

The Experience and Effectiveness of Nurse Practitioners in Orthopaedic Settings: A Comprehensive Systematic Review

Reviewers

Anita Taylor¹ RN, ONP, OrthoNCert, GradDipOrtho, MNSc

Professor Deb Kralik² RN, PhD, in memoriam

Doctor Kylie Porritt³ PhD

1 Orthopaedic Nurse Practitioner and MClinc candidate, The Joanna Briggs Institute, Faculty of Health Sciences, The University of Adelaide

2 Head, Quality, Research and Innovation at Silver Chain, Royal District Nursing Services SA Group and Adjunct Professor, The University of Adelaide, The Joanna Briggs Institute, Faculty of Health Sciences, The University of Adelaide, SA 5005

3 Research Fellow, The Joanna Briggs Institute, Faculty of Health Sciences, The University of Adelaide

Corresponding author email: anita.taylor@health.sa.gov.au

Table of Contents

Table of Contents.....	2
Figures 1-5	7
Tables 1-19	7
Abstract	8
Background.....	8
Objective	8
Inclusion Criteria.....	8
Types of Participants.....	8
Types of Interventions.....	8
Phenomena of Interest	8
Types of Studies.....	8
Types of Publications	9
Types of Outcomes	9
Search Strategy.....	9
Methodological Quality	9
Data Collection.....	9
Data Analysis/Synthesis	10
Results	10
Conclusions	11
Student Declaration.....	12
Chapter 1: Introduction	13
1.1 Introduction.....	13
1.2 Structure	13
1.3 Study Aims & Objectives	13
1.4 PICO.....	14
1.4.1 Population/Types of Participants.....	14
1.4.2 Types of Interventions/Phenomena of Interest	14
1.4.3 Comparator	15
1.4.4 Outcomes of Interest/Types of Outcomes.....	15
1.5 Context of the review: extant literature	15
1.5.1 Role and Importance of the NP	17
1.5.2 Advanced Nursing Practice.....	18

1.5.3 International Context	19
1.5.4 US.....	19
1.5.5 Canada	20
1.5.6 UK.....	20
1.5.7 Australia.....	21
1.5.8 Other Countries	22
1.5.9 Orthopaedic Nursing and Specialism	23
1.5.10 Advanced Practice in Orthopaedic Nursing	24
1.5.11 Domain of Orthopaedic Nursing	24
1.5.12 Workforce and Bone & Joint Health	25
1.5.13 Bone & Joint Health	25
1.5.14 Workforce.....	25
1.6 Discussion of the methodological basis of the chosen approach to analysis & synthesis	26
1.6.1 Systematic Review Methodology.....	26
1.6.2 JBI Approach	26
1.6.3 Mixed Methods.....	28
1.6.4 Methodology of Included Studies.....	29
1.7 Assumptions, limitations and delimitations	31
1.8 Key concepts.....	31
1.9 Chapter Summary	32
Chapter 2.....	34
2.1 Statement of Authorship.....	35
2.2 JBISRIR Protocol.....	36
Chapter 3.....	58
3.1 Statement of Authorship.....	59
3.2 JBISRIR Comprehensive Systematic Review Report	60
Executive Summary.....	60
Background	60
Objective.....	61
Inclusion Criteria	61
Search Strategy	61
Methodological quality.....	61
Data Collection.....	62
Data Analysis/Synthesis	62

Results.....	62
Conclusions	63
Introduction.....	63
Background	63
Justification for a comprehensive review	64
Review Question/Objective.....	66
Inclusion criteria.....	66
<i>Types of participants</i>	66
<i>Types of Intervention(s)/Phenomena of Interest</i>	66
<i>Setting</i>	67
<i>Comparators</i>	67
<i>Types of Outcomes</i>	67
<i>Types of Studies</i>	67
Search Strategy	68
Methods of the Review	69
Assessment of methodological quality	69
Data Extraction	69
Data Synthesis.....	69
Results.....	70
Description of studies	70
Methodological quality and context of included studies.....	72
<i>Quantitative Evidence</i>	72
<i>Qualitative Evidence</i>	72
<i>Text & Opinion Evidence</i>	72
Findings of the Review	74
Quantitative Findings.....	74
<i>Impact of ONP Care in Joint Arthroplasty:</i>	75
<i>Impact of ONP Care in Fracture Care and Management</i>	79
<i>Impact of ONP Care in Osteoporosis</i>	82
<i>Impact of ONP Care in Hip Dysplasia</i>	83
<i>Impact of ONP Care in Spine</i>	84
<i>Impact of ONP Care in Carpal Tunnel</i>	85
<i>Impact of ONP Care in Orthopaedic Pain Management</i>	86
<i>Impact of ONP Care in Trauma</i>	87

<i>Impact of ONP Care on Nurse or Process related Outcomes</i>	88
Qualitative Findings.....	93
Text & Opinion Review Results.....	94
<i>Synthesised Finding 1: Duality</i>	95
<i>Synthesised Finding 2: Role & Relationships</i>	97
<i>Synthesised Finding 3: Moving Forward along a Continuum</i>	101
Discussion.....	108
Overview of quantitative evidence.....	108
Overview of qualitative evidence.....	108
Overview of evidence of text and opinion.....	108
Duality for the ONP	109
Limitations of the Review	109
Conclusion	109
Implications for practice.....	109
Implications for research	110
Conflicts of Interest.....	110
Acknowledgements.....	110
Appendix 1 Search Strategy	115
Appendix 2 Checklist for Critical Appraisal.....	120
Appendix 3 JBI MASTARI critical appraisal instrument.....	121
Appendix 4 JBI QARI critical appraisal instrument.....	123
Appendix 5 JBI NOTARI critical appraisal instrument.....	124
Appendix 6 JBI MASTARI Data Extraction Tool	125
Appendix 7 JBI QARI Data Extraction Tool.....	127
Appendix 8 JBI NOTARI Extraction Tool	129
Appendix 9 Excluded Studies	131
Appendix 10 Included Studies.....	135
Appendix 11 Critical Appraisal Quantitative evidence.....	144
Appendix 12 Critical Appraisal Qualitative Evidence	146
Appendix 13 Critical Appraisal Text/Opinion Evidence.....	147
Chapter 4: Conclusion	148
4.1 Chapter Introduction	148
4.2 Overview of Evidence	148
4.3 Quantitative Evidence.....	148

4.4 Qualitative Evidence	149
4.5 Evidence from Text & Opinion	150
4.6 Shared Findings.....	151
4.6.1 Shared Finding 1: Acceptance.....	153
4.6.2 Shared Finding 2: Collaboration.....	153
4.6.3 Shared Finding 3: Education/Knowledge/Experience	153
4.6.4 Shared Finding 4: Duality.....	154
4.7 Practice, Policy and Political Implications and Implementation to Practice.....	154
4.7.1 Translation through Mentorship & Sponsorship.....	155
4.8 Evidential Base for Nurse Practitioners	156
4.9 Implications for Research.....	158
4.11 Conclusion	159
4.12 A Final Word.....	160
4.13 Limitations.....	160
Acknowledgements.....	160
References.....	161
Appendix 1 Checklist for Critical Appraisal.....	168

Figures 1-5

Figure 1 – The Joanna Briggs Institute conceptual model for evidence-based health care (chapter 1)

Figure 2 – Flow chart illustrating the study assessment and selection process (chapter 3)

Figure 3 – Meta-view graph from NOTARI (chapter 3)

Figure 4 – Shared Findings diagram (chapter 4)

Figure 5 – Duality diagrammatic representation (chapter 4)

Tables 1-19

Table 1 - Outcomes of ONP Assessment in Joint Arthroplasty: Access & Wait times, Surgical Targets, Quality of Care

Table 2 - Complications in Joint Arthroplasty

Table 3 - Quality of Care in Joint Arthroplasty

Table 4 - Satisfaction & Acceptance in Joint Arthroplasty

Table 5 - Clinical accuracy in radiological assessment in fracture care management

Table 6 - Clinical accuracy in fracture care

Table 7 - Complications & Readmissions in Fracture Care

Table 8 - Osteoporosis Screening and Management

Table 9 - ONP impact in Developmental Dysplasia of the Hip (DDH)

Table 10 - ONP Care in Spine clinic

Table 11 - ONP Care in Carpal Tunnel

Table 12 - ONP Care in Pain Management

Table 13 - Complications in Trauma

Table 14 - Education as an NP outcome

Table 15 - LOS/Cost

Table 16 - Barriers to ONP practice

Table 17 – Notari Synthesised Finding 1

Table 18 – Notari Synthesised Finding 2

Table 19 – Notari Synthesised Finding 3

Abstract

Background

There is commonality amongst the definition and characteristics of Nurse Practitioner (NP)/Advanced Practice Nurse (APN) role and practice internationally in terms of education, practice standards and regulation; operationally there is variability. The NP role has been implemented internationally; at least 70 countries are considering some form of APN role.^{ICN/APN network 2012 cited in}(1) NPs provide advanced clinical care and were implemented as part of health service reform to improve access and timeliness of healthcare.⁽²⁾ Whilst much has been written on advanced practice nursing roles per se, there has been little focus specifically on the orthopaedic nursing context. This review will focus on orthopaedic nurse practitioners (ONP) in an international context.

Objective

To appraise and synthesise the best available evidence on the experience and effectiveness of the role and practice of ONPs.

Inclusion Criteria

Types of Participants

ONP/APN in acute care or sub-acute orthopaedic settings.

Types of Interventions

Interventions of ONP specific care.

Phenomena of Interest

The experience of becoming or being an ONP in relation to role development, role implementation and (ongoing) role evaluation.

Types of Studies

This comprehensive systematic review looked at both quantitative and qualitative studies together with narrative text and opinion papers. Quantitative study designs included in this review included observational cohort/case control studies and descriptive case report/series. Phenomenology was the qualitative study design included. Mixed method studies were also included in this review.

Types of Publications

The textual component of this review considered publications of expert opinion, discussion papers, position papers and other relevant text where there existed a particular focus on the 'orthopaedic' aspect of NP practice.

Types of Outcomes

A range of outcome measures were included but were not limited to primary patient outcomes: occasions of service/numbers seen, length of stay (LOS), wait times, patient satisfaction, readmission, and other patient encounter data or relevant nurse-sensitive outcome data that characterised ONP practice. Secondary and related outcomes data relative to process indicators/outcomes such as: NP satisfaction, key stakeholder (other health professional) satisfaction, knowledge, LOS, cost benefit were considered.

Search Strategy

Both published and unpublished English language studies were considered from individual database inception and searched up to December 2012. The search was repeated in early 2013 to ensure no recent papers had been published. A three step search strategy was employed for each component of this review.

Methodological Quality

All retrieved studies and opinion papers were assessed by two independent reviewers using the standardised Joanna Briggs Institute critical appraisal tools. Any disagreements that arose between the reviewers were resolved through discussion, or with a third reviewer.

Data Collection

Quantitative data was extracted using the JBI-MAStARI tool. The data extracted included details about the interventions, populations, study methods and outcomes of significance to the review question.

Qualitative data was extracted using the JBI-QARI tool. The data extracted included details about the methodology, method, phenomena of interest, participants, data analysis and relevant findings.

Textual data was extracted using JBI-NOTARI tool. The data extracted included the type of text,

stated allegiance or position, setting, geographical and cultural influences and messages and conclusions located within the publication.

Data Analysis/Synthesis

Quantitative data was analysed using JBI-MAStARI. Meta-analysis of the quantitative data was not possible due to a lack of clinical and statistical heterogeneity; findings were presented in narrative format including tables to aid in data representation.

As only one qualitative study was included, meta-synthesis by meta-aggregation was not possible.

Textual data were synthesised using the Joanna Briggs Institute approach of aggregation using JBI-NOTARI.

Results

A total 31 studies and publications were included in the review.

Nineteen quantitative studies were included, 10 comparable cohort and 9 descriptive studies. Seven broad review outcomes measures were identified: Three of which were patient related (*primary*) outcomes and three nurse related (*secondary*) outcomes. Three sub category patient-related outcomes focussed on (1) specialist care interventions, (2) patient satisfaction/acceptance, (3) wait times and access to care. Another four sub category nurse-related or process-related review outcomes focussed on (4) education, (5) length of stay, (6) other cost-related issues and (7) barriers.

One unpublished qualitative thesis discussed four themes: (1) having knowledge, (2) being in and outside the role, (3) being an advocate and (4) being in control with decision making & anticipation as sub themes. The author concluded that advanced practice is a continuum.

Eleven text and opinion publications were included where 39 conclusions were identified. From these conclusions eight categories emerged and three synthesised findings. The synthesised findings related to 'Duality', 'Role & Relationships' at a personal, organisational and professional level with an emphasis on collaboration, and 'Moving Forward' with an emphasis on resources needed to support the NP in this.

Conclusions

The findings of this comprehensive review demonstrate the experience and effectiveness of NPs in orthopaedic settings is influenced by multiple factors from within and external to the individual. Overall the results derived from quantitative evidence indicated that NPs in orthopaedic settings provide comparable care when compared to conventional methods of health care delivery. However the results showed better outcomes in specific units where care is led by Clinical Nurse Specialists, NP management of distal radius fracture, and NP screening for developmental hip dysplasia. Decreased length of stay, improved patient wait times & access and patient satisfaction were demonstrated across the evidence, generally. Caution is required however when interpreting the results due to the lower quality of study designs.

The qualitative and textual evidence demonstrated that the role of the ONP is multidimensional with confidence, knowledge and experience as essential elements to deal with complex and challenging situations. The experience of becoming or being an ONP is relational and collaborative at a personal, organisational and professional level. A 'duality' of purpose for ONP's emerged from the textual evidence with interplay between benefits and barriers to ONP practice. Barriers as an outcome emerged from both quantitative and textual evidence. The experience of ONP is characterised by moving forward along a continuum – where the continuum represents the entire journey/career/professional life of the NP. From the comprehensive evidence on the effectiveness and experience of NPs in orthopaedic settings this review identified four 'shared findings' across the evidence base: Acceptance, Collaboration, Education/Knowledge/Experience, Duality.

Keywords Orthopaedic nurse practitioner, advanced practice nurse, extended practice, expert nurse, systematic review, effectiveness, experience

Student Declaration

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

I give consent to this copy of my thesis when deposited in the University Library, being made available for loan and photocopying, subject to the provisions of the Copyright Act 1968. The author acknowledges that copyright of published works contained within this thesis resides with the copyright holder(s) of those works.

I also give permission for the digital version of my thesis to be made available on the web, via the University's digital research repository, the Library Search and also through web search engines, unless permission has been granted by the University to restrict access for a period of time.

Signed:

Dated: