THE PROFILE OF PAIN
IN OLDER WOMEN WITH ARTHRITIS

A thesis presented by

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To the

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PREFACE

DECLARATIONS

Statement of Originality

*The thesis contains no material which has been accepted for the award of any other degree or diploma 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. I give consent to the final version of my thesis being made available worldwide when deposited in the University's Digital Repository**, subject to the provisions of the Copyright Act 1968.*

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Statement of Collaboration

I hereby certify that the work embodied in this thesis has been done in collaboration with other researchers. I have included as part of the thesis a statement clearly outlining the extent of collaboration, with whom and under what auspices.

10th March 2016

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Katie de Luca Date

Statement of Authorship

I hereby certify that the work embodied in this thesis contains published papers of which I am a joint author. I have included as part of the thesis a written statement, endorsed by my supervisor, attesting to my contribution to the joint publications work.

10th March 2016

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Katie de Luca Date

Thesis by Publication

I hereby certify that this thesis is in the form of a series of published papers of which I am a joint author. I have included as part of the thesis a written statement from each co-author, endorsed by the Faculty Assistant Dean (Research Training), attesting to my contribution to the joint publications.

10th March 2016

_____ _____

Katie de Luca Date

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I am thankful to the women who provided detailed information on their experiences of health, pain and arthritis in the *Profile of Pain in Older Women with Arthritis Study.* This research would not have been possible without them, and their commitment to participate in ALSWH to aid in the investigations of women's' health and wellbeing is invaluable.

DEDICATIONS

This thesis is dedicated to my husband Troy de Luca, and our family. Troy, without your unwavering support for me to pursue my “nerdiness” or thirst for learning, this thesis would never have been possible. You are my rock. Thank you. To my beautiful three children - Marcus (4), Alexander (2) and Ivy (0) – you are the loves of my life. I hope to inspire you to explore your world and believe in yourself and seek beauty, charm and adventure as you grow. You guys have provided me with the laughs and distractions to remain focused and determined during this time. Finally, to my parents Phil and Jenny Hardy, thank you. You have always been my staunchest supporters and have provided me with unconditional love and direction throughout my life. This thesis would not have been possible without your understanding and many hours of babysitting.

LIST OF PAPERS INCLUDED AS PART OF THE THESIS

Paper 1

de Luca K, Parkinson L, Pollard H, Byles J, Blyth F. How is the experience of pain measured in older, community-dwelling people with osteoarthritis? A systematic review of the literature. Rheumatology International 2015;35:1461-1472. IF:1.516
DOI: 10.1007/s00296-015-3268-3

Paper 2

de Luca K, Parkinson L, Byles J. A study protocol for the profile of pain in older women: assessing the multi-dimensional nature of the experience of pain in arthritis. Chiropractic & Manual Therapies 2014;22:28.
DOI:10.1186/s12998-014-0028-5

Paper 3

de Luca K, Parkinson L, Byles J, Lo TKT, Pollard H, Blyth F. The prevalence and cross-sectional associations of neuropathic-like pain among older, community-dwelling women with arthritis. Pain Medicine 2016;0:1–9. IF:2.243

Paper 4

de Luca K, Parkinson L, Downie A, Byles J, Blyth F. Identification of three subgroups of pain profiles in 227 older, community-dwelling women with arthritis via latent class analysis: results from a cross-sectional study. *Submitted for peer-review*, Arthritis Research & Therapy. IF:3.75

LIST OF ADDITIONAL PAPERS RELEVANT TO, BUT NOT INCLUDED IN, THE THESIS

Additional Paper 1

de Luca K, Parkinson L, Haldeman S, Byles J, Blyth F. How is spinal pain associated with comorbidity? A cross-sectional analysis of the relationship between spinal pain and chronic diseases. *Manuscript in preparation.*

LIST OF CONFERENCE PRESENTATIONS RELEVANT TO THE THESIS

Conference Podium Presentations

1. **de Luca K**, Parkinson L, Downie A, Byles J, Blyth F. Three subgroups of pain phenotypes in 227 older, women with arthritis. CAA National Research Symposium, Melbourne, Australia, October 2015.
   - **Chiropractors Association of Australia National award winning podium: Grand Prize for Research Excellence**
2. **de Luca K**, Parkinson L, Byles J, Blyth F, Pollard H. How catastrophic are different types of pain in women with arthritis. 142nd APHA Annual Meeting and Exposition, New Orleans, USA. November 15-19 2014.
3. **de Luca K**, Parkinson L, Byles J, Blyth F, Pollard H. How does neuropathic pain affect quality if life in women with arthritis. 142nd APHA Annual Meeting and Exposition, New Orleans, USA. November 15-19 2014.
4. **de Luca K**, Parkinson L, Byles J, Blyth F, Pollard H. How does neuropathic pain affect quality if life in women with arthritis. COCA Biennial Conference. Sydney, Australia, October 2014.
5. **de Luca K**, Parkinson L, Byles J, Blyth F, Pollard H. How does neuropathic pain affect quality if life in women with arthritis. CAANSW Inaugural Research symposium. Sydney, Australia, September 2014.
6. **de Luca K**, Parkinson L, Byles J, Blyth F, Pollard H. Pain and the older woman: results from a cross-sectional survey. AAG & ACS Regional Conference. Port Macquarie, Australia. March 5-7, 2014.
7. **de Luca K**, Parkinson L, Byles J, Blyth F, Pollard H. A Cross sectional survey of pain in older women with arthritis: Study protocol. Emerging Researchers In Ageing National Conference, Brisbane, Australia, November 2012.

Conference Poster presentation

1. **de Luca K**, Parkinson L, Haldeman S, Byles J. Is spinal pain associated with comorbidity? A cross-sectional analysis of the relationship between spinal pain and lifestyle diseases. CAA National Research Symposium, Melbourne, Australia, October 2015.

- **Chiropractors Association of Australia National award winning poster: Best Post Graduate Student (Masters of Research or PhD student) and Prize for Research Excellence**

2. **de Luca K**, Parkinson L, Downie A, Byles J, Blyth F. Mild, moderate or severe pain? How 227 older women living with arthritis have different profiles of the multi-dimensional experience of pain and the impact of profile membership on their health. 2nd CAANSW Research Symposium. Sydney, September, 2015.
3. **de Luca K**, Parkinson L, Byles J, Lo TKT, Blyth F, Pollard H. The prevalence and impact of neuropathic like pain in older women with arthritis. 2nd CAANSW Research Symposium. Sydney, September, 2015.
4. **de Luca K**, Parkinson L, Byles J, Blyth F, Downie A. Discovering three distinct profiles of pain in 227 older women with arthritis. World Federation of Chiropractic, 12th Biennial Conference. Greece, May 2015.
5. **de Luca K**, Parkinson L, Byles J, Lo TKT, Blyth F, Pollard H. The prevalence and impact of neuropathic pain in older women with arthritis. World Federation of Chiropractic 12th Biennial Conference. Greece, May 2015.
   - **World Federation of Chiropractic award winning poster: Best regional poster award.**
6. **de Luca K**, Parkinson L, Byles J, Blyth F, Downie A How catastrophic are different types of pain in women with arthritis. 7th World Congress, World Institute of Pain. Maastricht, Netherlands. May 7-10 2014.
7. **de Luca K**, Parkinson L, Byles J, Blyth F, Pollard H. How is the experience of pain measured in older, community dwelling women with osteoarthritis – A systematic review of the literature. 7th World Congress, World Institute of Pain. Maastricht, Netherlands. May 7-10 2014.
8. **de Luca K**, Parkinson L, Byles J, Blyth F, Pollard H. How does neuropathic pain affect quality if life in women with arthritis. 7th World Congress, World Institute of Pain. Maastricht, Netherlands. May 7-10 2014.
9. **de Luca K**, Parkinson L, Byles J, Blyth F, Pollard H. How is the experience of pain measured in older, community dwelling people with osteoarthritis – A systematic review of the literature. Emerging Researchers In Ageing National Conference, Brisbane, November 2012.

10. **de Luca K**, Parkinson L, Byles J, Blyth F, Pollard H. Development and pilot of a survey instrument for measuring pain in older women with arthritis. Emerging Researchers In Ageing National Conference, Brisbane, November 2012.
11. **de Luca K**, Parkinson L, Byles J, Blyth F, Pollard H. How is the experience of pain measured in older, community dwelling people with osteoarthritis – A systematic review of the literature. COCA National Conference, Sydney, October 2012.
12. **de Luca K**, Parkinson L, Byles J, Blyth F, Pollard H. Development and pilot of a survey instrument for measuring pain in older women with arthritis. COCA National Conference, Sydney, October 2012.
13. **de Luca K**, Parkinson L, Byles J, Blyth F, Pollard H. A cross sectional survey of pain in older women with arthritis: A study protocol. COCA National Conference, Sydney, October 2012.

CONTENTS

PREFACE ..... **i**

Declarations i

Acknowledgements iii

List of papers included as part of the thesis v

List of additional papers relevant to, but not included in, the thesis v

List of conference presentations relevant to the thesis vi

Conference podium presentations vi

Conference poster presentation vi

CONTENTS ix

List of tables xiii

List of figures xv

List of appendices xvi

SYNOPSIS xvii

INTRODUCTION **1**

Arthritis 1

Pain in arthritis 3

Mechanisms of pain in arthritis 5

Neuropathic pain 8

Arthritis and neuropathic pain 10

Epidemiological studies of arthritis 11

Studies of pain in arthritis 12

Management of pain in arthritis 14

Management of neuropathic pain 17

Future directions 21

Conclusions 21

STRUCTURE OF THESIS **22**

THE PROFILE OF PAIN IN OLDER WOMEN WITH ARTHRITIS STUDY **23**

Rationale 23

Design 23

AIMS OF THE THESIS **24**

References 25

PAPER 1 43

How is the experience of pain measured in older, community dwelling people with osteoarthritis? A systematic review of the literature. 43

SYNOPSIS 43

Abstract 44

Introduction 45

Methods 47

Results 48

Discussion 52

Conclusions 56

References 56

PAPER 2 72

A study protocol for the profile of pain in older women: Assessing the multi-dimensional nature of the experience of pain in arthritis 72

SYNOPSIS 72

Abstract 73

Background 73

Methods 75

Discussion 78

Conclusion 79

References 80

PAPER 3 88

The prevalence and cross-sectional associations of neuropathic-like pain among older, community-dwelling women with arthritis. 88

SYNOPSIS 88

Abstract 89

Introduction 90

Methods 91

Results 93

Discussion 95

Conclusion 100

References 100

PAPER 4 105

Identification of three subgroups of pain profiles in 227 older, community-dwelling women with arthritis via latent class analysis: results from a cross-sectional study. 105

SYNOPSIS 105

Abstract 106

Introduction 107

Methods 108

posterior probabilities across one to ten cluster models.Results 113

Discussion 117

References 123

DISCUSSION 128

SYNOPSIS 128

Paper 1 129

Paper 2 132

Paper 3 133

Paper 4 135

STRENGTHS AND LIMITATIONS OF THE THESIS 137

Representativeness of the study sample 137

Response rate of the study sample 138

Appropriateness of the measures used 138

Data entry and missing data 139

Cross-sectional study design limitations 142

Profile of Pain in Older Women with Arthritis Study arthritis definition 143

IMPLICATIONS OF FINDINGS AND RECOMMENDATIONS FOR FUTURE RESEARCH 144

CONCLUSION 145

References 146

APPENDICES 156

Appendix 1: Paper 1 156

Appendix 1.1: Statements of contribution from co-authors 156

Appendix 1.2: The Effective Public Health Practice Project (EPHPP) quality assessment tool for quantitative studies. 159

Appendix 1.3: Data Extraction Tool 163

Appendix 2: Paper 2 164
Appendix 2.1: Published Paper 164
Appendix 2.2: Statements of contribution from co-authors 171
Appendix 3: Paper 3 174
Appendix 3.1: Statements of contribution from co-authors 174
Appendix 4: Paper 4 177
Appendix 4.1: Statements of contribution from co-authors 177
Appendix 5: Additional Paper 1 180
Appendix 5.1: How is spinal pain associated with comorbidity? A cross-sectional analysis of the relationship between spinal pain and chronic diseases. 180
Appendix 5.2: Statements of contributions from co-authors 196
Appendix 6: Study information packages 199
Appendix 6.1: Certificates of ethics approvals 199
Appendix 6.2: WHA Profile of Pain in Older Women with Arthritis Study – Information for participants 202
Appendix 6.3: WHO Profile of Pain in Older Women with Arthritis Study – Participant consent form 204
Appendix 6.4: WHA Profile of Pain in Older Women with Arthritis Study – Survey 205
Appendix 6.5: WHA Profile of Pain in Older Women with Arthritis Study: Reminder leaflet 225
Appendix 6.6: WHO Profile of Pain in Older Women with Arthritis Study – Thank you leaflet 226

LIST OF TABLES

Paper 1

Table 1.1: Characteristics and methodological quality grade of the 11 included studies, ordered by publication date 65

Table 1.2: Dimensions of the osteoarthritis pain experience measured by eleven studies included in this review 70

Paper 2

Table 2.1: Health, arthritis and pain measures used to assess multiple dimensions of pain in arthritis in this study 80

Paper 3

Table 3.1: Socio-demographic characteristics of older women with arthritis, with nociceptive or neuropathic-like pain 94

Table 3.2: Health and pain characteristics of older women with arthritis, with nociceptive or neuropathic-like pain 95

Table 3.3: Univariable logistic regression analysis of neuropathic-like pain in older women with arthritis (n=147) 96

Table 3.4: Multiple variable logistic regression analysis of variables associated with neuropathic-like pain in older women with arthritis (n=147) 99

Paper 4

Table 4.1: Ordinal categories of the Graded Chronic Pain Scale and the McGill Pain Questionnaire (Short Form) present pain intensity subscale 108

Table 4.2: Socio-demographic characteristics of the total sample and socio-demographic characteristics by cluster 110

Table 4.3: Latent class analysis goodness of fit indices and posterior probabilities across one to ten cluster models 113

Table 4.4: The overall proportions of each variable count per cluster 115

Table 4.4: Difference in proportions of women classified in the 3-cluster latent class analysis model, between women with arthritis as compared to women with osteoarthritis 117

Discussion

Table 5.1: Missing data for measures of health, pain and arthritis for the sample and for women with arthritis 140

Table 5.2: Descriptive statistics of the sample 141

Table 5.3: Descriptive statistics of women with arthritis 142

Appendices - Additional Paper 1

Table 6.1: Sample characteristics of 579 community-dwelling older women, and the proportion of comorbidities between women with and without self-reported spinal pain 200

Table 6.2: Association between type and number of comorbidity for women with self-report spinal pain compared with women without spinal pain 201

LIST OF FIGURES

Paper 1

Figure 1.1: A flow chart of the PRISMA screening and selection process 50

Paper 4

Figure 4.1: Response probabilities of each pain dimension variable, per cluster: cluster one (n=95), cluster two (n=83) and cluster three (n=49) 118

Figure 4.2: Risk profile for cluster two and cluster three, compared to cluster one .. 120

LIST OF APPENDICES

Appendix 1: Paper 1

Appendix 1.1: Statements of contribution from co-authors 156

Appendix 1.2: The Effective Public Health Practice Project (EPHPP) quality assessment tool for quantitative studies. 159

Appendix 1.3: Data Extraction Tool 163

Appendix 2: Paper 2

Appendix 2.1: Published paper 164

Appendix 2.1: Statements of contribution from co-authors 171

Appendix 3: Paper 3

Appendix 3.1: Statements of contribution from co-authors 174

Appendix 4: Paper 4

Appendix 4.1: Statements of contribution from co-authors 177

Appendix 5: Additional Paper 1

Appendix 5.1: Manuscript in preparation 180

Appendix 5.2: Statements of contribution from co-authors 196

Appendix 6: Study information packages

Appendix 6.1: Certificates of ethics approvals 199

Appendix 6.2: Profile of Pain in Older Women with Arthritis Study - Information for participants 202

Appendix 6.3: Profile of Pain in Older Women with Arthritis Study – Participant consent form 204

Appendix 6.4: Profile of Pain in Older Women with Arthritis Study – Survey 205

Appendix 6.5: Profile of Pain in Older Women with Arthritis Study – Reminder leaflet 225

Appendix 6.6: Profile of Pain in Older Women with Arthritis Study – Thank you leaflet 226

SYNOPSIS

Arthritis covers a diverse group of diseases commonly involving degeneration and inflammation of the joints. It is very common, estimated to affect 18.5% of the Australian population, or approximately 3.9 million people. Although pain is the most prevalent presenting symptom in the very debilitating condition of arthritis, it has been insufficiently researched and therefore is not well understood, nor well managed in clinical practice. Traditionally, pain in arthritis has been attributed to peripheral, local tissue injury and the mechanism of nociceptive pain. However, the understanding of the experience of pain in arthritis is being increasingly broadened to include the complex interactions between nociceptive and neuropathic mechanisms. Recently, the Osteoarthritis Research Society International (OARSI) and the US Food and Drug Administration (FDA) have called for research to define the disease state of arthritis, and this includes the identification and evaluation of different types of pain in arthritis.

The aim of this thesis was to explore the experience and impact of pain in arthritis. Specifically, this thesis focuses on the multi-dimensional nature of the experience of pain in older women with arthritis. This thesis by publication comprises a series of four papers, constituting elements of an integrated project. The flow of the thesis includes an introduction, chapters consisting of four inter-related papers, a discussion and a conclusion.

Paper 1 is a systematic review of the literature on how the experience of pain is measured in older, community dwelling people with osteoarthritis. This paper concluded that the most commonly used measures of pain do not effectively assess the multi-dimensional nature of the experience of pain in osteoarthritis, nor have the majority of epidemiological studies in arthritis captured the multi-dimensional nature of the experience of pain in osteoarthritis.

In acknowledging the findings from Paper 1, the *Profile of Pain in Older Women with Arthritis Study* was undertaken to better assess the multi-dimensional nature of the experience of pain in arthritis. **Paper 2** outlines the study protocol for the *Profile of Pain in Older Women with Arthritis Study* and discusses the appropriateness of eleven measures of health, pain and arthritis used to explore the experience and impact of pain in arthritis.

Paper 3 used data generated from the *Profile of Pain in Older Women with Arthritis Study* (Paper 2). Paper 3 reports that neuropathic-like pain in arthritis is common and is associated with greater disability and poorer quality of life. Furthermore, women who have arthritis and neuropathic-like pain have significantly more severe pain, a heightened pain experience and more fatigue. Abnormal sensory changes, higher pain catastrophizing and using more medications are significantly associated with neuropathic-like pain.

OARSI and FDA have called for research to define the disease state of arthritis, and this includes the identification and evaluation of different types of pain in arthritis. **Paper 4** identified three subgroups of older, community dwelling women with arthritis with very different, very distinct profiles of pain. Profiles consisted of 39.5% of women having uni-dimensional pain, 38.6% of women having moderate multi-dimensional pain and 21.9% of women having severe multi-dimensional pain. Once profiles were identified, women with moderate and severe multi-dimensional pain profiles were at a significantly greater risk of poorer physical and mental health related quality of life.

This thesis has explored the experience and impact of pain in arthritis. The papers presented provide a significant and important contribution to the field of arthritis and pain, by providing preliminary evidence on the identification and evaluation of different types of pain in arthritis. The next challenge is in the study of the treatment of pain mechanisms in arthritis. This area of research has great promise to improve pain management and decrease the significant socio-economic burden associated with arthritis.