions, populations, study methods and outcomes of significance to the review question and specific objectives; see (Appendix V) for tabulated characteristics of included studies

2.4.2 Data synthesis

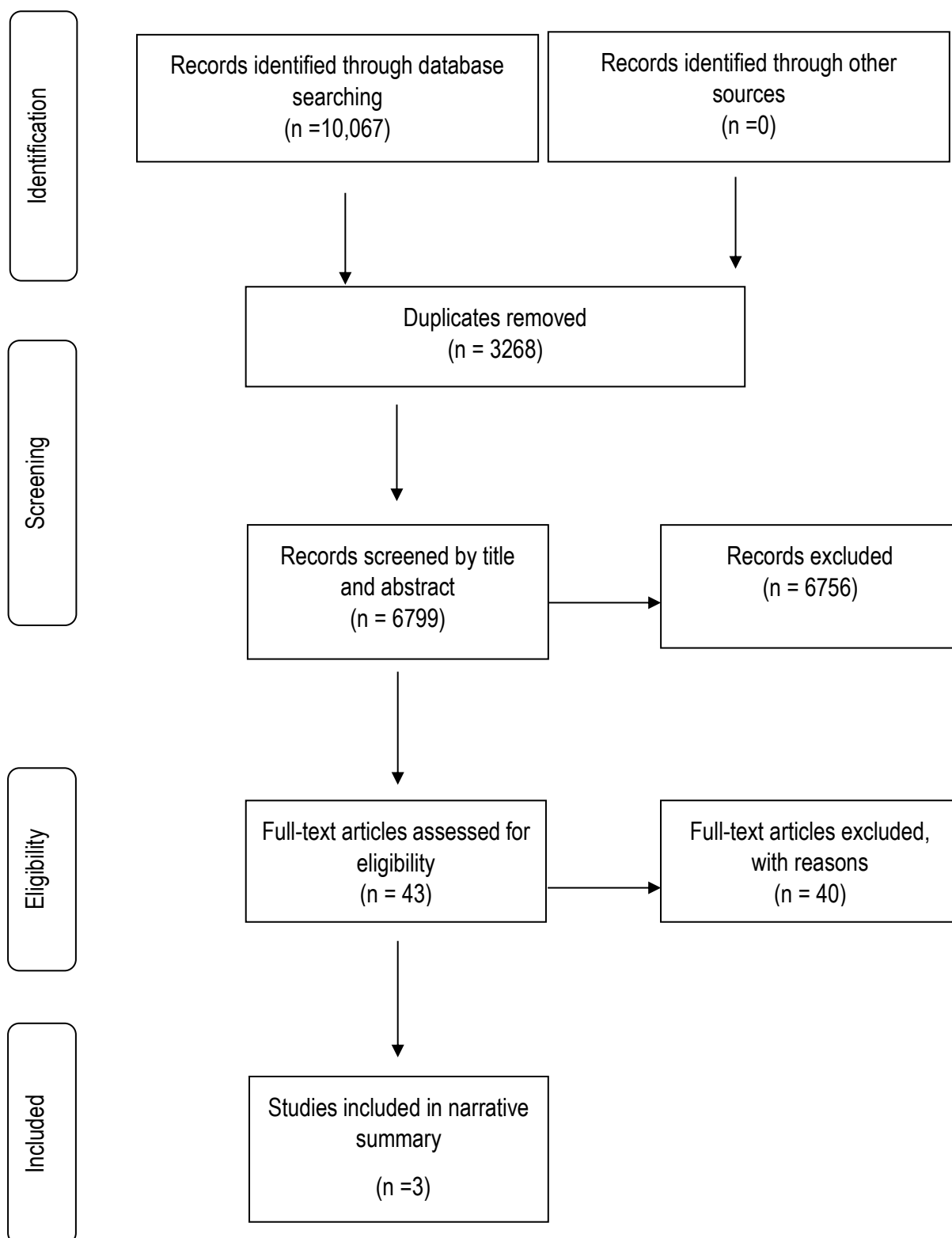
There was significant methodological, clinical and statistical heterogeneity in the included studies, with differences in study designs, outcome measures and statistical analyses. Due to this heterogeneity, meta-analysis was not possible and results from the review have been presented in a narrative form, in the result section.

This chapter outlines the results of the systematic review, as published in the JBI Database of Systematic reviews and Implementation Reports.³ This chapter includes the identified studies, their methodological quality, results as to the effectiveness of a team nursing model compared with a total patient care model on nurses' wellbeing and a synthesis of the findings.

3.1 Search and study selection

A comprehensive search of electronic databases was performed. The database search returned 10,067 records (Figure 1). A total of 3268 duplicate records were removed resulting in 6799 papers that were screened on the basis of title and abstract, and of these 6756 were considered ineligible for inclusion in the review.

Forty-three full text titles were retrieved and assessed for eligibility for inclusion in the review. Forty articles were excluded and rationale for their exclusion documented (Appendix VI). This resulted in three articles being included in the review. Reference lists of included studies (Appendix VII) were screened for further potentially relevant articles; however no further studies were identified that met the inclusion criteria.



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

Figure 1 - Study identification process

3.2 Methodological quality

Three studies were selected for inclusion in the review and their methodological quality assessed using the JBI critical appraisal tool for randomized/pseudo-randomized controlled trials (Table 1). Although Wells et al.⁷⁸ was described as a mixed method, longitudinal, descriptive study, it was considered to be an uncontrolled before and after experimental study. None of the included studies^{18,20,78} used randomization to allocate participants to treatment groups, nor blinded participants to treatment allocation; however due to the nature of the studies it would not have been feasible to assign treatment groups randomly or blind participants to the intervention. None of the studies indicated that the allocation of treatment groups was concealed from the allocator, placing these studies at risk of selection bias. Small sample size was of concern in all of the studies. Risk of attrition bias was present in two of the studies^{20,78} as drop out of participants was high over the course of the study, in particular in Tran et al.²⁰ and Wells et al.,⁷⁸ and outcomes of people who withdrew was not fully described. Several reasons for the low response rates are explained in both Wells et al.⁷⁸ and Tran et al.,²⁰ such as length of survey, staff shortage and resistance to change. None of the included studies blinded the assessors of outcomes to the treatment allocation of the groups, placing all studies at risk of detection bias.

Two studies^{18,20} had comparable control and treatment groups; however this was not applicable as there was no control group in Wells et al.⁷⁸ The strength in all of the studies was that all groups were treated identically besides the named intervention, and outcomes were measured the same way for each group in the individual studies, although Fairbrother et al.¹⁸ did perform a further analysis on nurses' job satisfaction in the intervention wards only. The three studies used reliable tools to measure outcomes, with one study¹⁸ adapting a pre-existing tool to meet the local context needs. Appropriate statistical analysis occurred in each, although it may have been appropriate to perform a statistical power analysis to account for differences in sample sizes due to large reduction of survey responses at follow up in Wells et al.⁷⁸ and Tran et al.²⁰

Table 1 - Methodological quality of included studies

| Citation | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 |
|--|----|----|----|----|----|----|----|----|----|-----|
| Fairbrother G, Jones A, Rivas K. (2010) ¹⁸ | N | N | N | N | N | Y | Y | Y | Y | Y |
| Tran DT, Johnson M, Fernandez R, Jones S. (2010) ²⁰ | N | N | N | U | N | Y | Y | Y | Y | Y |
| Wells J, Manuel M, Cunning G. (2011) ⁷⁸ | N | N | N | N | N | NA | Y | Y | Y | Y |

3.3 Description of included studies

Three studies were included in the review; two studies were conducted in Australia^{18,20} and one was conducted in Canada.⁷⁸ See (Appendix V) for the characteristics of the included studies. This systematic review focused on two models of care, team nursing and total patient care; however the terminology used to describe the models of care varied in the studies. For example, the term shared care in nursing (SCN) was used in Tran et al.²⁰ to describe a model of care that was considered equivalent to a team nursing model as defined by this review. Table 2 outlines the models of care as described in included studies and alignment with terminology in this review.

Table 2 - Models of care as described in included studies and in alignment with terminology in review

| Study | Model of care as described in included studies | Alignment with review terminology |
|---|---|--|
| Fairbrother et al. (2010) ¹⁸ | Team nursing model of care: In this model there is a shared responsibility approach to team nursing and not a task allocation style. Some of the wards had team leaders, some had shift coordinators and others created leaderless teams. | Team nursing |
| | Individual patient allocation (IPA) model of care: In this model one nurse assumes the responsibility for the complete care of a group of patients on a one-on-one basis during that shift. | Total patient care |
| Tran et al.(2010) ²⁰ | Shared care in nursing (SCN) model: This model involves RNs ENs and AINs working in teams to deliver care. | Team nursing |
| | Patient allocation (PA) model. This model involves one RN responsible for total care of a number of patients. It does not guarantee continuity of care throughout the patient admission. | Total patient care |
| Wells et al.(2011) ⁷⁸ | Modified total patient care (TPC) involves the assigning of care to an individual nurse during the shift. | Total patient care |
| | Team nursing: This is not described. | Team nursing |

Findings of the review: Description of individual studies

Fairbrother et al. (2010)¹⁸

The Fairbrother et al.¹⁸ study compared job satisfaction, nurses' experiences and staff turnover when changing the model of care from total patient care to team nursing. Twelve medical and surgical wards/units participated with six wards/units changing from a total patient care model to a team nursing model, and six remaining with the total patient care model. The participants included registered nurses, enrolled nurses, new graduate registered nurses and clinical nurse specialists. A hospital-wide survey was distributed at baseline with a total of 221 nursing staff being surveyed; this included 42 responses from staff not included in the study as the whole hospital had been surveyed, including areas such as intensive care. The survey was repeated 12 months after implementation of the team nursing model. The outcomes of interest for this review were job satisfaction and staff turnover.

Tran et al. (2010)²⁰

The Tran et al.²⁰ study compared job satisfaction and stress of nurses working within team nursing and total patient care models. There were four intervention wards which introduced a team nursing model compared to four wards which maintained a total patient care model. The participants included registered nurses, enrolled nurses and assistants in nursing. At the commencement of the study there were 150 nurses eligible for inclusion in the study and questionnaires were distributed to these staff members, with 125 returned. There were 51 responses from the total patient care model wards and 74 from the team nursing model wards. The demographics for both groups were similar at commencement of the study, predominantly registered nurses or clinical nurse specialists. The same survey was then redistributed six months post-introduction of the team nursing model with 53 total responses; 39 from team nursing model wards and 14 for the total patient care model wards. It is important to note that Tran et al.²⁰ described their patient allocation model as one registered nurse being responsible for the total care of a number of patients without guarantee of continuity of care throughout the patient admission; therefore in terms of this review it aligned with a total patient care model. However if the nurse was responsible for the patients' entire hospital stay then it would have been considered a primary care model. Outcomes of interest for this review were job satisfaction and stress.

Wells et al. (2011)⁷⁸

Wells et al.⁷⁸ study was conducted on two acute care nursing units which previously practiced a team nursing model and changed to a total patient care model to assess how the change affected nurses' job satisfaction, empowerment and care effectiveness perceptions. The study was conducted over a 12-month period with three phases of data collection, at pre-implementation and then at three months and 12 months. The potential sample size was 118 which included 70 registered nurses, eight licensed practical nurses, and 40 casual and relief staff. Self-report surveys were distributed to these nurses. The response rate for registered nurses was 31 at pre-implementation, 28 at three months and 18 at 12 months. The licensed practical nurses' response rate at pre-implementation was eight, the three months response rate was seven, and the 12 months response rate was three. The casual and relief staff response rate was five at pre-implementation and three at three months. There were no licensed practical nurse responses from the casual and relief staff at 12 months. Data from registered nurses and licensed practical nurses was combined due to the low response rates. The outcome of interest for this study was job satisfaction.

3.4 Results: Outcome measures

3.4.1 Job satisfaction

Job satisfaction was reported in the three included studies,^{18,20,78} (Table 3) with each study using a different method to ascertain job satisfaction. All studies used a questionnaire or survey to obtain data. Fairbrother et al.¹⁸ measured job satisfaction using the Nursing Workplace Satisfaction Questionnaire (NWSQ) tool⁷⁹ which was developed by the authors in 2009 for this study as existing tools to measure satisfaction were seen as too long, and considered to be US biased.⁷⁹ The NWSQ tool identified three domains to measure job satisfaction: intrinsic, extrinsic and co-worker. Intrinsic was classified as job satisfaction within each individual nurse, extrinsic was classified as satisfaction with the work environment, and co-worker was considered as job satisfaction with fellow nurses. The scoring scale indicates that a lower score corresponds to a higher satisfaction level. Tran et al.²⁰ measured job satisfaction using the Job Descriptive Index (JDI), which includes satisfaction with work, supervision and co-workers, and the global Job in General (JIG) scale.^{80,81} Each scale consists of 18 items and nurses were required to describe each component of the JDI and global JIG. In this tool, higher scores indicate higher levels of job satisfaction. Wells et al.⁷⁸ measured job satisfaction using the Index of Work Satisfaction (IWS).⁸² This is a two part tool: part A assesses perceived importance and calculates using a weighting coefficient, and part B is a seven-point Likert scale and provides an overall mean of six job variables which include interaction, status, autonomy, tasks, policy and pay, with higher scores indicative of higher satisfaction. As a result of different tools used to measure job satisfaction, meta-analysis of results was not appropriate.

Table 3 - Job satisfaction

| Study and measure | Data | | | |
|---|---|---|---|---|
| Fairbrother et al. (2010) ¹⁸ Self-completion surveys NWSQ Tool | Mean job satisfaction scores at 12 months for team nursing and total patient care wards | | | |
| | | Team nursing wards (n=6) Mean (95% CI) | Total patient care wards (n=6) Mean (95% CI) | ANOVA F (P) differences between team nursing and total patient care wards |
| | Intrinsic | 12.4 (11.4-13.4) | 13.5 (12.5-14.5) | 1.7 (0.18) |
| | Extrinsic | 11.3 (10.7-11.9) | 12.7 (12.0-13.4) | 5.4* (0.005) |
| | Co-worker | 7.2 (6.7-7.7) | 7.5 (7.0-8.0) | 0.32 (0.73) |
| | Total | 30.9 (29.1-32.7) | 33.5 (31.7-35.3) | 2.6 (0.077) |

| Study and measure | Data | | | | | | | | |
|--|--|--------------------------------|--------------------------------|--------------------|---------------------|--------------------|---------------------|----------------|-----------------|
| Fairbrother et al. (2010) ¹⁸ Self-completion surveys NWSQ Tool | Mean job satisfaction scores by nursing staff classification on team nursing wards at baseline and 12 months | | | | | | | | |
| | | Baseline staff number response | 12 month staff number response | Intrinsic Baseline | Intrinsic 12 months | Extrinsic baseline | Extrinsic 12 months | Total baseline | Total 12 months |
| | Enrolled Nurses | 15 | 16 | 9.9 | 10.4 | 9.8 | 10.3 | 26.2 | 27.6 |
| | Graduate Nurses | 7 | 7 | 14.6 | 10.3** | 12.6 | 9.8** | 34.6 | 28.3 |
| | Registered Nurses | 54 | 51 | 14.2 | 13.2 | 13.0 | 11.8* | 34.9 | 32.0** |
| | Clinical Nurse Specialist | 17 | 17 | 12.2 | 12.2 | 12.7 | 11.7 | 32.4 | 31.3 |
| *(p less than 0.05) –Statistically significant ** (p 0.05 and 0.20) –Notable difference | | | | | | | | | |

| Study and measure | Data | | | | | | |
|---|--|-------------------------------|--|-------------------------------------|--|--|---------------------------|
| Tran et al. (2010) ²⁰ Self-administered survey at baseline and then repeated at follow-up (6 months) Job descriptive Index and Job in General scale Tool | Mean job satisfaction scores on team nursing and total patient care wards at baseline and 6 months | | | | | | |
| | | Within Group Mean (SD) | | | | Between Group Mean difference (follow-up-baseline) | |
| | | Team nursing –baseline (n=74) | Team nursing follow-up 6 months (n=39) | Total patient care –baseline (n=51) | Total patient care follow-up 6 months (n=14) | Team nursing (n=25) | Total patient care (n=13) |
| | Work (ROS 0-54) | 41.28 (7.85) | 42.33 (9.56) | 39.73 (10.65) | 41.29 (14.11) | 0.34 (12.56) | 3.38 (10.23) |
| | Supervision (ROS 0-54) | 42.58 (10.13) | 41.55 (13) | 39.4 (10.99) | 36.23 (13.54) | -2.88 (16.26) | 0.50 (2.15) |
| | Co-worker (ROS 0-54) | 41.78 (10.17) | 37.44* (11.8) | 41.15 (10.89) | 40.57 (13.21) | -0.75 (15.67) | 1.92 (9.88) |
| | Global (ROS 0-54) | 41.29 (8.84) | 40.6 (10.61) | 41.87 (11.65) | 43.64 (7.97) | -1.60 (15.33) | 0.67 (7.84) |
| *(p less than 0.05) –Statistically significant (ROS):Range of scores for job satisfaction | | | | | | | |

| Study and measure | Data | | | | | |
|--|---|-------------------------------------|-------------|--------------------------------|-------------|---------------------------------|
| Wells et al. (2011) ⁷⁸ Self-completed surveys Index of work satisfaction Tool | Ranking of most important job variables | | | | | |
| | Variable | Pre-implement weighting coefficient | Variable | 3 months weighting coefficient | Variable | 12 months weighting coefficient |
| | Pay | 3.44 | Pay | 3.64 | Pay | 3.73 |
| | Tasks | 3.32 | Autonomy | 3.35 | Autonomy | 3.16 |
| | Autonomy | 3.22 | Interaction | 3.30 | Interaction | 2.94 |
| | Status | 3.10 | Tasks | 3.19 | Status | 2.84 |
| | Interaction | 3.03 | Status | 3.17 | Tasks | 2.77 |
| Policy | 2.29 | Policy | 1.96 | Policy | 2.31 | |

| Ranking of satisfaction with variables | | | | | |
|---|----------|------------------------------------|--------------|------------------------------------|---------------|
| Variable | Pre-mean | Variable | 3 month mean | Variable | 12 month mean |
| Status | 5.00 | Status | 5.06 | Status | 5.08 |
| Interaction | 4.53 | Interaction | 4.44 | Interaction | 4.43 |
| Autonomy | 4.18 | Autonomy | 4.05 | Autonomy | 4.29 |
| Tasks | 2.81 | Pay * | 2.79 | Tasks | 2.58 |
| Policy | 2.38 | Tasks | 2.72 | Policy | 2.24 |
| Pay | 2.23 | Policy | 2.18 | Pay | 2.23 |
| Overall Index of work satisfaction | 3.64 | Overall Index of work satisfaction | 3.66 | Overall Index of work satisfaction | 3.64 |
| *(p less than 0.05) – Statistically significant | | | | | |

There was no statistically significant difference observed in any study in the overall job satisfaction of nurses using a team nursing model compared with a total patient care model.^{18,20,78} Some differences in job satisfaction were however observed within different subgroups of nurses and within various domains of job satisfaction utilized by the studies. In assessing job satisfaction in all nurses according to domains of intrinsic, extrinsic and coworker, Fairbrother et al.¹⁸ showed that there was a lower score for extrinsic job satisfaction which demonstrated a statistically significantly higher extrinsic job satisfaction in the team nursing model wards (mean 11.3; 95% CI 10.7-11.9) compared with total patient care model wards (mean 12.7; 95% CI 12.0-13.4) at 12 months; this was a significant difference of 5.4 ($p = 0.005$) between the two groups using the Analysis of Variance ANOVA F (P) test. There were no statistically significant changes in intrinsic job satisfaction on team nursing model wards (mean 12.4; 95% CI 11.4-13.4) and total patient care model wards (mean 13.5; 95% CI 12.5-14.5). There was no statistically significant difference with satisfaction with co-workers on the team nursing model wards (mean 7.2; 95% CI 6.7-7.7) compared to total patient care model wards (mean 7.5; 95% CI 7.0-8.0).

In assessing results according to nurse classification, Fairbrother et al.¹⁸ identified the team nursing model as favorable for new graduates compared to the previous model of total patient care, as job satisfaction in all domains improved for graduate nurses working on wards using the team nursing model; however these results were not statistically significant. There were notable increases in intrinsic job satisfaction (baseline mean score 14.6, 12 months mean score 10.3; p between 0.05 and 0.20) and extrinsic job satisfaction (baseline mean score 12.6, 12 month score 9.8; p between 0.05 and 0.20); however with limited participants in this classification group ($n=7$), a statistically significant difference was not expected. There was a statistically significant difference in the registered nurses' extrinsic job satisfaction (baseline mean score 13.0, 12 months mean score 11.8; p less than 0.05). Total satisfaction for this group had also improved with a notable difference (baseline mean score 34.9, 12 months mean score 32; p between 0.05 and 0.20). Enrolled nurses had an overall higher job satisfaction than any other classification at baseline and follow-up at 12 months; however total job satisfaction did decrease with the introduction of a

team nursing model (baseline mean score 26.2, 12 months mean score 27.6). Total job satisfaction scores increased for nurses of all other classifications.

Tran et al.²⁰ demonstrated that nurses experienced high levels of job satisfaction regardless of the model of care, with scores of 75% or more of maximum scores of job satisfaction achieved using both models. There was a decrease in staff satisfaction with co-workers following introduction of a team nursing model, with a statistically significant (p less than 0.05) decrease between baseline (mean 41.78; SD 10.17) and follow-up at six months (mean 37.44; SD 11.8). The authors noted that job satisfaction was influenced by tension, increasing levels of stress and uncertainty in role.

There were no significant changes in nurses' job satisfaction following a change from a team nursing model to a total patient care model in Wells et al.,⁷⁸ however the authors suggest variables other than the model of care were shown to influence job satisfaction. Nurses consistently ranked pay as the most important job variable and policy as the least in the index of work satisfaction tool. The only significant difference with job satisfaction ranking with the variables was nurses' job satisfaction with their pay at three months, with a mean of 2.79 ($p < 0.05$), as compared with a mean of 2.23 at pre-implementation and 2.23 at 12 months. The positive change at three months was likely due to nurses receiving retroactive pay at this time. At 12 months, pay was once again the variable with which nurses were least satisfied. Nurses perceived interaction as having greater importance following the introduction of a total patient care model as this had ranked as fifth most important job variable at baseline, but this then went to third out of the six criteria at the three and 12 months review. This may have been a result of a decrease in interaction with other nurses due to the move from a team nursing model to a total patient care model, and nurses recognized that there was a loss of interacting with other nurses in the total patient care model which then increased their ranking of this variable.

3.4.2 Stress

Stress was reported in one of the included studies (Tran et al.)²⁰ (Table 4), which measured stress using the Stress in General (SIG) Scale.⁸³ The SIG scale has 15 items with two subscales, pressure at work and work-related threat. Job tension was also included and was measured using the Tension Index developed by Lyons.⁸⁴ In this tool the higher the score the higher the level of tension as measured by the frequency of feeling bothered by various work factors. As shown in Table 4 there were no statistically significant differences in either stress or job tension between wards using the team nursing model or the total patient care model.

Table 4 – Stress

| Study and measure | Data |
|----------------------------------|--|
| Tran et al. (2010) ²⁰ | Mean stress and job tension scores on team nursing and total patient care wards at baseline and six months |

| Self - administered survey at baseline and then repeated at follow-up (6 months) | Within Group Mean (SD) | | | | Between Group Mean difference (follow-up-baseline) | |
|--|------------------------------|--|------------------------------------|--|--|---------------------------|
| | Team nursing baseline (n=74) | Team nursing follow-up 6 months (n=39) | Total patient care baseline (n=51) | Total patient care follow-up 6 months (n=14) | Team nursing (n=25) | Total Patient care (n=13) |
| Job descriptive Index and Job in General scale Tool | | | | | | |
| Pressure (ROS 0-14) | 12.38 (3.96) | 12.55 (3.43) | 11.98 (4.18) | 11.62 (4.46) | 0.08 (4.13) | -0.58 (3.09) |
| Threat (ROS 0-16) | 8.51 (5.61) | 8.78 (4.77) | 7.87 (5.84) | 8.00 (5.94) | 1.00 (6.27) | -0.92 (4.89) |
| Tension (ROS 9-45) | 23.27 (6.1) | 23.11 (5.5) | 23.06 (6.1) | 25.74 (6.9) | -0.46 (7.67) | -0.97 (2.94) |
| Range of scores (ROS) for pressure, threat and tension | | | | | | |

3.4.3 Burnout

No identified studies addressed burnout when comparing a team nursing model with a total patient care model.

3.4.4 Absenteeism

No identified studies addressed absenteeism when comparing team nursing model with a total patient care model.

3.4.5 Staff turnover

Staff turnover was reported in one of the included studies, Fairbrother et al.¹⁸ measured staff turnover by dividing the vacancy rate with the number of full time equivalent (FTE) nursing staff. Table 5 presents the combined ward vacancy rates at baseline and 12 months follow-up for the team nursing model wards and total patient care model wards and includes the improvement in vacancy rates by percentage.

There was a decrease in vacancy rates in both the team nursing model and total patient care model groups from baseline to follow-up at 12 months. The vacancy rate improved by 75% in team nursing model wards and by 41% in total patient care model wards, suggesting that while there was a reduction in vacancy rates in both groups, staff turnover may be reduced with a team nursing model compared with a total patient care model; however these results were not statistically significant. The data was subjected to a Mann-Whitney test $U = 10$; $P = 0.20$ and it did not show a statistically significant result. Therefore it cannot be determined whether a team nursing model or a total patient care model directly affected turnover; however the team nursing model wards improved vacancy rates faster than the total patient care model wards.

Table 5 - Staff turnover

| Study and measure | Data | | | | | |
|--|--|---------------|----------------------------|-----------------------|------------------------------------|---|
| Fairbrother et al. (2010) ¹⁸ | Total Full Time Equivalent (FTE) vacancies on team nursing and total patient care wards at baseline and 12 months. | | | | | |
| Number of FTE vacancies divided by FTE's allocated | | Baseline FTEs | Follow-up (12 months) FTEs | Baseline vacancy rate | Follow-up (12 months) vacancy rate | Per cent (%) Improvement (vacancy rate) |
| | Team nursing total | 54.1 | 12.7 | 0.32 | 0.08 | 75 |
| | Total patient care total | 31.8 | 15.7 | 0.23 | 0.13 | 41 |
| Non-parametric statistical testing(Mann-Whitney U =10.0; P=0.20) | | | | | | |

This chapter constitutes the discussion, conclusions, implications for practice and further research in the area of nursing models and their effect on staff wellbeing when organizing nursing work in acute care wards.

4.1 Discussion

4.1.1 Nursing Models and Staff Wellbeing

This thesis is based on the systematic review that sought to establish, through the best available evidence, the effectiveness of a team nursing model compared with a total patient care model on staff wellbeing when organizing nursing work in acute care wards. Staff wellbeing was measured by staff outcomes in relation to staff satisfaction, turnover, absenteeism, stress levels and burnout. Due to the limited number of quantitative studies that could be included, the review could not conclude whether a team nursing model or a total patient care model is the preferred model when addressing these outcomes. Several studies^{32,85-91} investigating models of care were excluded from the review for a variety of reasons, including using hybrid models of care, ambiguity around the model of care used, using multiple models of care, or reporting on patient rather than nurse wellbeing outcomes. The findings of these studies, however, can contribute to the discussion regarding which is the best model of care and will be discussed below. The review demonstrated that there needs to be consistency in terminology to describe the various models of care. There is also a requirement for agreed methodologies and tools to measure aspects of staff wellbeing to enable reliable data extraction and synthesis.

The review did not consider qualitative data, however all of the included studies^{18,20,78} had a qualitative component and reported themes regarding aspects of either team nursing or total patient care models that nurses experienced as either positive or negative. In the Fairbrother et al.¹⁸ study, the positive aspects of changing to a team nursing model from a total patient care model identified by nurses included greater support for inexperienced staff, role clarity, greater communication and teamwork. The negative themes included senior nurses preferring the total patient care model as they felt this was more personally satisfying, and senior enrolled nurses feeling a loss of autonomy within the team nursing model.¹⁸ In Tran et al.²⁰, team leaders perceived the benefits of a team nursing model as increased confidence in communicating with nursing staff and medical staff, increased time management and prioritizing skills, improved relationships with team members, patients and medical staff, the opportunity to support new team members and the ability to focus on patients' needs. The detrimental aspects of the team leader role as perceived by some of the registered nurses surveyed included increased workload, responsibility and stress.²⁰ Wells et al.⁷⁸ reported positive responses from nurses who were using the total patient care

model including enhanced professional practice, clear accountability and increased coordination of care. The challenging aspects identified included communication issues, lack of ongoing support, care plan issues and missed care. Other research⁹² has described benefits of a team nursing model perceived by nurses as allowing for a patient-orientated approach as all the nurses were familiar with the patient care needs, increased supervision and enhanced quality of patient care. Collectively, these results suggest that staff were more concerned with specific aspects of models of care, such as role clarity, communication, teamwork, supervision, patient care needs and support for staff, rather than the model of care per se. Other factors such as leadership, teamwork, role ambiguity, scope of practice, experience and skill mix were therefore likely to influence staff wellbeing rather than solely the nursing model.

The included studies^{18,20,78} demonstrate that whilst there were some significant differences between a team nursing model and a total patient care model in certain subgroups of nurses or within various domains of job satisfaction, the model of care did not have a significant effect on the total job satisfaction of nurses. This is supported by Adams and Bond^{32,86} who concluded that staff resources, stability in the workforce and ethos of care had greater influence on nurses' job satisfaction than the organizational system in place. This was also the case in Kangas et al.⁹³ who compared team nursing, primary and case management nursing models. This study concluded that there was no difference in nurses' job satisfaction between the nursing care delivery models and that a supportive environment was the main component of nurse satisfaction.

The systematic review also demonstrated that job satisfaction is influenced by multiple factors related to nursing and not necessarily the model of care in place, although factors such as nursing experience, ward size, ward stability and skill level can impact on job satisfaction and should be considered when establishing which model of care to implement. Where staff are new and inexperienced, a team nursing model may be the appropriate model. Fairbrother et al.¹⁸ identified that novice nurses, in particular new graduate nurses, had greater job satisfaction with a team nursing model. Tran et al.²⁰ also suggested a team nursing model may be appropriate if there is a mix of nursing staff with varying experience and skill. The team nursing model is documented in the literature as a model which supports novice nurses when there is a lower registered nurse skill mix.³¹ In one study, Sjetne et al.⁸⁸ looked at primary nursing, team nursing and a hybrid model of the two to assess the relationship of these models with job satisfaction. Job satisfaction was influenced by the size of the ward and was lower in larger wards. Job satisfaction in all wards was positive if shifts were staffed to rotation plan. Agency utilization also contributed to a negative association of job satisfaction, which was also the case in another study.⁸⁶ These studies indicate that where there is a higher experienced registered nurse skill mix, then a total patient care model may be appropriate, but where there is a higher skill mix of inexperienced registered nurses, enrolled nurses or assistants in nursing, then a team nursing model should be considered to support and guide these nurses.

Nurses' job satisfaction will differ for each nurse regardless of the nursing model of care in place but as the review identified there are similarities in factors that contribute to job satisfaction, including leadership, supervision, quality of care, working conditions, relationships with co-workers and pay. The need for effective leadership and support when changing the model of care was also a recommendation in Wells et al.⁷⁸ A literature review by Lu et al.⁴³ on job satisfaction among nurses identified that although job satisfaction levels differed for individual nurses there are common sources of job satisfaction, such as "physical working conditions, relationships with fellow workers and managers, pay, promotion, job security, responsibility, the recognition from managers and hours of work."^{43(p215)} Nurses view leadership and supervision as important factors in their levels of job satisfaction, this was highlighted in McGillis Hall and Doran,⁸⁷ who concluded that there were positive associations between job satisfaction and views of leadership. The need for effective leadership, supervision and accountability is crucial to ensure effective ward environments,^{23,78,94,95} and these factors may influence nurses job satisfaction more so than the model of care in place.

The other outcomes of interest in the review may also be influenced by factors other than the nursing model of care. As discussed in McGillis Hall and Doran⁸⁷, factors such as quality of care, nurses' perceptions of leadership and patient complexity can influence nurses' stress levels. This study demonstrated that a total patient care model had a statistically significant negative influence on nurses' job pressure and therefore concluded that models which do not use a total patient care model may contribute to nurses' job pressure. It is also important to note that this study was conducted on wards where the majority (83.1%) used a total patient care model. When looking at absenteeism, Kivimaki et al.⁸⁹ compared primary nursing with team nursing over three years, and showed that the model of care did influence sickness absence and that a primary nursing model was associated with higher sickness absence than a team nursing model. Nursing organizational models were not identified as a predictor of absenteeism in a systematic review by Davey et al.⁴⁸ which investigated predictors of nurse absenteeism and revealed that predictors of absenteeism included nurse's absenteeism history, nurses' job satisfaction, job involvement, organizational commitment, staff retention, stress and burnout.

The review was unable to determine if a team nursing model or a total patient care model affected staff turnover, as turnover was seen to improve under both models in the one study that reported this outcome.¹⁸ A recent literature review⁵¹ discusses numerous influences which affect turnover such as workload, work environment, organizational structure, stress, burnout, management style, empowerment, role perceptions, career advancement, pay and individual factors. They also highlight that job satisfaction is a greater predictor of intent to leave than age, working shifts and promotion. Overall, nurses who are satisfied in their job are more likely to remain in their current roles.⁹⁶

As already identified in the results section there was no statistically significant difference in overall job

satisfaction, stress, job turnover or staff turnover between the stated models of care. In regards to absenteeism and burnout none of the identified studies addressed these outcomes in terms of the two models of care indicating a gap in current research. It is known that these factors have significant implications for workplaces in regards to costs associated with replacement of staff to cover the absenteeism or providing staff counselling services. There are also implications associated with an employee's absence from the workplace such as a loss of knowledge and skill which potentially compromises patient care due to loss of expertise. Colleagues may be impacted due to increase in workload as the absenteeism may not be replaced or is replaced with an inexperienced nurse. The employee is also impacted through their overall sense of wellbeing and potential loss of income. However what this review did show was that leadership, skill mix, defined nursing roles and staff retention each have a greater influence on nurses' wellbeing than the model of care being used. Findings from this review may assist policy makers, nursing leaders and hospital executives in making an evidence-based decision on which model of care to implement to achieve the best outcomes for nurse's wellbeing.

King et al. (2015), published an editorial in the JBI Database of Systematic Reviews and Implementation Reports ⁹⁷ (Appendix VIII) which discussed factors other than nursing models, which may influence nurses' wellbeing and this included scope of practice, skill mix, patient care requirements, restructuring of services and leadership. It is important that team members have a clear understanding of their scope of practice to ensure role clarity, as highlighted in the Tran et al.²⁰ study which used the role conflict and ambiguity scales developed by Rizzo et al.⁹⁸ This study revealed that the higher the role ambiguity and the lower the role clarity, the higher the levels of role conflict. There are also increasing advanced registered nurse practitioner roles and extended enrolled nurse roles which increase these qualified nurses' scope of practice and which can create confusion. In Australia, it is reported that there is a lack of insight into the roles of enrolled nurses and assistants in nursing, creating conflicts in regards to scope of practice, which can lead to bullying and miscommunication regarding workloads and responsibilities. Ultimately this can affect the quality of nursing care.³³ Nurses need to be aware of their own scope of practice and that of their colleagues, and this is the case for all models of care.

Job satisfaction, stress, burnout, absenteeism and nursing turnover all have financial implications for nursing staff, patients and organizations due to costs associated with employing and training new staff, replacing absent staff, costs of work cover associated with leave, and management of burnout and stress-related illness. The loss of experienced nurses can negatively impact not only the team but also patient care and outcome.

4.1.2 Nursing Models and Patient Care

Patient outcomes are not the focus of this review; however various studies have focused on the effects of

the model of care, registered nurse staffing, increased nursing hours and patient turnover on patient outcomes.^{37,99-104} One of the included studies⁷⁸ identified a total patient care model as providing greater client care than a team nursing model on the client care effectiveness scale. The number of patients which a nurse cares for can affect their job satisfaction. As Hairr et al.⁹⁶ discussed, if nurses have a reduced number of patients to care for, they will have greater job satisfaction which will equate to better patient outcomes.

The cost of the nursing and patient care requirements increasingly define which model of care is chosen. Patient acuity needs to be considered when reviewing staffing requirements and balance the increasing focus by management on staff costs. For example increased nursing hours per day have been linked to decreased sepsis, shock and rates of pneumonia¹⁰² and can be attributed to better patient outcomes.¹⁰⁴ The number of patients that nurses care for is also a significant factor and can cause an increase in patient mortality, failure to rescue, decrease in quality of care and a decline in patient safety if there is a decrease in nursing staff numbers to care for patients.¹⁰³ The clinical implications that the different nursing models have on patient outcomes have been addressed in the literature.³⁷ As highlighted above the model of care can impact on patient outcomes, however patients are usually unaware as to what model of care is being used to organize the nursing work.¹⁰⁵

The community and patients are now more aware and more involved in healthcare decisions, and continue to expect more from the health care system. Consumers want to be involved in decision making, they are aware of the issues in healthcare that affect them and will drive and insist on reform.¹⁰⁶ Therefore from a nursing perspective we need to ensure that the model of care meets the consumer's needs, to ensure that they are fully informed and involved in their care, but also ensures the wellbeing of nurses.

4.1.3 Terminology and Methodological Tools

The review identified that quantitative studies need to have clear terminology to enable differentiation between the various nursing models to ensure comparability between studies. This has previously been identified as issues impacting on models of care research.^{19,31} This was a significant challenge in conducting the review, not only were there inconsistencies in the definitions there were also combined models which were ill-defined, making it difficult to compare outcomes. The issue with terminology regarding nursing models was highlighted in a study by Minnick et al. 2007, which reviewed 40 random US hospitals and found that none of the traditional models of care were implemented on the units to a point where they could be specifically identified.¹⁰⁷

The review demonstrated that there needs to be consistency in study designs and tools used to measure aspects of staff wellbeing to enable reliable data extraction and synthesis. Difficulties with measurement

tools was also identified in a systematic review on absenteeism which identified a “major inconsistency across research on nursing absenteeism is around the measurement of this behavior.”^{47(p.107)} The authors describe that in some studies researchers relied on estimates, while in others researchers used actual absenteeism.⁴⁷

The differences in the terminology, which describes nursing models and inconsistencies with the measurement tools used to measure staff wellbeing has created difficulties in effectively comparing studies. Nursing as a profession needs to establish consistent, agreed upon terminology for the nursing models that organize nursing work. There is also a requirement to develop study methodologies which use reliable tools to measure staff wellbeing. This will enable comparison of studies in the future to inform future nursing practice on the most effective nursing care delivery model which supports staff wellbeing.

4.1.4 Restructuring and ward design

The term model of care is used extensively and can be broadly defined as the way in which healthcare services are delivered.¹⁰⁸ Nursing models of care in an acute care setting have been described earlier in this thesis as the delivery of care through the organization of work inclusive of how nurses communicate with each other, and other health professionals, and how the work is coordinated and delivered.⁴ The way care is delivered and organized can be dependent on the hospital environment and structure. Models of care delivery need to be reviewed when hospitals are restructured, as a result of new constructions, major redevelopments, realignment of services and organizational structures. The design of new hospitals and redevelopments are often radically different from previous or existing hospital designs. This may have significant implications for the way in which clinical care is delivered. The current trends in Australia and internationally for new hospital constructions is a single patient room approach, as opposed to multiple beds in an area.^{109 110}

Potential advantages of a single room model include increased patient privacy, enhanced sleep for patients, increased patient satisfaction, reduced infection rates and fewer interruptions for staff.¹¹⁰ Potential disadvantages include decreased patient visibility, increase in falls, patients feeling isolated and increased distances for staff to cover thus reducing direct patient care.¹¹⁰ The impacts on staff outcomes include increased staffing level requirements, increase in RN skill mix, increase in staff stress and increased risks to personal safety. Currently there is scarce available evidence on the associated costs, in relation to patient and staff outcomes of single room accommodation models.^{109,110}

Realignment of services is a way in which organizations attempt to be cost effective,²⁷ and improve healthcare outcomes by reducing inefficiencies. Regardless of the rationale for changes to services, models of care need to be reviewed when reconfiguration, realignment and amalgamation of health care

delivery services occurs. In the 1990's, 57% of United States hospital executives reported that their organizations had undergone restructuring, resulting in a reduction of staff in 90% of these hospitals and a reduction in nursing skill-mix in 70% of the restructured hospitals.²⁷ These reductions have a large impact on the nursing workforce and nurses have adapted to these challenges through increasing scope of nurses' practice, implementing professional practice models and changing care delivery models.

4.1.5 Cost effective care

Tiedeman and Lookinland 2004, describe that there are varying views regarding costs of nursing models.¹⁹ In one study the team nursing model was seen as an expensive model as there are more nurses required to deliver the care, and was also less efficient as coordinating and delegating was seen to reduce productive work time.¹⁹ This is contradictory to other studies which found that a total patient care model and a primary nursing model were more expensive and other studies that demonstrated there is no difference in the cost.¹⁹ There is a need for further studies on models of care which include an economic evaluation to determine the most cost effective model, with a focus on nursing outcomes in terms of nurses' wellbeing.

Nurses are the largest professional group in hospitals and therefore account for a large component of a hospital's workforce expenditure.¹¹¹ As mentioned previously the nursing workforce is influenced by many factors such as budgetary constraints, recruitment and retention of staff, workforce demographics such as an ageing workforce and ever changing technologies and treatment advances. It is predicted that there will be a shortage in nurses of up to 27%, or 109,000 nurses, in Australia if changes to education and efficiencies in health care sector are not made.¹¹² Nursing leaders and organizations need to ensure that the current and future nursing workforce is equipped and adapted to meet these needs and that of the community's expectations to receive safe and effective care.

4.1.6 Professional practice models and Magnet®

This thesis has focused on nursing care delivery models rather than professional practice models, however it is necessary to briefly discuss the concepts of professional practice models. Nursing care delivery models are a system to manage and organize how nursing care is delivered, whereas professional practice models set expectations for professional behaviors and clinical leadership, allow for mutual goal setting and make patient care the priority for the multidisciplinary team.¹⁴ In addition they provide clear direction to nursing practice which enables autonomous decision making and empowerment of nurses'.¹⁵ Professional practice models have also enabled improved multidisciplinary communication, consistent nursing care and improved patient outcomes.^{113,114} Professional practice models and frameworks are continuing to evolve as the science of nursing builds its knowledge base.¹⁴ A practice

model 'reflects nursing values and the culture of an organization. The dominant attributes shared among models and featured in Magnet® organizations include nursing autonomy; empowerment; and cost-effective, quality care.'¹⁴ (p.16)

The concept of Magnet® organizations, developed in the United States of America in the 1980's these organizations demonstrated an ability to attract and retain nurses, which later formed the successful characteristics for Magnet® recognition.¹¹⁵ Magnet® recognition requires health care organizations to apply to the American Nurses Credentialing Center (ANCC). Organizational nursing leaders need to adopt a professional practice model with shared governance to provide the necessary evidence of the required outcomes needed for Magnet® designation.^{116,117} As of March 2016 there were 433 Magnet®-designated organizations, with three in Australia.¹¹⁸ There are fourteen forces of magnetism, which are organized into five components which consist of "transformational leadership, structural empowerment, exemplary professional practice, (new knowledge, innovation and improvement), empirical quality results."¹¹⁶(p.136) Leadership is fundamental to the success of professional practice models as they are able to communicate the vision, values and ensure accountability of team members.

4.1.7 Nursing leadership

Leadership is fundamental in all professional fields. In nursing there are various forms of nursing leaders and they are situated throughout the healthcare system and influence healthcare policy.¹¹⁹ This discussion however will focus on nursing leaders in the acute care sector, in particular clinical leadership, and will briefly discuss executive leadership. Clinical nurse leadership for the purpose of this thesis is leadership at the direct patient care level.¹²⁰ It is also important to note that there are informal nursing leaders for example, team leaders who often have a great influence on the ward and often lead the team when formal leaders are not present.^{119,121} To implement or change the model of care these informal leaders perform a significant role in influencing and ensuring the success of the change, and it is imperative for a clinical leader to identify who these staff are. Nursing executive leaders provide organizational direction and they influence the workforce, scope of nursing practice and the patient experience at a strategic level.¹²² Nursing's executive leaders also provide professional leadership to nursing leaders and nurses, are involved with resource management (both workforce and financial) and set the standard for care and provide governance. This role includes engaging with internal and external stakeholders such as patients, caregivers, government officials and educational institutions and these connections can assist in identifying and implementing models of care.¹¹⁹

Clinical nurse leadership has been described by Stanley 2006 as "a clinician who is an expert in their field, and who, because they are approachable, effective communicators and empowered, are able to act as a

role model, motivating others by matching their values and beliefs about nursing and care to their practice.”¹²³ (p.111) It is important that clinical nurse leaders possess these qualities as they need to be able to communicate with patients, families, nursing staff, the multidisciplinary team and management. They need to be good clinicians to ensure that they can recognise gaps in patient care and any identify system issues or risk concerns.¹¹⁹ The ability to role model best practice is a necessity to this role, as is the need to promote a positive work environment. Creating a positive work environment however is a shared responsibility across the organization and involves all staff.¹¹⁹

Clinical nursing leaders need to influence the work environment by managing staff and ensuring staff are equipped with the appropriate skills and knowledge to provide quality patient care. There may be a requirement for a clinical nurse leader to change the model of care due to workforce issues, restructuring, financial implications or changes to the professional practice model. Wolf and Greenhouse 2007 discuss, when developing a care delivery model for the future it is not necessary to start from the beginning; we can learn from the past and from scientific evidence, and include these into our planning.¹⁰⁶ To change the model of care requires strong leadership and management support.¹²⁴

Hayman et al. 2006 discuss in their study that there was negativity in changing the model of care pre- and post-implementation and that this was largely due to a lack of involvement and communication from managers with the change process.¹²⁵ Nursing staff engagement is pivotal in successfully changing the model of care. This is further supported by Cornelissen 2008 who describes that when employees are involved in decision-making and are able to exert some control over their working life then they connect better with the organization and are more committed.¹²⁶

Patient clinical indicators, patient safety and quality improvement initiatives need to be at the forefront of nursing leader’s decision making when determining the appropriate care model. Clinical nursing leaders are required to monitor and manage workforce issues such as absenteeism, turnover, stress, work cover and staff performance. In summary, nursing clinical leaders need to communicate with a wide variety of stakeholders, manage budgets in a fiscally responsible manner, be abreast of clinical advancements in healthcare and provide clear leadership.

4.2 Limitations of the review

Challenges faced in conducting the systematic review included a lack of consistency with terminology and a lack of consistent interpretation of the various nursing models in the literature. This may have resulted in relevant studies not being identified in the search or being excluded from the review. The review only identified three studies which met the inclusion criteria, and there was inconsistency in the study designs and each was limited by small and differing sample sizes. One study¹⁸ had 221 participants, the second study²⁰ had 125 participants and the final study,⁷⁸ 78 participants. In addition there was attrition of participants and a lack of randomization. No studies were found that addressed the outcomes of staff

burnout and absenteeism. Only studies published in English were sought, and this may have excluded potentially relevant studies published in other languages. Results of the review may be affected by the fact that only studies published in English were included in the review and two were conducted in Australia.^{18,20}

4.3 Conclusion

Due to the limited number of quantitative studies identified for inclusion in the systematic review, whether a team nursing model is more effective than a total patient care model on staff wellbeing when organizing nursing work in acute care settings could not be determined. It can be concluded from the results of the review that a team nursing model may be a beneficial model to support novice, inexperienced nursing staff. In addition the team nursing model is appropriate when there is a lower registered nurse skill mix; however there needs to be clarity in roles and responsibilities for each team member to ensure satisfaction with co-workers. Nursing turnover may be reduced in team nursing model wards compared with total patient care model wards although this result was not statistically significant. Team nursing model and total patient care models do not significantly influence nurse job satisfaction, stress levels or staff turnover. It was not possible to ascertain if models of care affect absenteeism or burnout due to there being no identified studies that addressed these outcomes.

In summary, future research should focus on staff wellbeing and whilst models of care should be included in the discussion it is more likely from the evidence obtained in the systematic review and this thesis that leadership, skill mix, patient acuity, nurse to patient ratios, experience level, organizational culture and governance have a greater impact on nurse's wellbeing. There is a need for the national and international nursing profession to reach agreement on a range of definitions and measurement for nursing performance and wellbeing that will empower the profession to ensure that it is positioned to determine safe staffing levels, effective models of care and practice changes and respond appropriately to budgetary measures imposed on the system.

4.4 Implications for practice

Based on the evidence reviewed, it is recommended that the following be considered by managers and organizations when considering either a team nursing model or a total patient care model to organize nursing work (JBI Grades of recommendations used – Appendix IX):

- Caution should be taken when evaluating which model of care is appropriate and the decision needs to include staff experience level and staff skill mix. (Grade B)
- A team nursing model may be the most appropriate nursing care model to support novice nurses, in particular, new graduate nurses. (Grade B)
- There needs to be clearly defined nursing roles to decrease role ambiguity when working in a

team nursing model to ensure job satisfaction with co-workers. (Grade B)

- Nursing leadership is fundamental to the successful execution of nursing care delivery models. (Grade B)

4.5 Implications for research

The systematic review demonstrated that there is limited quantitative research in this topic area.

- To allow for future comparison and research to occur at a national and international level, there needs to be consistent agreed upon terminology for describing the models of care and consistent tools as measures. There needs to be detailed descriptions of how each model is defined, including hybrid models.
- There needs to be further randomized and pseudo-randomized controlled studies conducted to explore models of care and the impact each model has on nurses' wellbeing, in particular, studies addressing burnout and absenteeism.
- Small sample sizes, different study designs and poor response rates to surveys resulted in an inability to ascertain the most effective model of care based on the evidence presented in the studies due to limited statistical analysis. Future research should seek to include larger sample sizes and to mitigate attrition.
- It would be beneficial for future studies on models of care to include an economic analysis to fully inform policy and practice.

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Review title

Effectiveness of team nursing compared with total patient care on staff wellbeing when organizing nursing work in acute care ward settings: a systematic review protocol

Reviewers

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Review question/objective

The objective of this systematic review is to critically appraise and synthesise the best available evidence on the effectiveness of team nursing compared to total patient care on staff wellbeing when organizing nursing work in acute care ward settings. This review will seek to answer the following question:

1. Is a team nursing or a total patient care approach the most effective model of care when organizing nursing work to achieve desired staff wellbeing (defined by outcomes of staff satisfaction, stress, burnout, absenteeism and turnover) in a general ward setting?

Background

The organization of work for nurses according to recognised models of care can have significant impacts on the wellbeing and performance of nurses and nursing teams. Model of Care as described by Fowler, Hardy and Howarth 2006, will be the definition utilized for this review, and they define model of care as the:

Provision of care in an organisational setting, specifically at a clinical services unit level (ward)...Presents the structural and contextual dimensions of nursing practice...Governs the manner in which nurses organise work groups, communicate with work group members and with other disciplines, interact, make decisions, and create an environment within which nursing care is delivered among care providers, and specify communication and coordination patterns necessary to support care.¹ (pp. 40-41)

There are four predominant traditional nursing care models described in the literature to organize nursing

work: team nursing, total patient care (also known as patient allocation), task method, and primary nursing.² In recent years there has been the emergence of other models as well as various combinations of different models. In Australia, individual total patient care is the main model utilized in acute care hospitals.³ Team nursing is also a prominent care delivery model used in general ward settings whereas task allocation and primary nursing is not as commonly utilized. The model of nursing selected is dependent on nursing resources and patient care requirements. Tiedeman and Lookinland, 2004 state that models “differ in clinical decision making, work allocation, communication, and management, with differing social and economic forces driving the choice of model.”⁴ (p 291)

As team nursing and total patient care are the two most common models utilized in Australia,⁵ these are the two models of interest to this review. The team nursing model of care is where a group of nurses work as a team to deliver the care. This model utilises the diversity of skill, education and qualification level of each team member. The team works collaboratively with shared responsibility.³ This model usually relies on a team leader who is a registered nurse. It is important that the team leader has effective communication and leadership skills.⁶ The total patient care model is where one nurse is allocated a group of patients for that shift; however continuity of care is not followed through from admission to discharge as the patients are allocated on a shift-by-shift basis.^{2,3} Registered Nurses (RN) or Enrolled Nurses (EN) may be allocated to total patient care, but an RN would usually oversee the care. The first report on the models of care project by New South Wales Department of Health discusses that total patient care is the main model utilized since nursing moved to the tertiary sector in Australia and that many graduates have only been educated in total patient care.⁷

In Australia and internationally, the nursing workforce has changed considerably due to multifactorial influences such as budgetary constraints, hospital restructuring, an ageing workforce, advanced practice roles for registered and enrolled nurses, changes in scope of practice, skill mix and introduction of undergraduate nurses, recruitment and retention of staff and increases in complexity of care.^{8,9} The model of care chosen to organize nursing work needs to accommodate all of these influences. The model of care delivery and the effects on patient care have been discussed in the literature and those models with a greater registered nurse skill mix have been linked to improved outcomes such as lower patient mortality and wound infections, and reduction in medication errors.¹⁰ The focus of this review is on the model of nursing care delivery by one of two particular models: team and total patient care, and the effect these care models have on nurses' wellbeing. The reviewer acknowledges the importance of measuring patient clinical outcomes and organizational factors to inform the delivery of safe and cost effective clinical care, however these outcomes will be excluded from the review as there have been previous reviews to inform practice in this area.¹¹⁻¹³

The model of care is critical in defining the nursing work environment. Nursing work environments are complex; prioritising work is essential and the need to reprioritise nursing workloads on a daily basis is

often necessary. Research has shown that nursing work environments and also job satisfaction are influenced by organizational structures, leadership, autonomy, models of care, multidisciplinary collaboration and interpersonal relationships.^{5,14} Ward areas may adapt different models of care due to the knowledge and skill level of staff or to influence teamwork to increase job satisfaction. Organizations need to manage within allocated resources and ensure that they have the most appropriate model to support staff and ensure safe effective clinical outcomes. Regardless of the model of care, all nursing staff are required to practice within their scope of practice and be aware of the scope of their colleagues' practice. Confusion with scope of practice leads to conflict, inter-professional rivalry, and even bullying.¹⁵ Due to the global shortage of nurses and skill mix issues it is important to ensure the organizational model in the clinical area utilizes the skills and experience of the available staff.

Workplace stress and burnout have implications for both the employee and the organization regardless of the workplace. Jennings 2008 citing Lazarus 2004, described stress as a "relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her wellbeing."¹⁶ (p NP) If high stress levels are maintained this could result in burnout. Burnout can be defined as physical or mental collapse caused by overwork or stress.¹⁷ In terms of nursing, stress and burnout can have long standing implications for the nurse on health and job satisfaction and for the employer it can influence turnover and absenteeism.¹⁶

The purpose of this review will be to compare the effectiveness of team nursing and total patient care through evaluating which model of care achieves greater staff wellbeing. Staff wellbeing will be measured by staff outcomes in relation to staff satisfaction, turnover, absenteeism, stress levels and burnout. This review will focus on the acute care hospital sector and in particular general ward settings. To avoid potential duplication of the proposed review topic, searches of the Joanna Briggs Institute Library and The Cochrane Library were undertaken. The search revealed a systematic review has recently been published on this topic which looked at various models of care and the effects these models have on staff and patient outcomes. In particular staff outcomes such as staff satisfaction, role clarity and absenteeism. The review also looked at patient outcomes in terms of nurse sensitive indicators such as falls, medication errors and infection rates. However, the proposed review, while replicating some of the outcome measures used in a review by Fernandez R et al (2012), extends the outcomes to include turnover, stress and burnout and narrows the focus to two models of care delivery. The purpose of replicating some of the outcome measures of staff satisfaction and absenteeism is to extract a clear picture of the differences in the two care models, team nursing and total patient care. There have been quantitative and qualitative reviews conducted on nursing models and the effects on patient, organizational and staff related outcomes.¹¹⁻¹³ but none narrowing the focus to these two models and their direct effect on staff wellbeing.

Finally, it is hoped that this quantitative review will assist in informing practice on these two care delivery models: team nursing and total patient care, by establishing the effect that each model has on the nurses

delivering them. This review will enable a greater understanding of the impact stress and burnout, turnover rates, absenteeism and staff satisfaction have on staff wellbeing. In Australia, the Australian Nursing and Midwifery Council outlines that nurses' scope of practice encompasses activities such as decision making, role and responsibility and function and the scope of practice which is legislated.¹⁸ The role of the registered nurse includes delegation and this requires an understanding of other team member's scope of practice, education level and experience. The reviewer is interested at a local level as currently in Australia there are a number of new hospitals being constructed or under redevelopment and this review may assist in informing practice on the preferred model of care. The review will also be looking at the impact of team and total patient care from a global perspective on staff wellbeing to ensure best available studies which meet the criteria are included in the review.

Inclusion criteria

Definitions

For the purposes of this review the following definitions will be used:

Nurse Turnover: Turnover includes voluntary and involuntary termination, as well as internal and external transfers.¹⁹ Voluntary termination may include transferring from one department to another within the same organization or when nursing staff voluntarily leave or transfer from their employment position. Voluntary termination excludes dismissals, voluntary retirement, and leaves of absence as a result of death, medical or maternity reasons.²⁰ Involuntary termination is where employment is terminated by the employer. Many studies do not distinguish between voluntary and involuntary turnover therefore for the purpose of this study nurse turnover will be defined as the process in which nurses leave or transfer within the hospital environment.

Absenteeism: Absenteeism (unplanned absence) will be defined as non-attendance at work where work attendance is scheduled. This includes sick leave, and may include carers leave and bereavement leave. This leave may be paid or unpaid.²¹ Work related injury leave will be excluded.

Nurse Stress: Defined as the "relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her wellbeing." ¹⁶ (p NP)

Nurse Burnout: Physical or mental collapse caused by overwork or stress.¹⁷

Skill Mix: The combination or grouping of different categories of workers that are employed for provision of care to patients.²² Categories of workers for this review specifically refers to nursing staff employed for provision of care.

Types of participants

This review will consider studies that include all nurses working on general wards in the acute care hospital sector. This includes registered general nurses or the International equivalent such as staff nurse and professional nurse, enrolled nurses or the International equivalent such as licensed vocational nurse or licensed practical nurse and unlicensed personnel such as nursing assistants or the International equivalent such as nurse's aide and auxiliary nurses.

This review will exclude:

Nursing staff working on specialised wards and areas for example intensive/critical care areas, oncology wards, paediatrics, midwifery, mental health, primary care and aged care sectors, as they utilize specific models of care for their scope of practice.

Types of intervention(s)

This review will consider studies that investigate the use of a team nursing model when organizing nursing work. The comparator will be utilization of a total patient care model.

Types of outcomes

The outcome of interest to this review will be staff wellbeing. Methodology for data collection will be grouped from the primary research papers based on the types of outcomes measures or tools that were used to promote homogeneity of pooled data. Data collection tools that have been used in initial searches of papers have included questionnaires for the collection of responses for staff satisfaction. The measurement tools considered for inclusion must be validated and reliable and need to have been previously tested and found to have acceptable techniques, examples of these tools are the Nursing Work Index tool which measures nursing values in relation to job satisfaction and productivity, this tool has been modified and used in various countries including Australia where it is referred to as the Nursing Work Index – Revised: Australian Tool, (NWI-R:A tool).²³ Another reliable tool is the McCloskey/Mueller Satisfaction Scale (MMSS) which is a multidimensional questionnaire designed for hospital staff nurses. There are 31 items; the response format is a five-point Likert scale. The Nurse Satisfaction Scale (NSS) is also a validated tool which measures job satisfaction among nurses. The questionnaire is multidimensional and has 24 items. The response format is a seven-point Likert scale.²⁴

Maslach Burnout Inventory tool has been utilised to measure staff burnout and stress levels other tools that measure staff burnout and stress will be considered for inclusion, providing it is a validated and tested tool for measuring staff burnout and stress levels. Nursing turnover and absenteeism rates will be extracted from included papers. Patient clinical outcomes will be excluded from the review.

Types of studies

This review will consider quantitative studies that focus on but are not limited to staff turnover, absenteeism, staff satisfaction, stress and burnout. Experimental and epidemiological study designs including randomised controlled trials, non-randomised controlled trials, quasi-experimental, before and after studies, prospective and retrospective cohort studies, case control studies and analytical cross sectional studies for inclusion.

This review will also consider descriptive epidemiological study designs including case series, individual case reports and descriptive cross sectional studies for inclusion.

Studies not published in English will be excluded from this review.

Search strategy

The search strategy aims to find both published and unpublished studies. A three-step search strategy will be utilized in this review. An initial limited search of MEDLINE and CINAHL will be undertaken followed by analysis of the text words contained in the title and abstract, and of the index terms used to describe the article. A second search using all identified keywords and index terms will then be undertaken across all included databases. Thirdly, the reference list of all identified reports and articles will be searched for additional studies. Studies published in the English language will be considered for inclusion in the review. Studies published from 1995 to September 2013 will be considered for inclusion in the review. In order to analyse the most current and contemporary body of evidence, this review will only consider published articles from 1995 onwards. To justify this time period it is critical to reflect upon the changes that have occurred within Australia, in relation to a number of influences including nurse education, changes in health acuity and workforce demands also saw the introduction of Assistants in Nursing (AIN's) into the acute care health workforce. Furthermore, since 1995, nursing practice was heavily influenced by regulatory bodies such as the Australian Nursing and Midwifery Council.^{25, 26} These influences have greatly affected and influenced models of care delivery. Studies prior to this period of time, considering the significant movements and changes in workforce dynamics would be superfluous to the outcomes of this systematic review.

The databases to be searched include:

- CINAHL
- PubMed
- Cochrane Library (CENTRAL)
- Scopus
- Embase

- Science Direct

The search for unpublished studies will include:

- MedNar
- ProQuest Dissertations and Theses

Initial keywords: please refer to logic grid: (Appendix I).

Assessment of methodological quality

Quantitative papers selected for retrieval will be assessed by two independent reviewers for methodological validity prior to inclusion in the review using standardised critical appraisal instruments from the Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument (JBI-MAStARI) (Appendix II). Any disagreements that arise between the reviewers will be resolved through discussion, or with a third reviewer.

Data collection

Data will be extracted from papers included in the review using the standardised data extraction tool from JBI-MAStARI (Appendix III). The data extracted will include specific details about the interventions, populations, study methods and outcomes of significance to the review question and specific objectives.

Data synthesis

Quantitative data will, where possible be pooled in statistical meta-analysis using JBI-MAStARI. All results will be subject to double data entry. Effect sizes expressed as odds ratio (for categorical data) and weighted mean differences (for continuous data) and their 95% confidence intervals will be calculated for analysis. Heterogeneity will be assessed statistically using the standard Chi-square and also explored using subgroup analyses based on the different study designs included in this review. Where statistical pooling is not possible the findings will be presented in narrative form including tables and figures to aid in data presentation where appropriate.

Conflicts of interest

No conflicts of interest to declare

Acknowledgements

As this systematic review forms partial submission for the degree award of Masters of Clinical Science, a secondary reviewer (Scott King, MSc candidate) will be utilized for critical appraisal.

I would like to thank my supervisors, Associate Professor Lesley Long AM and Dr Karolina Lisy at the

Joanna Briggs Institute Adelaide for their guidance and support with this review.

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PubMed Database Search Strategy

(Total patient care [TW] OR patient allocation [TW] OR Team nursing [TW] OR nursing, team [MH] OR nursing, team [TW] OR models, nursing [MH] OR models, nursing [TW] OR nursing model* [TW] OR personnel staffing and scheduling [MH] OR personnel staffing and scheduling [TW]) OR nursing care delivery system* [TW] OR patient care delivery system* [TW] OR primary nursing [TW] OR modular nursing [TW] OR functional nursing [TW] OR collegiality [TW]) **AND** (absenteeism[MH] OR absenteeism [TW] OR wellbeing [TW] OR well being [TW] OR well-being [TW] OR job satisfaction[MH] OR job satisfaction [TW] OR personnel turnover [MH] OR personnel turnover [TW] OR turnover [TI&AB] OR stress, psychological [MH] OR stress, psychological [TW] OR stress [TW] OR burnout [TW] OR mental fatigue [MH] OR mental fatigue [TW] OR fatigue [TW] OR burnout, Professional/Nursing [MH] OR sick leave [MH] OR sick leave [TW]) **AND** (nursing staff [MH] OR nursing staff [TW] OR Nursing Staff, Hospital [MH] OR Hospital Units [MH] OR general ward [TW] OR ward units [TW] OR nurses [MH] OR nurses [TW])

Search date: 21/4/2014, articles in English language only.

CINHAL Database Search Strategy

(Nursing Care Delivery Systems+ OR Total Patient Care Nursing OR nursing care delivery systems OR total patient care nursing OR total patient care OR team nursing OR team nursing OR nursing team* OR nursing model* of care OR Personnel Staffing and Scheduling+ OR personnel staffing and scheduling OR patient care delivery system*primary nursing OR "modular nursing OR functional nursing OR Collegiality)**AND** (MH Job Satisfaction OR job satisfaction OR MH Personnel Turnover OR personnel turnover OR MH Stress, Psychological+ OR stress, psychological OR MH Stress, Occupational+ OR stress, occupational OR MH Burnout, Professional OR burnout OR Burnout, Professional OR MH Fatigue+/NU OR mental fatigue OR employee stress OR MH Sick Leave OR Sick Leave OR MH Family and Medical Leave OR MH Quality of Working Life OR quality of working life OR MH Personnel Turnover OR personnel turnover OR MH Personnel Retention OR personnel retention OR MH Psychological Well-Being OR well being OR Psychological Well-Being OR MH Absenteeism OR absenteeism OR MH Nursing Manpower)**AND**(MH Nursing Staff, Hospital OR MH Nurses OR nurses OR MH Hospital Units OR hospital units OR general ward)

Search date: 21/4/2014, articles in English language only.

COCHRANE Database Search Strategy

(Total patient care OR patient allocation OR team nursing OR [Nursing, Team] OR [Models, Nursing] OR [Personnel Staffing and Scheduling] OR primary nursing OR functional nursing OR modular nursing) **AND**

([Absenteeism] OR absenteeism OR [Job Satisfaction] OR wellbeing OR [Personnel Turnover] OR [Stress, Psychological] OR [Burnout, Professional] OR burnout OR sick leave OR [Mental Fatigue] OR job satisfaction) **AND** ([Nursing Staff] OR [Nursing Staff, Hospital] OR [Patients' Rooms] OR general wards OR" hospital units OR nurse)

Search date: 23/4/2014, articles in English language only

SCOPUS Database Search Strategy

(Collegiality OR nursing care delivery system OR total patient care OR team nursing OR nursing team OR nursing model of care OR personnel staffing and scheduling OR patient care delivery system OR primary nursing OR modular nursing OR functional nursing) **AND** (personnel retention OR turnover OR staff turnover OR absenteeism OR wellbeing OR job satisfaction OR occupational stress OR burnout OR mental fatigue OR sick leave OR stress) **AND** (nursing staff OR nurses OR hospital nurses OR wards OR hospital units)

Search date: 21/4/2014, articles in English language only

EMBASE Database Search Strategy

(Nursing care delivery system OR total patient care OR patient allocation OR team nursing OR nursing team OR nursing model of care OR nursing models of care OR patient care delivery system OR patient care delivery systems OR nursing care delivery systems OR modular nursing OR primary nursing OR functional nursing OR personnel management OR Collegiality OR team hierarchy) **AND** (absenteeism OR job satisfaction OR job satisfaction/exp OR personnel turnover OR quality of working life OR job stress/exp OR job stress OR mental fatigue OR burnout professional OR burnout/exp OR sick leave OR medical leave OR personnel retention OR well\$being) **AND** (nursing staff OR hospital units OR nurse OR ward OR nurses/exp)

Search date: 21/4/2014, articles in English language only

Science Direct Database Search Strategy

(Team nursing OR nursing team* OR personnel staffing and scheduling OR nursing care delivery system* OR patient care delivery system* OR primary nursing OR modular nursing OR functional nursing OR nursing model* OR model* of nursing OR total patient care OR patient allocation) **AND** (mental fatigue OR fatigue OR sick leave OR {sick-leave} OR quality of working life OR burnout OR {burn-out} OR professional burnout OR absenteeism OR wellbeing OR {well-being} OR well being OR job satisfaction OR personnel turnover OR turnover OR stress OR psychological stress) **AND** (general ward OR acute care OR hospital unit OR hospital ward)

Search date: 25/4/2014, articles in English language only

ProQuest Dissertations & Theses Database Search Strategy

(Total patient care OR patient allocation OR team nursing OR nursing team OR nursing model* OR model* of nursing OR Models AND Nursing OR personnel staffing and scheduling OR patient care delivery system* OR nursing care delivery system* OR primary nursing OR modular nursing OR functional nursing **AND** personnel turnover OR turnover OR SU.exact TURNOVER AND SU.exact NURSING OR SU.exact HEALTH SCIENCES NURSING OR absenteeism OR SU.exact ABSENTEEISM OR wellbeing OR well being OR quality of working life OR job satisfaction OR SU.exact JOB SATISFACTION AND SU.exact WORK ENVIRONMENT OR PER.exact WORK ENVIRONMENT OR stress OR SU.exact STRESS OR ORG.exact STRESS AND SU.exact NURSING OR SU.exact HEALTH SCIENCES NURSING OR burnout OR SU.exact BURNOUT OR professional burnout OR mental fatigue OR fatigue OR sick leave) **AND** (hospital nurse* OR SU.exact HOSPITALS OR SU.exact HOSPITAL AND SU.exact NURSES OR general ward* OR hospital unit* OR hospital ward*)

Search date: 26/4/2014, articles in English language only

MAStARI appraisal instrument

JBI Critical Appraisal Checklist for Randomised Control / Pseudo-randomised Trial

Reviewer Date

Author Year Record Number

| | Yes | No | Unclear | Not Applicable |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Was the assignment to treatment groups truly random? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Were participants blinded to treatment allocation? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Was allocation to treatment groups concealed from the allocator? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Were the outcomes of people who withdrew described and included in the analysis? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Were those assessing outcomes blind to the treatment allocation? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Were the control and treatment groups comparable at entry? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Were groups treated identically other than for the named interventions? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Were outcomes measured in the same way for all groups? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Were outcomes measured in a reliable way? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Was appropriate statistical analysis used? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Overall appraisal: Include Exclude Seek further info.

Comments (Including reason for exclusion)

MAStARI data extraction instrument

JBI Data Extraction Form for Experimental / Observational Studies

Reviewer Date

Author Year

Journal Record Number

Study Method

RCT Quasi-RCT Longitudinal
Retrospective Observational Other

Participants

Setting _____

Population _____

Sample size

Group A _____ Group B _____

Interventions

Intervention A _____

Intervention B _____

Authors Conclusions:

Reviewers Conclusions:

Study results

Dichotomous data

| Outcome | Intervention () number / total number | Intervention () number / total number |
|----------------|---|---|
| | | |
| | | |
| | | |
| | | |

Continuous data

| Outcome | Intervention () number / total number | Intervention () number / total number |
|----------------|---|---|
| | | |
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Appendix V: Characteristics of included studies

| Study, setting and sample size | Participants | Study design and method | Intervention | Comparator | Outcomes and measures relevant to review | Findings |
|---|--|--|---------------------|---------------------------|--|---|
| <p>Fairbrother et al. (2010)¹⁸</p> <p>New South Wales, Australia</p> <p>12 med/surg wards</p> <p>(n=221)</p> | <p>Gender Not addressed</p> <p>Age Not addressed</p> <p>Designation EN New graduate RN's RN's Clinical nurse specialists</p> <p>Bed capacity Team nursing wards -16-26 beds</p> <p>Total patient care wards - 16-26 beds</p> | <p>Non randomized, quasi-experimental</p> <p>Self-completion surveys</p> | <p>Team nursing</p> | <p>Total patient care</p> | <p>Nursing Workplace Satisfaction Questionnaire (NWSQ)</p> <p>Staff turnover Number of full time equivalent (FTE) vacancies divided by number of FTE's allocated</p> | <p>Higher extrinsic job satisfaction in team nursing wards.</p> <p>An improvement in job satisfaction for graduate nurses in team nursing wards.</p> <p>Enrolled Nurses had a higher job satisfaction at baseline and 12 month follow-up period, although there was a small decrease in job satisfaction at 12 months for this group</p> <p>Overall, job satisfaction equivalent between team nursing and individual patient allocation wards.</p> <p>Reduced vacancy rates in team nursing and individual patient allocation wards.</p> <p>Team nursing wards improved vacancy rates quicker than individual patient allocation wards, however not a statistically significant improvement</p> |

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|---|---|--|---------------------------|---------------------------|---|--|--|--------|----|----|------|----|---|------------|--|--|-----|----|---|-------|----|----|-------|----|----|-----|----|----|--------------------|--|--|----|----|---|----|----|----|--------------------------------------|--|--|--|---------------------|---------------------------|---|---|
| <p>Tran et al. (2010)²⁰</p> <p>New South Wales, Australia</p> <p>4 Medical and 4 Surgical Wards</p> <p>(n=125)</p> | <table border="1"> <tr> <td></td> <td>Team nursing (n=74)</td> <td>Total patient care (n=51)</td> </tr> <tr> <td colspan="3">Gender</td> </tr> <tr> <td>Female</td> <td>64</td> <td>46</td> </tr> <tr> <td>Male</td> <td>10</td> <td>3</td> </tr> <tr> <td colspan="3">Age</td> </tr> <tr> <td><30</td> <td>22</td> <td>5</td> </tr> <tr> <td>30-39</td> <td>12</td> <td>10</td> </tr> <tr> <td>40-49</td> <td>17</td> <td>16</td> </tr> <tr> <td>>50</td> <td>21</td> <td>15</td> </tr> <tr> <td colspan="3">Designation</td> </tr> <tr> <td>EN</td> <td>21</td> <td>7</td> </tr> <tr> <td>RN</td> <td>52</td> <td>41</td> </tr> <tr> <td colspan="3">Bed Capacity Not addressed</td> </tr> </table> | | Team nursing (n=74) | Total patient care (n=51) | Gender | | | Female | 64 | 46 | Male | 10 | 3 | Age | | | <30 | 22 | 5 | 30-39 | 12 | 10 | 40-49 | 17 | 16 | >50 | 21 | 15 | Designation | | | EN | 21 | 7 | RN | 52 | 41 | Bed Capacity Not addressed | | | <p>Quasi-Experimental with a comparison group (before and after design)</p> <p>Self-completion surveys</p> | <p>Team nursing</p> | <p>Total patient care</p> | <p>Job satisfaction- Job Descriptive Index (JDI) and Job in General (JIG) scale</p> <p>Stress at work</p> <p>Stress in General (SIG)</p> <p>Job tension- Tension Index by Lyons</p> | <p>Decrease in satisfaction with co-worker in team nursing wards.</p> <p>Overall minimal difference in models with job satisfaction. A patient allocation model has advantages in wards with predominantly RNs.</p> <p>If a mix of skill and experience then team nursing of benefit.</p> <p>Nurses less satisfied if working with increasing levels of stress, prolonged tension and uncertainty in role.</p> <p>Nurses demonstrated a neutral level of threatening characteristics in their job and A moderate level of pressure.</p> |
| | Team nursing (n=74) | Total patient care (n=51) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gender | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Female | 64 | 46 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Male | 10 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Age | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <30 | 22 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30-39 | 12 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40-49 | 17 | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| >50 | 21 | 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Designation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EN | 21 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RN | 52 | 41 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bed Capacity Not addressed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Wells et al. (2011)</p> <p>Newfoundland and Labrador Canada</p> <p>2 Acute Care units</p> <p>(n=78)</p> | <p>Gender Not addressed</p> <p>Age Not addressed</p> <p>Designation RN-Registered Nurses LPN- Licensed practical nurses</p> <p>Bed Capacity 52 beds</p> | <p>This study was described as a mixed method, longitudinal, descriptive design. Based on methods described it was considered by reviewers to be an uncontrolled before and after experimental study. In this study two acute care nursing units which previously practiced a team nursing model changed to a total patient care model to assess how the change affected</p> | <p>Total patient care</p> | <p>Team nursing</p> | <p>Job satisfaction- Index of Work Satisfaction (IWS)</p> | <p>Low response rates.</p> <p>Nurses mostly satisfied with professional status, interaction and autonomy, least satisfied with tasks, policy and pay.</p> <p>Pay most important job variable.</p> <p>Transition to total patient care did not have a significant effect on job satisfaction.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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|--|--|--|--|--|--|--|
| | | nurse's job satisfaction. Self-completion surveys | | | | |
|--|--|--|--|--|--|--|

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Reason for exclusion: Study does not meet inclusion criteria, discussed clinical specialty.

2. Adams A, Bond S. Hospital nurses' job satisfaction, individual and organizational characteristics. *J Adv Nursing*. 2000; 32(3):536-43.

Reason for exclusion: Study does not meet inclusion criteria, discussed ward environment.

3. Adams A, Bond S. Staffing in acute hospital wards: part 1. The relationship between number of nurses and ward organizational environment. *J Nurs Manage*. 2003; 11(5):287-92.

Reason for exclusion: Study does not meet inclusion criteria, no useable data, compared devolved, two-tier and centralized organization.

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Reason for exclusion: Study does not meet inclusion criteria, compared devolved, two-tier and centralized organization models.

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Reason for exclusion: Study does not meet inclusion criteria, discussed development of scale.

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Reason for exclusion: Study does not meet inclusion criteria, compared devolved, two-tier and centralized organization models.

7. Aiken LH, Clarke SP, Sloane DM, Sochalski JA. An international perspective on hospital nurses' work environments: the case for reform. *Policy Polit Nurs Pract*. 2001; 2(4):255-63.

Reason for exclusion: Study does not meet inclusion criteria, models not compared.

8. Bacon CT, Mark B. Organizational effects on patient satisfaction in hospital medical-surgical units. *J Nurs Adm*. 2009; 39(5):220-7.

Reason for exclusion: Study does not meet inclusion criteria, models not compared.

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Reason for exclusion: Study does not meet inclusion criteria, reviewed models of care in terms of patient outcomes.

10. Boumans NP, Landeweerd JA. Nurses' well-being in a primary nursing care setting in The Netherlands. *Scand J Caring Sci*. 1999; 13(2):116-22.

Reason for exclusion: Study does not meet inclusion criteria, compared different models of care.

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Reason for exclusion: Study does not meet inclusion criteria, models not compared.

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Reason for exclusion: Study does not meet inclusion criteria, qualitative study.

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Reason for exclusion: Study does not meet inclusion criteria, reviewed skill mix and patient outcomes.

14. Estryng-Behar M, Van Der Heijden BIJM, Oginska H, Camerino D, Le Nezet O, Conway PM, et al. The impact of social work environment, teamwork characteristics, burnout, and personal factors upon intent to leave among European nurses. *Med Care*. 2007; 45(10):939-50.

Reason for exclusion: Study does not meet inclusion criteria, models not compared.

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Reason for exclusion: Study does not meet inclusion criteria, reviewed team nursing and total patient care in terms of communication with the interdisciplinary team.

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Reason for exclusion: Study does not meet inclusion criteria, unable to identify pre-implementation model of care.

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Reason for exclusion: Study does not meet inclusion criteria, qualitative study.

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Reason for exclusion: Study does not meet inclusion criteria, qualitative study.

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Reason for exclusion: Study does not meet inclusion criteria, models not compared.

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Reason for exclusion: Study does not meet inclusion criteria, qualitative study.

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Reason for exclusion: Study does not meet inclusion criteria, discussed nursing teamwork.

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Reason for exclusion: Study does not meet inclusion criteria, models not compared.

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Reason for exclusion: Study does not meet inclusion criteria, compared different models of care.

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Reason for exclusion: Study does not meet inclusion criteria, compared different models of care.

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Reason for exclusion: Study does not meet inclusion criteria, compared different models of care.

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Reason for exclusion: Study does not meet inclusion criteria, included all hospital units.

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Reason for exclusion: Study does not meet inclusion criteria, compared different models of care.

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Reason for exclusion: Study does not meet inclusion criteria, compared different models of care.

29. McGillis Hall LM. Nursing staff mix models and outcomes. *J Adv Nursing*. 2003; 44(2):217-26.

Reason for exclusion: Study does not meet inclusion criteria, referred to skill mix models.

30. McGillis Hall L, Doran D. Nurses' perceptions of hospital work environments. *J Nurs Manage*. 2007; 15(3):264-73.

Reason for exclusion: Study does not meet inclusion criteria, compared different models of care.

31. McGillis Hall L, Doran D, Baker GR, Pink GH, Sidani S, O'Brien-Pallas L, et al. Nurse staffing models as predictors of patient outcomes. *Med Care*. 2003; 41(9):1096-109.

Reason for exclusion: Study does not meet inclusion criteria, reviewed models of care in terms of patient outcomes.

32. McGillis Hall L, Doran D, Pink GH. Nurse staffing models, nursing hours, and patient safety outcomes. *J Nurs Adm.* 2004; 34(1):41-5.

Reason for exclusion: Study does not meet inclusion criteria, reviewed models of care in terms of patient outcomes and costs.

33. Needleman J, Buerhaus P, Mattke S, Stewart M, Zelevinsky K. Nurse-staffing levels and the quality of care in hospitals. *New Engl J Med.* 2002; 346(22):1715-22.

Reason for exclusion: Study does not meet inclusion criteria, reviewed staff mix model and focused on patient outcomes and cost of nursing hour per patient day.

34. O'Connell B, Duke M, Bennett P, Crawford S, Korfiatis V. The trials and tribulations of team-nursing. *Collegian.* 2006; 13(3):11-7.

Reason for exclusion: Study does not meet inclusion criteria, qualitative study.

35. Pierce LL, Hazel CM, Mion LC. Effect of a professional practice model on autonomy, job satisfaction and turnover. *Nurs Manage.* 1996; 27(2):48M, 48P, 48R-T.

Reason for exclusion: Study does not meet inclusion criteria, models not compared.

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Reason for exclusion: Study does not meet inclusion criteria, compared different models of care.

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Reason for exclusion: Study does not meet inclusion criteria, compared different models of care.

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Reason for exclusion: Study does not meet inclusion criteria, compared different models of care.

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Reason for exclusion: Study does not meet inclusion criteria, models not compared.

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Reason for exclusion: Study does not meet inclusion criteria, compared different models of care.

Fairbrother G, Jones A, Rivas K. Changing model of nursing care from individual patient allocation to team nursing in the acute inpatient environment. *Contemp Nurse*. 2010; 35(2):202-20.

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EDITORIAL

Can nurses' wellbeing be linked to model of care or other influences?

Nurses make up the largest profession in the health workforce¹ and therefore account for a large component of a hospital's workforce expenditure. The nursing workforce is influenced by many factors which include rapid technological and treatment changes, workforce demographics, budgetary constraints, and recruitment and retention of nursing staff. A productive workforce requires a positive organizational culture at the center of which is the wellbeing of employees. Workforce modeling predicts that if significant reforms are not made in Australia to address issues in training, education and managing demand through increased efficiencies, there will be a shortage of nurses of up to 27%, or approximately 109,000 nurses, by 2025² similar forecasts have been made internationally. In the hospital setting, restructuring or redesigning of nursing work by either reducing the registered nurse skill mix or the number of qualified nurses is a method used to reduce costs. The impact of these strategies on the quality of care nurses provide and on nurses' wellbeing is unclear, however the intention is that patient care is not compromised as a result. Governments, organizations and nursing leaders need to ensure that the current and future nursing workforce is equipped and able to adapt to meet these needs and to meet the community's expectation to receive safe, empathetic and effective care. Organizations need to ensure that staff have the appropriate skills and knowledge base to deliver quality nursing care in a fiscally responsible manner.

The current issues facing the nursing workforce outlined above will continue. Changes in models of care such as creation of advanced practice roles, increasing scope of practice and hospital restructuring are ways in which these issues have been and continue to be addressed.³ The term model of care is used extensively and can broadly be defined as the way in which healthcare services are delivered.⁴ In acute hospital wards, nursing work is organized, allocated and delivered using a number of established nursing models of care; these include but are not limited to team nursing, total patient care, task method and primary nursing.^{5,6} These four nursing models of care are the dominant, traditional models which are internationally recognized and described in the literature, although in recent years other models of care, hybrids or combinations of models have emerged.⁷

The model of nursing care chosen is usually dependent on nursing resources and patient care needs. When reviewing staffing requirements, patient acuity needs to be considered. For example, increased

registered nurse hours per patient day have been linked to decreased rates of pneumonia, sepsis and shock⁸ and can be attributed to better care outcomes for patients.⁹ The number of patients that nurses are caring for is also a significant factor and an increase in the number of patients per nurse can cause failure to rescue, increase in patient mortality, decline in patient safety and decrease in quality of care.¹⁰ These clinical implications and the effect different models of care have on patient outcomes have been addressed in the literature.¹¹ However, the impact of the model of care on outcomes related to nurses' wellbeing has received considerably less attention.

The review published in the current issue of the *JBI Database of Systematic Reviews and Implementation Reports* by King *et al.*¹² aimed to assess the impact of the two dominant models of care used in Australia, team nursing and total patient care, on outcomes related to nurses' wellbeing. Results of the review demonstrated that there was no statistically significant difference in the overall job satisfaction, stress, job tension or staff turnover using a team nursing or a total patient care model. The review did however demonstrate greater satisfaction with the work environment under a team nursing model, and importantly found that graduate nurses were more satisfied within a team nursing compared with a total patient care model. A team nursing model can support novice, inexperienced nursing staff, and may be the most appropriate model when there is a lower registered nurse skill mix, however there must be clarity on the roles and responsibilities of each team member to ensure satisfaction with co-workers. A significant difficulty encountered during the conduct of this review was inconsistency in the terminology and language used to name and describe the models of care in the literature, highlighting the need for consensus on terminology.

Findings from the review may assist policy makers, nursing leaders and hospital executives in determining an evidence-based decision on which model of care to implement to achieve the best outcomes for nurses' wellbeing. However, the review indicated that issues such as leadership, skill mix, retention of staff and clearly defined nursing roles may have a greater influence on nurses' wellbeing than model of care. Nursing leaders and organizations need to foster and develop healthy productive workplaces to achieve optimum patient outcomes in a cost effective environment. Nursing knowledge, experience, skill level, workload and patient acuity should be the priority in determining the model of care.

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Dr Karolina Lisý

Research Fellow, Implementation Science, The Joanna Briggs Institute

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11. McGillis Hall L, Doran D, Pink GH. Nurse staffing models, nursing hours, and patient safety outcomes. *J Nurs Adm*. 2004; 34(1):41-5.
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JBI Grades of Recommendation

A '**strong**' recommendation for a certain health management strategy where:

- Grade A
1. it is clear that desirable effects outweigh undesirable effects of the strategy;
 2. where there is evidence of adequate quality supporting its use;
 3. there is a benefit or no impact on resource use, and
 4. Values, preferences and the patient experience have been taken into account.

A '**weak**' recommendation for a certain health management strategy where:

- Grade B
1. desirable effects appear to outweigh undesirable effects of the strategy, although this is not as clear;
 2. where there is evidence supporting its use, although this may not be of high quality;
 3. there is a benefit, no impact or minimal impact on resource use, and
 4. Values, preferences and the patient experience may or may not have been taken into account.