Nurses' knowledge and attitudes regarding pain

April Hylton

A thesis submitted for the degree of Master of Health Sciences (Nursing)
University of Otago
December 2018
ABSTRACT

Background:
Nurses have a crucial role in the assessment and management of pain in the care of the postoperative patient. However, international research has shown significant numbers of nurses surveyed had knowledge and attitudes regarding pain which failed to meet the expected standard. There appears to have been a lack of current evidence on this topic in the New Zealand context. Therefore, this study surveyed the knowledge and attitudes regarding pain, of nurses involved in adult postoperative care.

Aim:
The aim of this study was to explore the knowledge and attitudes of registered nurses (RN’s) regarding pain across five District Health Boards (DHB’s) of the North Island of New Zealand (NZ). The purpose was to establish baseline information in the New Zealand context on RN’s knowledge and attitudes regarding pain, which may inform future strategies to develop pain knowledge and attitudes in this cohort.

Methods:
A cross-sectional descriptive non-experimental design was used to collect data from RN’s involved in adult postoperative care using a modified version of the Knowledge and Attitudes Survey Regarding Pain (KASRP) tool (Ferrell & McCaffery, 2014). Study data were collected via the online KASRP survey, and managed using the Research Electronic Data Capture (REDcap) tool. Demographic data were collected, specifically: Age, gender, years as RN, and years of surgical experience, hours worked per week, DHB employed by, highest nursing qualification, ethnicity, and country of original nurse training. Data were analysed using the Statistical Package for the Social Sciences (SPSS).

Findings:
One hundred and twenty-eight RN’s participated; a response rate of 27.95%. Of these 84 were completed surveys, and 44 incomplete. The averages of nurses’ KASRP scores were 73.1%, with only 41.7% achieving a score over the
recommended score of 80%. The key areas associated with poor RN performance were pharmacological knowledge of opioids, and addiction and abuse. With no correlation found between age, years as an RN, years of surgical experience, hours worked per week, country of original nurse training and scores on the KASRP. RN’s self-evaluation of knowledge and attitudes to pain management demonstrated some nurses underestimated their abilities, while others overestimated.

**Conclusion:**

To this authors’ knowledge, the present study was the first to evaluate knowledge and attitudes of surgical RNs’ regarding pain in New Zealand. This study showed KASRP scores achieved by the participants in the study were consistent with those published over the preceding 20 years of KASRP tool use. Large surveys investigating nurses’ knowledge and attitudes regarding pain have commonly resulted in mean scores below the stated standard.

Consequently methods of modifying knowledge and attitudes regarding pain need to change. Regular ongoing education is required for pre-graduate and postgraduate nurses to deter fears and increase knowledge and attitudes of opioids. Also, an area of deficit is the biopsychosocial approach to pain in the postoperative patient, and therefore could be a beginning point for learning activities.
Dedication
I dedicate this thesis in memory of my parents Pat and Tony Forster, who loved, nurtured and gave me the inspiration to strive and achieve in life.
Acknowledgements

I wish to acknowledge the unfailing support I have received from all of my family and friends throughout this ‘thesis journey’.

Thank you to my work colleague Scott for believing in me and keeping me focussed. Most importantly, a special thank you goes to my husband George, for the continuous encouragement, endless supply of cups of teas, and for taking over the role of chef. Also, my children Amy and Michael, for their patience and understanding of the hours I have spent at my desk. This thesis would not have been possible without you all.
# Table of Contents

ABSTRACT .................................................................................................................. i

Background: ................................................................................................................. i

Aim: ............................................................................................................................... i

Methods: ....................................................................................................................... i

Findings: ....................................................................................................................... i

Conclusion: .................................................................................................................. ii

Dedication .................................................................................................................... iii

Acknowledgements ..................................................................................................... iv

Table of Contents ....................................................................................................... v

Table of Figures .......................................................................................................... xi

Table of Tables ............................................................................................................. xii

Abbreviations ............................................................................................................. xiii

1 Chapter one ............................................................................................................... 1

1.1 Introduction .......................................................................................................... 1

1.1.1 Description of pain ............................................................................................ 1

1.1.2 Physiological response to postoperative pain ............................................... 1

1.1.3 Nociception ....................................................................................................... 2

1.1.4 Physiological effects of postoperative pain ..................................................... 3

1.1.5 Psychological effects of postoperative pain ..................................................... 4

1.1.6 Chronic post-surgical pain ............................................................................. 4

1.1.7 Economic implications of unrelieved pain ....................................................... 5

1.1.8 Ministry of Health statistics .......................................................................... 5

1.1.9 Measurement of nurses’ knowledge and attitudes to pain ............................. 6

1.1.10 Education ........................................................................................................ 6

1.1.11 Nurses attitudes ............................................................................................... 8

1.1.12 Pain assessment ............................................................................................... 8

1.1.13 Influences on nursing interventions ............................................................... 10

1.2 Rationale ............................................................................................................... 11
1.3 Structure of the Thesis........................................................................................................12
1.4 Chapter 1: Introduction....................................................................................................12
1.5 Chapter 2: Background......................................................................................................12
1.6 Chapter 3: Literature review............................................................................................12
1.7 Chapter 4: Methods and methodology............................................................................12
1.8 Chapter 5: Results............................................................................................................13
1.9 Chapter 6: Discussion and conclusion.............................................................................13

2 Chapter two: Background..................................................................................................14
2.1 Introduction......................................................................................................................14
2.2 The Hippocratic corpus .................................................................................................14
2.3 Renee Descartes..............................................................................................................14
2.4 Maximilian Von Frey - Specificity theory........................................................................15
2.5 Goldschneiders – Pattern theory....................................................................................15
2.6 Melzack and Wall – Gate control theory..........................................................................15
2.7 Melzack – Neuromatrix theory.......................................................................................16
2.8 Henry Knowles Beecher – Subjective meaning of pain................................................18
2.9 The biopsychosocial model.............................................................................................18
2.10 Definitions of pain..........................................................................................................19
2.11 The World Health Organisation Analgesic Ladder......................................................19
2.12 Declaration of Montreal (2010)....................................................................................20
2.13 Australian and New Zealand College of Anaesthetists (ANZCA).............................20
2.14 Establishment of Clinical Pain Services.........................................................................20
2.15 Assessment of pain.........................................................................................................21
2.16 Pain as the 5th vital sign...............................................................................................21
2.17 Chapter Summary..........................................................................................................23

3 Chapter three: Literature Review .....................................................................................25
3.1 Introduction......................................................................................................................25
3.2 Marks and Sachar’s (1973) first exploration of knowledge and attitudes to pain.25
3.3 Key figures in the research and development of nurses’ knowledge and attitudes to pain ................................................................. 26
3.4 The last decade ............................................................................. 27
3.5 The development and validation of knowledge and attitudes to pain measurement tools ............................................................................ 28
  3.5.1 Synopsis of the available tools and their contribution ................. 29
  3.5.2 The Knowledge and Attitudes Survey Regarding Pain (KASRP) ........ 29
  3.5.3 The Pain Knowledge Questionnaire (PKQ) ............................... 31
  3.5.4 The Clinical Decision-Making Questionnaire for Pain Management (CDMQP) ................................................................. 32
  3.5.5 The Brockopp and Warden Pain Knowledge/Bias Questionnaire (BWPKBQ) .................................................................. 33
3.6 Foundations of knowledge ................................................................. 34
  3.6.1 Personal and professional knowledge ......................................... 35
  3.6.2 The shaping of attitudes ............................................................... 37
  3.6.3 Te Kaunihera Tapuhi o Aotearoa/The Nursing Council of New Zealand .... 38
  3.6.4 Te Tiriti o Waitangi/The Treaty of Waitangi ................................ 38
  3.6.5 Professional attitudes ................................................................. 39
  3.6.6 Knowledge of pharmacology .................................................. 40
3.7 Influence of education on nurses knowledge and attitudes ................. 43
  3.7.1 Higher education ................................................................... 43
  3.7.2 Effects of educational interventions .......................................... 44
3.8 Nurses self-rating of pain knowledge ............................................. 49
3.9 Personal values .............................................................................. 49
3.10 Nurses’ assessment of patients’ pain based on patient behaviours .......... 50
  3.10.1 Nurses decisions regarding treatment choice/analgesic dose .......... 52
3.11 Predictors of nurses’ knowledge and attitudes .................................. 53
3.12 The impact and influence the nurse’s knowledge and attitudes to pain has on the patient’s care, outcomes, experience and recovery ........................................ 55
3.13 Chapter summary ....................................................................... 57
Chapter four: Methodology and Methods

4.1 Introduction

4.2 Aim of the study

4.3 Purpose

4.4 Methodology

4.4.1 Quantitative method

4.4.2 Descriptive design

4.4.3 Instrument Selection

4.4.4 Instrument Modification

4.5 Setting

4.6 Sample

4.6.1 Study Participants

4.6.2 Recruitment

4.6.3 Inclusion and Exclusion criteria

4.6.4 Power Analysis

4.7 Data collection

4.7.1 Data Analysis and processing

4.8 Ethical Considerations

4.8.1 Consent

4.8.2 Cultural/Māori Considerations

4.8.3 Scope and Limitations

4.9 Chapter Summary

Chapter five: Results

5.1 Introduction

5.1.1 Total scores achieved on KASRP

5.1.2 Response rate

5.1.3 Total scores achieved on KASRP
5.1.4 Responses and DHB numbers ................................................................. 83
5.1.5 Gender of Participants ........................................................................ 84
5.1.6 Ages of participants ........................................................................... 85
5.1.7 Years as a Registered Nurse ............................................................... 86
5.1.8 Years of surgical experience as a Registered Nurse ......................... 88
5.1.9 Hours worked per week ...................................................................... 89
5.1.10 Highest Qualification ......................................................................... 90
5.1.11 Demographic Ethnicity ...................................................................... 91
5.1.12 Country of original nurse training ..................................................... 92
5.1.13 Self- evaluation of level of knowledge regarding pain management .... 93
5.1.14 Comparison of responses to patient clinical vignette questions 38, 39, 40 and 41 ................................................................. 95

5.2 Chapter summary .................................................................................... 97

6 Chapter six: Discussion and Conclusion .................................................. 98
6.1 Introduction ............................................................................................. 98
6.1.1 Country of original nurse training ..................................................... 98
6.1.2 Participants Ethnicity .......................................................................... 99
6.1.3 Ages of participants ........................................................................... 99
6.1.4 Years as a Registered Nurse and surgical experience ....................... 100
6.1.5 Self-evaluation of knowledge regarding pain management .............. 102
6.1.6 Hours worked per week .................................................................... 104
6.1.7 The culture of the department ........................................................... 104
6.1.8 Pharmacological knowledge of morphine ....................................... 106
6.1.9 Pain management in cancer care ...................................................... 107
6.1.10 Assessment of pain/patient case vignettes on the KASRP ............... 108
6.1.11 Comparison of the two patient case vignettes on the KASRP .......... 109
6.1.12 Clinical decisions regarding analgesia: patient case vignettes on the KASRP ................................................................. 110
6.1.13 Fear of use of opioids ..................................................................... 112
6.1.14 Education ....................................................................................... 114
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1.15</td>
<td>Pain assessment</td>
<td>116</td>
</tr>
<tr>
<td>6.1.16</td>
<td>The progress of understanding nurses attitudes to pain management</td>
<td>117</td>
</tr>
<tr>
<td>6.2</td>
<td>Conclusion</td>
<td>117</td>
</tr>
<tr>
<td>6.3</td>
<td>Recommendations</td>
<td>120</td>
</tr>
<tr>
<td>6.4</td>
<td>Limitations</td>
<td>120</td>
</tr>
<tr>
<td>6.5</td>
<td>Summary</td>
<td>122</td>
</tr>
<tr>
<td>7</td>
<td>References</td>
<td>124</td>
</tr>
<tr>
<td>8</td>
<td>Appendices</td>
<td>139</td>
</tr>
<tr>
<td>8.1</td>
<td>Appendix 1</td>
<td>139</td>
</tr>
<tr>
<td>8.2</td>
<td>Appendix 2</td>
<td>147</td>
</tr>
<tr>
<td>8.3</td>
<td>Appendix 3 Participant Information sheet</td>
<td>149</td>
</tr>
<tr>
<td>8.4</td>
<td>Appendix 4 Consent Information for Participants</td>
<td>152</td>
</tr>
<tr>
<td>8.5</td>
<td>Appendix 5</td>
<td>154</td>
</tr>
<tr>
<td>8.6</td>
<td>Appendix 6</td>
<td>156</td>
</tr>
<tr>
<td>8.7</td>
<td>Appendix 7</td>
<td>157</td>
</tr>
<tr>
<td>8.8</td>
<td>Appendix 8</td>
<td>159</td>
</tr>
</tbody>
</table>
Table of Figures

Figure 1 Total KASRP scores and age ................................................................. 86
Figure 2 Total KASRP scores and years as Registered Nurse .................................. 87
Figure 3 Total KASRP scores and years of surgical experience .................................... 90
Figure 4 Total KASRP scores and hours worked per week ........................................... 91
Figure 5 Total percentage of KASRP scores achieved by highest qualification .............. 92
Figure 6 Total KASRP scores by country of original nurse training .............................. 94
Figure 7 Total percentage of KASRP scores by self-evaluation of level of knowledge ........ 96
Table of Tables

Table 1 Demographic data ................................................................. 78
Table 2 Total scores achieved on KASRP ........................................... 79
Table 3 Responses/DHB’s ................................................................. 84
Table 4 Gender .............................................................................. 84
Table 5 Age groups ....................................................................... 85
Table 6 Number of years as a Registered Nurse .............................. 87
Table 7 Number of years of surgical experience as a Registered Nurse 88
Table 8 Highest qualification .......................................................... 90
Table 9 Country of original nurse training ...................................... 92
Table 10 Participants self-evaluation of knowledge regarding pain management 94
Table 11 (Q38) Andrew talking joking pain score ............................. 96
Table 12 (Q39) What action do you take regarding Andrew's pain .......... 96
Table 13 (Q40) Robert grimacing pain score .................................... 96
Table 14 (Q41) What action do you take regarding Robert's pain ........ 96
**Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANZCA</td>
<td>Australian and New Zealand College of Anaesthetists</td>
</tr>
<tr>
<td>APS</td>
<td>American Pain Society</td>
</tr>
<tr>
<td>BWPKBQ</td>
<td>Brockopp and Warden pain knowledge/bias questionnaire</td>
</tr>
<tr>
<td>CDMQP</td>
<td>Clinical decision-making questionnaire for pain management</td>
</tr>
<tr>
<td>CPS</td>
<td>Clinical Pain Service</td>
</tr>
<tr>
<td>DHB</td>
<td>District Health Board</td>
</tr>
<tr>
<td>DVT</td>
<td>Deep vein thrombosis</td>
</tr>
<tr>
<td>ED</td>
<td>Emergency department</td>
</tr>
<tr>
<td>FPS-R</td>
<td>Faces pain scale – revised</td>
</tr>
<tr>
<td>FTE</td>
<td>Full time equivalent</td>
</tr>
<tr>
<td>HDU</td>
<td>High Dependency Unit</td>
</tr>
<tr>
<td>HCAHPS</td>
<td>Hospital Consumer Assessment of Health Care Providers and systems</td>
</tr>
<tr>
<td>IASP</td>
<td>International Association for the Study of Pain</td>
</tr>
<tr>
<td>ICU</td>
<td>Intensive Care Unit</td>
</tr>
<tr>
<td>KASRP</td>
<td>Knowledge and attitudes survey regarding pain</td>
</tr>
<tr>
<td>MI</td>
<td>Myocardial infarction</td>
</tr>
<tr>
<td>MOH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>NCNZ</td>
<td>Nursing Council of New Zealand</td>
</tr>
<tr>
<td>NRS</td>
<td>Numerical rating scale</td>
</tr>
<tr>
<td>OW</td>
<td>Ordinary ward</td>
</tr>
<tr>
<td>PACU</td>
<td>Post-Anaesthetic Care Unit</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>PCA</td>
<td>Patient controlled analgesia</td>
</tr>
<tr>
<td>PE</td>
<td>Pulmonary embolism</td>
</tr>
<tr>
<td>REDcap</td>
<td>Research electronic data capture</td>
</tr>
<tr>
<td>RN</td>
<td>Registered Nurse</td>
</tr>
<tr>
<td>SCN</td>
<td>Specialist Clinical Nurse</td>
</tr>
<tr>
<td>SICU</td>
<td>Sub-intensive Care Unit</td>
</tr>
<tr>
<td>USA</td>
<td>United States of America</td>
</tr>
<tr>
<td>VAS</td>
<td>Visual analogue scale</td>
</tr>
<tr>
<td>VRS</td>
<td>Verbal rating scale</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
</tr>
</tbody>
</table>
1 Chapter one

1.1 Introduction

1.1.1 Description of pain

Pain is described as “An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (International Association for the Study of Pain, 2018d). Pain is a personal experience, manifest in a personal manner. With individual variability which only becomes evident to the nurse by communication of the subjective experience, expression and behaviour of the patient who is experiencing the pain (Coghill, 2010).

Nurses have a crucial role in the assessment and management of pain in the care of the postoperative patient (Craig, Otani, and Herrmann, 2015) and unrelieved postoperative pain can put the patient at risk of postoperative complications (Kahn et al., 2014; Ljungqvist, Thanh, & Nelson, 2017). Unnecessary suffering can result in patient dissatisfaction with care (Bozimowski, 2012). Conversely, increased satisfaction has been reported by patients if they felt their pain concerns were acknowledged by the nurse (Bozimowski, 2012).

With growing knowledge of genetics and the identification of genetic variants related to pain, the study of pain now also incorporates research in epidemiology and medical genetics as well as sociological and cultural studies (Bennett & Woods, 2014; Mogil, 2012). The wide inter-individual variability associated with analgesic therapeutic and adverse effects has been better understood through genetic investigations (Trescot, 2014). This has the potential to have a positive impact for the patient as those patient’s with a personal or family history of sensitivity or lack of efficacy of medications, such as opioids, may be able to receive a personalised approach to their pain management (Sadhasivam et al., 2014; Trescot, 2014).

1.1.2 Physiological response to postoperative pain

Pain after surgery, or postoperative pain, is a widely anticipated consequence of surgery due to the inherent tissue damage that occurs during the surgical procedure.
This acute postoperative pain is associated with potential and actual tissue damage, and triggers a physiological response known as ‘the injury response’ (Schug, 2015). The injury response is associated with the patient’s autonomic, neuroendocrine-metabolic, and physiological responses, which can have detrimental effects for the patient and their postoperative recovery. This postoperative injury response drives nociceptive firing and thus pain intensity.

1.1.3 Nociception

The body's somatosensory system has the function of detecting noxious and potentially damaging stimuli, such as the injury response post-surgery. This is known as nociception, and is the term given to the process of the nervous system transmission of information from the tissues to the brain. The response is communicated to the peripheral and central nervous system, with specific receptors known as nociceptors present in the skin, muscle, skeletal structures and viscera. These receptors are activated by chemical substances including prostaglandin, bradykinin, serotonin, substance P, potassium and histamine (Argoff, Dubin, & Pilitsis, 2018).

Pain is the brain’s higher centres experience of nociceptive data; being individual, complex and subjective. It can be affected by many factors including the sensory, emotional and cognitive experience e.g. distraction, mood, beliefs and genetics. With the ever growing knowledge of pain, imaging techniques, such as functional magnetic resonance imaging (MRI) have demonstrated multiple networks are activated during the acute pain experience and neuroimaging research has identified multiple brain regions involved in the processes of pain, sensory, motor, cognitive, motivational, memory emotion and fear that are related to acute pain (Martucci & Mackey, 2016). Numerous factors have been found to influence the experience of pain, and neuroimaging continues to investigate the impact of pain perception by studying related changes in brain activity. However the relationship between images and pain experience remain uncertain (Martucci & Mackey, 2016).
1.1.4 Physiological effects of postoperative pain

The postoperative injury response drives nociceptive firing and thus pain intensity. The sympathetic and parasympathetic nervous systems are activated and can affect various body systems. The patients’ cardiovascular system may be activated with resulting effects which can include increased heart rate, reduced oxygen supply to the heart’s myocardium, and consequently a risk of cardiac ischaemia, particularly if the patient has pre-existing cardiac disease (Schug, 2015).

Endocrine-metabolic changes can be induced which include an increase in catabolic hormones such as cortisol, catecholamine’s, glucagon, and a decrease in anabolic hormones, testosterone and insulin. The clinical consequences for the patient can include impaired wound healing, loss of muscle mass, and risk of postoperative ileus. The incidence of postoperative ileus, with reduced gastric and bowel motility, can delay the patient’s ability to commence oral nutrition, and consequently delayed healing (Barbieux et al., 2017).

Early postoperative mobilisation is essential for the patient to be able to participate in postoperative rehabilitation, and this can only be made possible by the patient receiving adequate pain relief. If the patient is unable to mobilise they are at risk of decreased regional blood flow causing a risk of deep vein thrombosis (DVT), pulmonary embolism (PE), and myocardial infarction (MI) (Khan et al., 2014; Ljungqvist, Thanh, & Nelson, 2017).

Additionally, the patients’ respiratory system can be compromised if the patient has unrelieved postoperative pain. The patient may then be reluctant to, or have reduced ability to, cough or carry out deep breathing exercises. These are essential in reducing postoperative pulmonary complications such as sputum retention, atelectasis, infection and pneumonia (Schug, 2015; Silva, Li, & Rickard, 2013). The effect of unrelieved postoperative pain on the patients’ musculoskeletal system may lead to the patient experiencing muscle spasms, and reduced respiratory effort known as splinting. Also, prolonged bed rest due to pain, can cause muscle wasting leading to prolonged recovery of function (Wall et al., 2014).
1.1.5 Psychological effects of postoperative pain

In addition to the significant negative physiological effects, inadequate pain management can be detrimental to the patient psychologically. Pain is not a directly observable or measurable phenomenon but rather a subjective experience that has a variable relationship with actual tissue damage.

The experience of unrelieved pain can cause obvious unnecessary suffering and dissatisfaction for the patient and their family (Hanna, Gonzalez-Fernandez, Barrett, Williams, & Pronovost, 2012). The patient may experience sleep deprivation which can increase postoperative fatigue. This may result in not only reluctance to mobilise, but also psychological issues which may include stress, anxiety, insomnia, fatigue, feeling of demoralisation, dissatisfaction with care, and depression (Schug, 2015).

Research exploring patient satisfaction with post-operative care indicated key influences associated with nurse demeanour and communication. Patients reported dissatisfaction with their pain management, and felt nurse’s did not do everything they could to alleviate their pain (Hanna et al., 2012). Whereas, patients have reported satisfaction if they felt their pain concerns were listened to by the nurse (Bozimowski, 2012).

1.1.6 Chronic post-surgical pain

The presence of severe postoperative pain can have long term psychological effects for the patient, and is regarded as a risk factor and predictor for the patient developing intractable chronic post-surgical pain related to central sensitization (Schug, 2015). The consequences of this have been demonstrated to negatively impact the patients’ quality of life, their ability to work and also their long term mental health (Chapman & Vierck, 2017; Lavand’homme, 2011; Steyaert & De Kock, 2012).

The nurse has a significant role in the patients’ postoperative pain management, and there has been a suggested link between nurses knowledge and attitudes and patients receiving inadequate pain management (Eriksson, Wikström, Fridlund, Årestedt, & Broström, 2016; Pretorius, Searle, & Marshall, 2015; Zoëga et al., 2015). Ultimately
this has been reported to have an impact on patient outcomes, as stated above. If postoperative pain is not adequately managed, the consequences can be significant for the patient.

1.1.7 Economic implications of unrelieved pain

As well as the possible detrimental effects on the patient, there can be economic and medical implications for healthcare systems associated with the complications from inadequately managed postoperative pain. Extended length of stay has been associated with inadequately managed post-operative pain and associated secondary consequences. In addition readmission costs could be a factor if the patient experiences ongoing issues with inadequate pain relief (Auyong et al., 2015; Barbieux et al., 2017; Hansen et al., 2017; Scarci, Solli, & Bedetti, 2016).

Sibia, Mandelblatt, Callanan, MacDonald, and King (2017) demonstrated patients who ambulated on the day of their orthopaedic surgery tended toward a lower risk for readmission to hospital after their discharge (Sibia et al., 2017). Early mobilisation following post hip or knee joint surgery showed to reduce the length of the patients’ hospital stay (Guerra, Singh, & Taylor, 2015). Improved postoperative pain management has been associated with less resource use, decrease in hospital costs and improved discharge status (Auyong et al., 2015; Barbieux et al., 2017; Hansen et al., 2017; Scarci et al., 2016).

1.1.8 Ministry of Health statistics

The Ministry of Health statistics from July 2017 to June 2018 show there were approximately 333,776 patients who received treatment within the surgical specialities in New Zealand (Ministry of Health, 2018b). Surgical specialities are categorised by the Ministry of Health (2018b) as patients who have passed through the surgical services, however, it does not necessarily mean the patient has undergone surgery. Equally these statistics do not include data for patients who have undergone a procedure on an outpatient basis, an investigative procedure, or a procedure in the Emergency Department (ED). In the five District Health Boards (DHB’s) of the North Island of New Zealand, which this author has surveyed, there
were approximately 68,841 patients who received surgical treatment from July 2017 to June 2018 (Ministry of Health, 2018b).

International results reported by Carr et al. (2014) and Manias (2015), demonstrated around 40% of hospital patients reported moderate and severe pain, with 50% of those patients being surgical patients. When comparing these percentages to the number of patients who receive treatment within the surgical specialities in New Zealand, the prevalence of patients who may experience persistent pain may be a significant problem with poor postsurgical management. In an attempt to improve outcomes for patients, international researchers over the years have investigated nurses’ knowledge and attitudes to pain management.

1.1.9 Measurement of nurses’ knowledge and attitudes to pain

Researchers have explored nurses’ knowledge and attitudes with the use of various tools including the Knowledge and Attitudes Survey Regarding Pain (KASRP), the pain knowledge questionnaire (PKQ), the clinical decision-making questionnaire for pain management (CDMPQ) and the Brockopp and Warden Pain knowledge/bias questionnaire (BWPKBQ).

1.1.10 Education

Various topics have been examined around nurses’ knowledge and attitudes to pain, with numerous conclusions. Education has been investigated with correlation studies, both undergraduate (Mackintosh-Franklin, 2017), pre and post education programmes (Jarrett, Church, Fancher-Gonzalez, Shackelford, & Lofton, 2013; McNamara, Harmon, & Saunders, 2012; Schreiber et al., 2014) and also levels of nurses education (Gretarsdottir, Zoega, Tomasson, Sveinsdottir, & Gunnarsdottir, 2017; Vickers, Wright, & Staines, 2014). Seventy one undergraduate nursing programmes in the UK were reviewed by Mackintosh-Franklin (2017), and it was established that only 8.5% of the programmes featured pain in their aims and outcomes. This begins to give an indication of the possible lack of pain knowledge the undergraduate nurse will have as he/she embarks on their career towards graduating as a Registered Nurse (RN).
Pre and post education programme testing has been performed amongst RN’s to monitor short term and long term impact of pain educational programmes. These studies have achieved mixed results. Education aimed at enhancing pain knowledge and attitudes were determined to be most effective immediately after an education session compared with medium or long term (McNamara et al., 2012). While Schreiber et al. (2014) reported no statistical difference on knowledge scores between pre and post education. Yet, Jarrett et al. (2013) determined nurses’ knowledge and attitudes remained higher six months after an educational programme. Whereas, education has shown to have a positive effect on nursing pain assessment, however, the researchers, Drake and De Williams (2017) highlighted the lack of capturing the social nature of pain assessment in education.

Higher levels of education were shown by some researchers to have an association with nurses’ higher scores on knowledge and attitudes to pain testing as evidenced by Moceri and Drevdahl (2014); Yava et al. (2013), Gretarsdottir et al. (2017), and Brant, Mohr, Coombs, Finn, and Wilmarth (2017). Moceri and Drevdahl (2014) stated that questions about opioid pharmacology and dosage demonstrated significant differences for education level ($df = 3$, $F = 4.528$, $p = .005$), and also significant differences for education level for knowledge of drug addiction/dependency ($df = 3$, $F = 8.836$, $p = .005$). Yava et al. (2013) claimed nurses with an educational level of Master’s degree or higher, and those with baccalaureate training had a statistically higher knowledge score than nurses with an associate degree ($p = .001$). In Gretarsdottir et al. (2017) study, participants with an advanced degree in nursing had on average 2.9 points higher scores (95% confidence interval [CI]: 0.9–4.7) compared to those without an advanced degree. Brant et al. (2017) also stated that BSN and Diploma nurses scored higher than associate degree nurses. Whereas, Latina et al. (2015) reported no meaningful differences observable between attitude and level of education: (Pearson chi-square $= 0.245$, $p = 0.887$), or knowledge and level of education: (Pearson chi-square $= 1.5360$, $p = 0.464$).

Nurses’ pharmacological knowledge has also been addressed, with deficits in nurses’ pharmacological knowledge generating much scrutiny. In their surveys Vickers et al (2014), and Moceri and Drevdahl (2014) reported widespread
knowledge deficits for nurses, with regard to pharmacological knowledge. Again in a 2017 survey, Brant et al reported the most commonly missed questions by nurses were related to dosage of analgesia, side effects, over sedation and drug interactions. These results were also shown by Gretarsdottir et al in their 2017 survey, with the lowest number of correct answers attained by nurses related to pharmacology, dosage, route, administration, drug interactions, mechanism of action and side effects.

1.1.11 Nurses attitudes

Despite increasing pain management education, it has been hypothesized that the disconnect between pain management education and clinically competent pain management, evidenced by reports of poorly managed pain for patients, were due to the personal values the nurse brings to the education classes (Bernhofer, Hosler, & Karius, 2016). Personal values such as ethical ideals, moral stances, prejudice, beliefs, personal perspective, and experience, have been shown to be projected onto professional attitudes and transferred to the clinical setting (Bernhofer, Hosler, & Karius, 2016).

In their systematic review of forty two peer-reviewed articles, Fitzgerald and Hurst (2017) found implicit bias was demonstrated by care professionals in thirty five of the articles. These biases included race/ethnicity, gender, socio-economic status, mental illness, weight, having AIDS, brain injured patients perceived to have contributed to their injury, intravenous drug users, disability, social circumstances and age (Fitzgerald and Hurst, 2017). The level of bias were all correlated with socio-demographic characteristics of the physicians and nurses e.g. gender, race, type of healthcare setting, years of experience, and country where the medical training was received (Fitzgerald and Hurst, 2017).

1.1.12 Pain assessment

The key influences and experiences that build pain knowledge and associated attitudes in the nursing workforce have been explored and there have been many examples of influence that may impact the nurses’ clinical decision making. These influences can be transferred to the nurses’ assessment of the patients’ pain.
The patient’s pain experience is a subjective one (Coghill, 2010), and pain assessment is based on the patients’ self-report of their pain experience (McCaffery, 1968). However, nurses have been shown to make pain management decisions based on objective indicators such as patients’ vital signs and the patients’ ability to sleep (Kiekkas et al., 2015). The nurse’s perception of the patient’s pain experience has been influenced by the nurse’s own personal judgements (McNamara et al., 2012). Nurses have been shown to believe patients overestimate their pain (Latina et al., 2015), and consequently have planned the patients’ pain management based on their own judgements rather than the patients’ report of pain (Carr et al., 2014; Pierik, Ijzerman, Gaakeer, Vollenbroek-Hutten, & Doggen, 2017).

In the findings of their study, Schreiber et al. (2014) put forward that nurses showed bias towards patients with non-physiological conditions, including drug abusers, suicide attempters, frequently re-admitted patients and confused elderly. In other studies Vickers et al. (2014), Brant et al. (2017); Moceri and Drevdahl (2014) concluded nurses were more likely to respond to the patient showing overt non-verbal expressions of pain. This indicates that the demeanour and characteristics of the patient had a direct influence on the nurses’ assessment of their pain (Bach, Forman, & Seibaek, 2018). Additionally, patients’ pain was under-assessed in patients with lower educational level; who smoked; were anxious; or who used pre-hospital admission analgesia (Pierik et al., 2017).

Vaismoradi, Skar, Soderberg, and Bondas (2016) put forward that nurses’ own personal experiences influenced their decision making when assessing the patient’s pain, which included either the nurse’s own experience of pain or through observations of other patients’ pain. Vaismoradi et al. (2016) also argued that the nurse then developed an internal reference that they believed was associated with certain situations, tissue changes, or by the procedure the patient had undergone. If the patient did not behave in line with the nurses’ expectations, then the nurse may question the authenticity of the patients self-report of pain as being sincere or not (Mackintosh-Franklin, 2014b; Pretorius et al., 2015). This demonstrated a mechanistic view of the nature of pain, with a fixed attitude, which did not incorporate the psychological or social aspects of the patients’ pain.
Personal experiences could also include the nurse own cultural background and beliefs. These cultural beliefs could influence the nurses’ perceptions about pain as well as how the nurse perceived the patients should manage their pain (Ho & Johnson, 2013). Additionally, the culture of the patient could have an influence on how they portray their pain and on the way the nurse assesses the patients pain (Tait & Chibnall, 2014).

Nursing role models, such as senior nurses and other nursing colleagues with more nursing experience, could also influence the nurse’s behaviour and consequently these behaviours can be imitated (Feltrin, Newton, & Willetts, 2018; Moule, 2018). This could have a positive or negative effect on the nurses’ pain assessment, and consequently on the outcome for the patients’ pain management, depending on the behaviour being imitated.

Vickers et al. (2014) suggested a lack of insight of nurses into their own levels of knowledge and possible poor attitudes may have had negative consequences for the patient (Vickers et al., 2014). If the nurse was unaware of these deficits then they would not have the motivation to instigate any personal changes. As Pretorius et al. (2015) showed, nurses had incorrect and inadequate knowledge regarding drug addiction habits, which could have impacted on the assessment of the patient presenting with pain and a comorbidity of drug addiction. Nurses have been reported as identifying pain as ‘normal’, particularly in the postoperative setting (Mackintosh-Franklin, 2014b). This attitude had the potential for the patients’ pain to remain undertreated.

1.1.13 Influences on nursing interventions

There have been various reasons cited for patients not having their pain adequately assessed and managed. High workloads, time pressure, distractions and interruptions have all been cited as having an impact on the nurses’ ability to manage patients’ pain (Eriksson et al., 2016). Nurses have reported that patients were reluctant to report their pain. Patients have also contributed to this assertion, with factors that included a fear of bothering the nursing staff when they were busy, and patients fear of being viewed as being a nuisance if they requested analgesia (Eriksson et al., 2016). A reluctance of patients to take opioids has also been cited as a barrier to
effective pain management for patients (Dequeker, Van Loncker, & Van Hecke, 2018; Pretorius et al., 2015), with a high proportion of patients having the incorrect belief that people can become addicted to pain medication very easily (Cogan et al., 2014). Patients have also cited their own lack of knowledge which made them unable to determine how much pain they could tolerate (Eriksson et al., 2016).

Organisational features of the healthcare facility have also contributed to patients’ pain being under-assessed and under-managed. Nurses have been limited in their administration of adequate analgesia due to inadequate or under-prescribing, the availability of a medication prescription, and doctors have had reluctance to prescribe analgesia (Pretorius et al., 2015). This had the potential to lead to a delay in the administration of analgesia and consequently prolonged pain for the patient. Even when appropriate opioids have been prescribed, the policies and protocols instigated to guide safe practice for the administration of intravenous morphine have been cited as a barrier for nurses to adequately manage patients’ pain. The need for frequent monitoring post administration of intravenous opioids has been reported as time consuming for the nurse, and to add pressure to the nurses’ already heavy workload (Pretorius et al., 2015).

1.2 Rationale

The rationale for this study developed from this author’s role as a Specialist Clinical Nurse (SCN) for the Clinical Pain Service of a hospital in the Bay of Plenty, NZ. The role of the SCN is a pivotal one within the Clinical Pain Service, liaising with the bedside RN’s caring for the patients with acute postoperative pain, and also educating RN’s on acute pain topics, data collection and quality improvement measures. The SCN facilitates a bidirectional dialog between ward nurses and the rest of the Clinical Pain Service Team, which includes the nursing Team Leader, the Duty Anaesthetic Registrar and the Consultant Anaesthetist. The SCN also facilitates communication with all other health care professionals whose interactions with the patient are affected by acute pain. The familiarity with nursing practices also assists the SCN in their role as educators of patients and other nurses. In this authors day to day work several questions arose as to the prevalence of inadequate postoperative pain management, and whether it is due to nurses’ knowledge and
attitudes, and if so, do we need to see how these knowledge and attitudes can be addressed to ensure better postoperative outcomes for the patients. This study was the first in New Zealand to measure knowledge and attitudes of Registered Nurses regarding pain. It was anticipated that the findings from this study would provide a benchmark for nurse knowledge and attitudes regarding pain in New Zealand.

1.3 Structure of the Thesis

The thesis is presented in six chapters.

1.4 Chapter 1: Introduction

Chapter one provides an introduction to the thesis and includes the aims and rationale for the study.

1.5 Chapter 2: Background

Chapter two presents the background to the study, with an overview of the history of pain.

1.6 Chapter 3: Literature review

Chapter three presents a review of the extensive literature relating to nurses’ knowledge and attitudes to pain in the international context. With minimal literature in New Zealand, this chapter discusses the literature available.

1.7 Chapter 4: Methods and methodology

The details of the study design are presented in chapter four, with the aim and purpose for selection of the same. A background to the choice of methodology is presented and the rationale for the sampling and recruitment strategies employed. Instrument selection and modification are discussed, and the collection and analysis of data. Also discussed are the ethical principles that guided the study and methodological rigour.
1.8 Chapter 5: Results

The findings which emerged from the study are presented in this chapter. Data were analysed using the Statistical Package for the Social Sciences (SPSS) data analysis package. Results of the KASRP surveys were analysed by calculating overall scores for the entire sample and for each DHB. Descriptive statistics were used to analyse the demographic variables.

1.9 Chapter 6: Discussion and conclusion

This chapter discusses the findings of the research, and implications of the findings for clinical practice. The final section summarises the work presented, discusses limitations of the study and presents recommendations for future consideration.
2 Chapter two: Background

2.1 Introduction
The background chapter presents the review of the evolution of knowledge and attitudes regarding pain since the early writings of Greek physicians, and the Hippocratic corpus, from the sixth - fourth centuries BC to the present day. Over these many centuries substantial understanding has been gained in important aspects of the physiology and pathophysiology of pain, and complex pharmacological and non-pharmacological pain management. A brief history will be presented of the progression in the understanding of the physiology of pain and the development of pain theory to the modern understanding of the neurophysiology of pain.

2.2 The Hippocratic corpus
The evolution of knowledge and attitudes regarding pain has been substantially influenced by important physicians and philosophers over many centuries. The Hippocratic corpus presented detailed observations and important novel theories of pain, the foundation of which was the assertion that the cause of such physical phenomena was knowable and could be understood in terms of natural rather than supernatural causes (Iniesta, 2011). Furthermore, these writings emphasised clinician duty in the mitigation of patient pain and suffering.

Knowledge and attitudes to pain have progressed significantly over the intervening centuries with some important milestones, occasions where the pain paradigm underwent important development and change. The historical progression in the understanding of the physiology of pain has been signposted by several important theory propositions; that of specificity, intensity, pattern, gate control and neuromatrix.

2.3 Renee Descartes
Renee Descartes (1596-1650) developed a detailed theory of pain signals in which he described pain as a perception that existed in the brain making the distinction between the neural phenomenon and sensory transduction and the perceptual experience of pain. What was crucial to the development of Descartes theory was his
description of nerves, perceived as hollow tubules, which carry both sensory and motor information to the brain (Moayedi & Davis, 2013).

2.4 Maximilian Von Frey - Specificity theory
Following Descartes findings, the Specificity theory was one of the first modern theories of pain. In the late nineteenth century Maximilian Von Frey (1855 – 1932) claimed pain was an independent sensation with specialised peripheral sensory receptors (later described as nociceptors), which responded to stimulation and sent signals through pathways (along nerve fibres) in the nervous system to target centres in the brain. The theory further proposed that the brain centres then processed the signals to produce the experience of pain. The difference between these subcutaneous receptors was that they varied with their functionality, and interpreted various sensations such as touch, heat, cold pressure or pain (Moayedi & Davis, 2013).

2.5 Goldschneiders – Pattern theory
Goldschneiders (1858 – 1935) contributed to the discourse on pain physiology with the proposal of the Pattern theory of pain in which the unique patterns of stimulation at the nerve endings were what distinguished the flexibility in the interpretation of the sensory signals. It was theorised that the central nervous system was responsible for coding the nerve impulse patterns that resulted in the pain experience and the brain as having no control over the perception of pain. This theory did not recognise specialised receptors for pain and viewed the brain more as a message recipient. Nonetheless, the pattern theory helped to explain phantom limb pain which was as the experience of pain after the input from the nerves have been terminated (Moayedi & Davis, 2013).

2.6 Melzack and Wall – Gate control theory
Current pain theory has been largely based on the gate control theory published in 1965 by Melzack and Wall. This highly influential theory provided a mechanism to explain how the encoding system, the brain and spinal cord, could change its input-output in a bidirectional manner (Melzack & Wall, 1965; Wright, 2015). Melzack and Wall’s gate control theory revolutionised the field of pain study and led to an understanding of how the brain filters, selects and modulates signals (Melzack &
Stimulation of nociceptors produces impulses in peripheral nerves that enter the dorsal column of the spinal cord. The concept of the pain ‘gate’ was that the substantia gelatinosa in the dorsal horn acted as a gate control mechanism. The sensory information arrives in both large and small afferent fibres. Immediate, sharp pain is transmitted by large myelinated A fibres, and slow, diffuse, or aching pain is transmitted by small unmyelinated C fibres. The balance of activity in different afferent fibres may stimulate or inhibit the next cells in the dorsal horn and so ‘open or close’ the gate for transmission of impulses higher up in the nervous system. ‘Closing the gate’ was thought to stop the nociceptive signals and therefore the patient would not experience the pain, and ‘opening the gate’ would therefore cause the patient to experience the nociceptive signals (Bonica & Loeser, 2010; Melzack & Wall, 1965).

Prior to the introduction of the gate control theory psychological factors in a patient’s life were not considered as being relevant to their pain experience. The introduction of the gate control theory provoked significant academic and clinical discourse and drew the patient experience into focus. It included psychological factors such as thoughts, beliefs and emotions as factors of influence on the subjective pain experience (Bonica & Loeser, 2010).

Even though the underlying mechanisms of the gate control theory have since been debated, the assertion that there was interaction between the psychosocial and physiological processes gained wide acceptance in pain management. As a consequence of this there was a considerable increase in pain research and new therapeutic approaches.

### 2.7 Melzack – Neuromatrix theory

Pain theory was further developed by Melzack and colleagues with the introduction in 1989 of the Neuromatrix theory of plasticity (Melzack, 2005). This work was motivated by the need to foster research into neural mechanisms of the unusual and very different sensations of phantom pain that patients experienced. The sensory experience was thought to create a unique neuromatrix, which was imprinted on the brain. When the limb was amputated, the neuromatrix tried to then reorganise but the neurosignature remained due to the pain experienced before the amputation. This
resulted in phantom limb pain after amputation (Melzack, 2005). The concept of the neuromatrix of pain and neuroplasticity is the ability of the nervous system to change its structure and function. The model of the neuromatrix is that the central nervous system (brain and spinal cord) work together in response to stimuli from the body or the environment to create the experience of pain.

This current understanding of neurophysiology superseded earlier theories which concentrated only on the pathophysiological component of pain. Instead, the gate control and neuromatrix theories provided an understanding of the mind-body relationship to the pain experience, and the biopsychosocial perspective on pain has become the most realistic approach towards understanding the concept of pain (Argoff et al., 2018). This approach views a physical disorder as the result of a complex interaction among biological, psychological and social factors that can often affect the pain experience. The patient’s expression of their pain experience can vary due to the range and interaction of these factors that regulate the interpretations of the symptoms (Argoff et al., 2018).

Based on this neuromatrix theory, individuals were understood to have a unique neuromatrix which is comprised from genetics, sensory modalities and memory, and determines the overall interpretation of the patient’s experience of pain. This knowledge has broadened the study of pain to incorporate research in epidemiology and medical genetics as well as sociological and cultural studies (Melzack, 2008). Throughout a person’s lifespan, changes can occur in the brain due to individual pain experience. This is known as neuroplasticity whereby the brain can reorganise itself which can result in changes over time and has the implications in both the establishment of chronic pain and its management (Cousins & Gallagher, 2017). Understanding the influence the patients’ unique neuromatrix would have on the patient’s pain experience is an important factor when addressing the nurse’s knowledge and attitudes to pain.

Current knowledge of pain is underpinned by the integrated pain theory and research evidence. In addition to the development of knowledge regarding pain physiology the integration of pain theories; specificity, intensity, pattern, gate control and neuromatrix, influenced changes in clinician and patient attitudes associated with
pain and the development of evidence informed clinical approaches to pain management.

2.8 Henry Knowles Beecher – Subjective meaning of pain

The evolution towards current clinical and academic attitudes underpinning the approach to pain became evident in the early twentieth century when the importance of context and the subjective meaning of pain for pain perception were recognised by Henry Knowles Beecher (1904-1976). Beecher identified the impact of psychological factors on the physiology of pain control. He asserted that the emotions and perspectives the patient superimposes on the pain they experience were determined by the degree of psychological discomfort the patient feels and not just the injury itself (Yarnitsky & Dahan, 2015). This theory of the meaning of the injury, and not the injury itself, dictating the intensity of pain differed from Descartes theory of cause and effect (Wright, 2015). In conjunction with a proposed model of ‘total pain’ by Saunders (Clark, 2002) the social, emotional, psychological and spiritual elements of the patient’s pain were recognised and followed the biopsychosocial model of pain (Dobson, 2017).

2.9 The biopsychosocial model

The biopsychosocial model of ‘sickness and disability’ was first introduced in medicine by Engel (1977), when he highlighted the observation that as a medical illness becomes more chronic in nature, then the psychosocial layers, such as distress and illness behaviour, merge to complicate assessment and treatment. Subsequently Loeser (Loeser & Melzack, 1999) applied this model to the assessment of pain, describing four dimensions related to the idea of pain: nociception, pain, suffering and pain behaviour. While nociception is the physiological component of the pain experience, the sensation of pain is the subjective perception of the pain experience, while suffering and pain behaviour can be described as reactions to the signals the brain receives. These can be influenced by previous experiences to pain, negative states of mind and emotions (McCaffery, Ferrell, & Pasero, 2000; Tanner, 2006) the patient’s culture, beliefs and the patient’s social context (Argoff et al., 2018). The neurophysiological understanding of pain has been theorized by expert Melzack (2005), and researchers have demonstrated clinician interpretation of the essential
role higher centres play in the experience of the multidimensional, individual experience called pain.

International pain research and treatment has continued, with a professional organisation, the International Association for the Study of Pain (IASP) being founded by John Bonica, in Seattle in 1973. This was the first international symposium on the treatment and management of pain, and is the world’s largest multidisciplinary organisation that is focussed specifically on pain research and treatment with more than 6500 members worldwide (International Association for the Study of Pain, 2018c).

2.10 Definitions of pain

The most consistently referenced definitions of pain have been from both a medical and a nursing perspective. In 1994 the IASP presented a definition of pain, they described pain as “An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (International Association for the Study of Pain, 2018d). Previous to this, (McCaffery, 1968, p. 95) had reinforced the subjective nature of pain when she stated ‘pain is whatever the experiencing patient says it is, existing whenever the experiencing person says it does’. These definitions, and their principles, are currently used in research and to guide clinical care and nursing interactions.

2.11 The World Health Organisation Analgesic Ladder

The knowledge of pharmacology and in particular analgesia was heightened by the introduction of the analgesic ladder by the World Health Organisation (WHO) in 1986 (Carlson, 2016). This health agency of the United Nations is heavily involved with pain management in the promotion and dissemination of guidelines, advocacy of improved access to opioid analgesics, and national programmes of palliative care and pain relief. Their development of the analgesic ladder for cancer pain pharmacotherapy was a seminal contribution to the field of pain management and is still used to this day. It can be used in a bidirectional fashion depending if it is used for acute or cancer pain. A slower upward direction would be used for cancer pain, whereas a fast downward direction for acute /postoperative pain (Carlson, 2016).
Analgesic methods have progressed since the introduction of the analgesic ladder and the need to incorporate the latest pharmacological and interventional innovations that were not prevalent in 1986 was identified (Carlson, 2016). The recruitment of alternative classes of drugs, and multimodal analgesic strategies including epidural injections, patient controlled intravenous and epidural analgesia have been among the most common modes of delivery of analgesia introduced.

**2.12 Declaration of Montreal (2010)**

International and national institutions have introduced legislation and policies that endorse adequate pain assessment and management for patients. A major international contribution was the Declaration of Montreal announced in 2010 by representatives from around the world and the International Association of Pain (International Pain Summit of the International Association for the Study of Pain, 2011). This declaration also addressed the same values as McCaffery (1968), that the patient is a unique person in their own right. The Declaration of Montreal announced that access to pain management without discrimination was a fundamental human right, and people in pain also had the right to have their pain acknowledged and informed about how it can be assessed and managed, the right to appropriate assessment and treatment by adequately trained health care professionals (International Pain Summit of the International Association for the Study of Pain, 2011).

**2.13 Australian and New Zealand College of Anaesthetists (ANZCA)**

In NZ, the practice and ethics of pain management in anaesthesia, and perioperative medicine are guided by ANZCA. There are around 6400 specialist anaesthesists (Fellows) members, with 1500 anaesthetists in training. This is one of Australasia’s largest specialist medical colleges and guides national practice of pain management in New Zealand (Australian and New Zealand College of Anaesthetists, 2017).

**2.14 Establishment of Clinical Pain Services**

Acute pain services were established in the 1990’s to provide support and education, and play a pivotal role, facilitating communication among the multidisciplinary team to ensure adequate postoperative pain management for patients (Schug, 2015).
2.15 Assessment of pain

Pain assessment is essential to determine the type and scale of pain the patient is experiencing, and also to assess whether pain management is adequate and the effectiveness of the analgesia which is being administered. Although pain is a subjective multidimensional experience, unidimensional tools are often used in postoperative care as the main method of pain assessment. These unidimensional pain assessment methods are quick and easy to use, nonetheless, the psychological, social and spiritual elements of the patients’ experience cannot be measured by a number alone (Topham & Drew, 2017).

The Numerical Rating Scale (NRS), (Schug, 2015) is one of the most widely used methods of measuring pain. Patients are asked to verbally rate their pain intensity on a scale of 0-10 (i.e. 0 means no pain and 10 means worst pain). Other pain scales that are used include the Verbal Rating Scale (VRS), Visual Analogue Scale (VAS) (Ferreira-Valente, Pais-Ribeiro, & Jensen, 2011), and the Faces Pain Scale- Revised (FPS-R) (International Association for the Study of Pain, 2018b).

2.16 Pain as the 5th vital sign

To highlight routine and regular assessment of the patient’s report of pain, a major addition to pain assessment known as “Pain as the 5th vital sign” was instituted by the American Pain Society (APS) in 1996 (Max, Donovan, & Miaskowski, 1995). This campaign was based on quality improvement guidelines, to ensure the pain assessment was as important as measuring the existing four vital signs – pulse, blood pressure, respiration rate and temperature. Alongside this the APS guidelines also recommended that pain be recorded in a way that made it highly visible and could be reviewed regularly by members of the health care team. One of the examples of the recommended unidimensional pain scales was the Numerical Rating Scale (NRS) (Schug, 2015).

However, following years of use in clinical practice, the fallout from the campaign of pain as the fifth vital sign, with its dependence on the use of the numerical rating scale, was associated with unforeseen negative consequences and attributed, in part, to the current opioid crisis (Adams, Bledsoe, & Armstrong, 2016).
Physicians were stated as playing a key role in this opioid epidemic by overprescribing opioids, as well as inappropriate prescribing of opioids for moderate to severe chronic pain (Volkow, 2017). The initiative of treating pain as the fifth vital sign with a numerical rating scale did not take into consideration how the emotional aspects of pain, including anxiety, depressed mood and anger could impact the patients’ scores. This would indicate that physicians should not rely on the numerical rating scale in isolation to determine if additional analgesia was required (Clark et al, 2002).

Clinicians also lacked education in the approach, examination, and management of patients in pain. Inadequate prescriber knowledge regarding the importance of using a multimodal approach to analgesia also led to the over reliance on opioids as the main intervention for both acute and chronic pain (Morone, & Weiner, 2013; Scher, Meador, Van Cleave, & Reid, 2018). As well as a failure to solve the problem of undertreated pain (Scher et al, 2018) there was a dramatic rise in the incidence of opioid addiction and opioid-related deaths (Anson, 2016).

Measuring pain intensity using unidimensional tools such as the numerical rating scale has not improved pain management over the last 15 years, and the unintended outcomes have continued. These include addiction, increased diversion of legally prescribed opioids being given or sold to other individuals for illicit use, and also death (Mehendale, Goldman, & Mehendale, 2013). The use of opioids has more than doubled worldwide between the years 2001 to 2003, and 2011 to 2013 (Berterame et al., 2016) with 240 million opioid prescriptions dispensed in the USA alone in 2015, (Rudd, Seth, David, & Scholl, 2016). Opioids are the first line treatment for moderate to severe postoperative pain, however, influence of information in the media and society about opioid addiction can potentially influence beliefs in the public domain, which could also transfer to the nurses’ professional attitude. In their 2017 study of knowledge and beliefs of 1184 nurses regarding post-operative pain, Van Dijk, Schuurmans, Alblas, Kalkman, & Van Wijck, reported 51% of nurses remained concerned about patients developing opioid addiction.

A recent publication and statement from (Australian and New Zealand College of Anaesthetists, 2018), acknowledged slow-release/long acting opioids were not
recommended for use in the management of patients with acute pain, which ultimately incorporates postoperative pain. Despite all the available research, published evidence and clinical experience, there remain unjustified concerns amongst health professionals regarding the safety of opioids. In a worldwide, regional and national study of the use and barriers of access to opioids, Berterame et al., (2016) identified some of these obstacles. These included an absence of training for, or awareness of medical professionals, fear of addiction, cultural attitudes and fear of diversion.

2.17 Chapter Summary
The knowledge and attitudes to pain have evolved with the findings from great physicians and philosophers over the years, from the assertion of pain as a physical phenomenon, to important theory propositions from specificity, intensity, pattern, and gate control to the neuromatrix theory.

In the early twentieth century the importance of the context and subjective meaning of pain were recognised, along with a model of ‘total pain’ which included the social, emotional, psychological and spiritual elements of pain. This biopsychosocial model of pain was applied to the assessment of pain with the multi-disciplinary approach to pain management being introduced.

Since this time there has been a considerable increase in pain research and new approaches, including the formation of the IASP which is focussed on international pain research and treatment. In New Zealand pain medicine is guided by ANZCA, one of Australasia’s largest medical colleges. Research in epidemiology, medical genetics, sociological and cultural studies have progressed knowledge even further.

Changes made to the treatment of postoperative pain over the last 20 years or more have included the introduction of new techniques for the delivery of analgesia e.g. patient controlled analgesia (PCA) and epidural analgesia, with acute pain services being established to provide further support and education to patients and staff.

However, the use of opioids internationally has more than doubled between the years of 2001 and 2003, and 2011 and 2013 (Berterame et al., 2016). This has
resulted in increased diversion, addiction and death. Despite research and education of nurses regarding knowledge and attitudes to pain, there remain exaggerated concerns regarding the safety of opioids, and patients also continue to suffer moderate to severe postoperative pain (Carr et al., 2014; Manias, 2015).
3 Chapter three: Literature Review

3.1 Introduction
This chapter presents the review of the literature. International evidence from nurse pain knowledge and attitude research will be presented and the gap in the research within the New Zealand context identified. The key findings will be summarised at the end of the chapter.

3.2 Marks and Sachar’s (1973) first exploration of knowledge and attitudes to pain
It was stated as far back as 1973 that moderate to severe pain reported by medical inpatients, associated with inadequate treatment, was due to lack of education of healthcare professionals (Marks & Sachar, 1973). This research signalled the first exploration of knowledge and attitudes to pain. Since then researchers have had differing conclusions as to the effects of education on nurses’ knowledge.

Marks and Sachar (1973) explored the association between under-treatment of pain and lack of education of healthcare professionals. The authors revealed how doctors’ poor understanding of the analgesia they were prescribing, and fear of promoting addiction, had a detrimental effect on the patients they were treating. This 1973 study included 37 medical inpatients and 102 doctors responsible for their pain treatment. At interview it was discovered that 32% of the patients were in severe distress despite being prescribed an analgesic regime, with 41% of the patients experiencing moderate distress. After interviewing the doctors it was established that the patient’s distress and lack of analgesia could be apportioned to the doctor’s fears of causing addiction for the patients who were the receiving opioids. Also, the doctors had underestimated the effective dose range of the opioids they were prescribing for the patients, and overestimated the duration of their action.

This study clearly demonstrated the doctor’s lack of pharmacokinetic knowledge of the opioids they were prescribing and revealed attitudes that influenced clinical behaviour in a manner that was disadvantageous to patients and out of step with evidence. Thus resulting in patients being undertreated for their pain and experiencing unnecessary suffering (Marks & Sachar, 1973).
Marks and Sachar (1973) study has been far reaching, with the key influences in the nursing workforce that build knowledge of pain, and associated attitudes, since being investigated by the nursing profession. McCaffery and Hart (1976) deduced similar findings to Marks and Sachar (1973) from nurses, concluding in their study, that not only do doctors under prescribe opioids, but nurses may also not give patients the amount of analgesia that is prescribed when clinically justified. Their recommendation was that doctors, nurses and patients needed to be educated about the safe use of opioids and to dispel fears of addiction.

However, over forty years on and these attitudes that influence clinical behaviour have persisted. In a survey of 312 cancer care RN’s in Norway, nurses were described as having relatively good pain knowledge but the greatest potential for improvement was in regard to the effects and side effects of analgesic medication, and nurses’ attitudes to how patients express pain (Utne, Småstuen, & Nyblin, 2018). Misconceptions regarding opioids, specifically morphine, were evident in a study of 431 nurses and 40 physicians from five hospitals in Switzerland (Ferreira, Verloo, Vieira, & Marques-Vidal, 2013), with the most cited fears as being related to the side effects of morphine. These side effects included risk of increased sedation, respiratory depression, nausea, vomiting, urinary retention, constipation and pruritus.

3.3 Key figures in the research and development of nurses’ knowledge and attitudes to pain

There have been key investigators in the research and development of nurses’ knowledge and attitudes to pain. In 1997, McCaffrey and Ferrell (1997) reviewed surveys conducted in 1995 of nurse’s knowledge of pain assessment and management, and compared the results of similar surveys conducted in 1988. McCaffrey and Ferrell (1997) identified improvements in nurse’s knowledge of pain assessment, opioid dosing and knowledge of addiction, but the focus of their recommendations was education for nurses and the content of education courses.

McCaffery, Pasero, and Ferrell (2007) again investigated the assessment of patient pain by nurses, examining metrics of recorded patient-reported pain score and the selected analgesic drug and dose administration given in response. Data were
surveyed from 1990 to 2006 reviewing RN’s decisions and responses to vignette surveys of patients displaying different behaviours when experiencing post-operative pain, and aimed to identify trends in nurses’ recording of the patients’ report of pain and their analgesic choice.

The KASRP survey was given to a convenience sample of RNs at the beginning of the day at pain conferences’ held throughout the Unites States of America (USA). Data from RNs attending pain conferences over this sixteen year period showed a trend toward improvement in nurses’ pain assessment, but the nurses’ analgesic choices continued to be largely inadequate in relation to the pain score declared by the patient. McCaffery et al. (2007) concluded that many nurses’ responses indicated attitudes to patient pain behaviours that were not supported by evidence and undermined sound pain assessment and management. This would indicate the nurses’ attitude was directly influenced by the patients’ behaviour, and consequently influenced the nurses’ analgesic choice.

McCaffery et al. (2007) concluded from the results that nurses failed to acknowledge patients’ self-report of pain as the most reliable indicator of pain. The authors attributed patients’ pain being undertreated due to nurses’ poor understanding of how to select safe effective opioid doses. These findings corroborated the findings of Marks and Sachar (1973). Subsequent studies have continued to establish the same conclusions (Gretarsdottir et al., 2017; Moceri & Drevdahl, 2014; Vickers et al., 2014). The recommendation from McCaffery et al. (2007) was to have protocols in place to guide the nurses’ safe practice and also the development of appropriate educational programmes to ensure nurses were competent in pain assessment and opioid titration.

### 3.4 The last decade

In the last decade numerous studies have confirmed the continued complex scenario in which unsatisfactory patient outcomes are associated with nurse pain knowledge and attitudes, and survey results to measure nurses’ knowledge and attitudes to pain were below the expected minimum (Brant et al., 2017; Gretarsdottir et al., 2017; Latina et al., 2015; Moceri & Drevdahl, 2014; Vickers et al., 2014). Researchers have continued to study nurses’ knowledge and attitudes to pain, but the literature
has described slow movement towards improved pain management. It has been proposed that nurses’ attitudes surpass the nurses’ knowledge in influencing the nurses’ clinical decisions on managing the patients’ pain, and can be influenced by nurses’ own biases and also patient behaviour.

Nurses’ attitudes during pain assessment became apparent when Lewis, Corley, Lake, Brockopp, and Moe (2015) led professionally directed small group discussions to determine the influences on clinical decision making related to pain management. Critical care nurses reported negative bias towards specific groups of patients including those patients who were suicidal, patients with substance abuse disorder, patients who had undergone open-heart surgery and those noncompliant with their medical regime.

Bernhofer et al. (2016) also attempted to establish if nurses’ personal values affected their pain management decisions. Bernhofer et al. (2016) examined the experiences of nurses who participated in an education class which included values and decision making in pain management. Using qualitative content analysis, they identified nurses themselves were aware of the need for pain management education. More importantly, Bernhofer et al. (2016) identified nurses also recognised the need to better understand the patients and also themselves.

Despite Bernhofer et al. (2016) determining nurses’ values contributed to decision making in pain management, not all the nurses in their study were clear in their understanding of this definition of values. However, nurses did comment on the importance of listening to the patients’ ‘stories’ and undertaking a more complete assessment before they formed their own opinion about the patient, and also gaining an awareness of the possible different responses to patients with a history of substance abuse may have (Bernhofer et al., 2016).

3.5 The development and validation of knowledge and attitudes to pain measurement tools

On review of the literature there have been various tools developed which have been used to measure nurses’ knowledge and attitudes to pain using the quantitative method of research. These tools were examined to enable selection of a tool which
was most fit for purpose in the specific context being studied and with adequate validity and reliability.

3.5.1 **Synopsis of the available tools and their contribution**

The Knowledge and Attitudes Survey Regarding Pain (KASRP) was introduced by Ferrell and McCaffery in 1987 (Ferrell & McCaffery, 2014). The purpose of this tool was to measure the knowledge and attitudes of health care workers on the subject of pain. It was also useful as a pre/post-test measure to rate learning outcomes following educational programmes on pain.

The Knowledge and Attitudes Survey Regarding Pain tool (KASRP) was introduced by Ferrell and McCaffery in 1987 (Ferrell & McCaffery, 2014). This tool has been used by researchers since its inception, with some revision over the years to reflect changes in pain management practice. The authors of the tool, Ferrell and McCaffery, are well recognised internationally in their specialised fields of pain management. McCaffery’s 1968 definition of ‘Pain is whatever the experiencing person says it is, existing whenever the experiencing person says it does’ is

The Pain Knowledge Questionnaire (PKQ), unpublished, was used by Brockopp et al. (2004); Brockopp, Ryan, and Warden (2003). This tool was devised to reflect the basic concepts that nurses should know in order to provide effective pain management to their patients.

The Clinical Decision-Making Questionnaire for Pain Management (CDMQP) was also used by Brockopp et al. (2003) and Brockopp et al. (2004) to assess how much time and energy health care professionals were willing to spend on addressing their patients’ pain. Also, it was used to investigate healthcare professionals’ bias towards patients depending on their condition.

The Brockopp and Warden Pain Knowledge/Bias Questionnaire (BWPKBQ) evolved from the CDMPQ and continued to be used by researchers internationally (Lewis et al., 2015; Schreiber et al., 2014). It is easy to administer and assesses basic knowledge regarding pain management.

3.5.2 **The Knowledge and Attitudes Survey Regarding Pain (KASRP)**

Over thirty years ago, the Knowledge and Attitudes Survey Regarding Pain tool (KASRP) was introduced by Ferrell and McCaffery (2014). This tool has been used by researchers since its inception, with some revision over the years to reflect changes in pain management practice. The authors of the tool, Ferrell and McCaffery, are well recognised internationally in their specialised fields of pain management. McCaffery’s 1968 definition of ‘Pain is whatever the experiencing person says it is, existing whenever the experiencing person says it does’ is

29
continuously used as a reference for clinicians addressing and treating patients in pain (McCaffery, 1968, p. 95).

The KASRP tool was well validated, with reliability and validity having been tested internationally (Brant et al., 2017; Vickers et al., 2014). Test retest reliability of the tool has been assessed by repeat testing and comparing results of different groups including nurses at different levels and senior pain experts. The tool was recognized as discriminating between levels of expertise and found to have acceptable reliability ($r > 0.80$) ($n = 60$) (Ferrell & McCaffery, 2014). Internal consistency was assessed for both knowledge and attitudes using items relevant to each domain and determined to be acceptable ($r > 0.70$) (Ferrell & McCaffery, 2014). The authors of the tool stated content validity of the tool was established by review of pain experts and the content was derived from current standards of pain management by the American Pain Society, the World Health Organisation (WHO), and the National Comprehensive Cancer Network for Pain Guidelines (Ferrell & McCaffery, 2014).

Despite originally being devised in the specialty of chronic pain and palliative care in the USA, the KASRP tool has been used internationally in a vast array of areas. These include testing oncology nurses in Turkey (Yildirim, Cicik & Uyar, 2008), nurses on medical units in Hong Kong (Lui, So, & Fong, 2008), registered and assistant nurses in general surgery, orthopaedics, neurosurgery, ear-nose-throat surgery, and obstetrics/gynaecology in Greece (Kiekkas et al., 2015). Jarret et al (2013) used the KASRP in the USA to measure nurses learning outcomes pre and post pain education and Vickers et al (2014) tested surgical nurses in Ireland.

The KASRP tool consists of 22 true or false questions and 15 multiple choice questions covering topics including patient pain behaviour, side effects of analgesia, multimodal analgesia, drug abuse and dependency, and pharmacology of drugs and cultural considerations. There are also two patient clinical vignettes that require participant’s decisions about pain assessment and interventions (Appendix 1). The patient clinical vignette questions were incorporated into the tool in 2006 (McCaffery et al., 2007).
Ferrell and McCaffery (2014) established an 80% minimum score as representing adequate knowledge and attitudes. However this minimum score has varied between researchers, as has the measurement term ‘adequate’, or ‘good’ or even ‘acceptable’ score. Latina et al. (2015), Vickers et al. (2014), and Moceri and Drevdahl (2014) used 80% or above as representing adequate knowledge and attitudes, whereas Yava et al. (2013) used 70% as a minimum score. Keen et al. (2017) and Brant et al. (2017) did not indicate a minimum pass rate, Gretarsdottir et al. (2017) and Kiekkas et al. (2015) used a statement that the higher the scores, the better the knowledge about postoperative pain and the more positive the attitudes towards it.

3.5.3 The Pain Knowledge Questionnaire (PKQ)

The unpublished version of the Pain Knowledge Questionnaire (PKQ) was used by Brockopp et al. (2003). This tool was devised to reflect the basic concepts that nurses should know in order to provide effective pain management to their patients. Pain knowledge scores of more than 80% were determined as an acceptable range by educators in the hospital and university setting. Content validity of this tool was established by a panel of six experts in the field of pain management (Brockopp et al., 2003).

The PKQ consisted of twenty-five true/false questions regarding the assessment and management of pain (Brockopp et al., 2003). Individual item and total scores could then be analysed to determine deficits in the health care professionals’ ability to effectively manage pain.

Brockopp et al. (2003) stated the instrument had been used with approximately 250 physicians and nurses at the study institution in Kentucky, USA, to assess basic pain management knowledge (Brockopp et al., 2003). In 2004 test re-test reliability of the PKQ was conducted on 26 practising nurses over a nine-day period, and a reliability coefficient of 0.86 was calculated (Brockopp et al., 2004).

The PKQ also continues to be used as a standalone tool by researchers (Van Dijk et al., 2017) and has been described by researchers as easy to administer with taking little time to complete – 10 to 15 minutes (Lewis et al., 2015; Schreiber et al., 2014). The tool was assessed as fit for purpose by Lewis et al. (2015) who were able to
ascertain in their research that there were significant differences in subjects mean knowledge scores after professionally directed small group discussions.

3.5.4 The Clinical Decision-Making Questionnaire for Pain Management (CDMQP)

Alongside the PKQ, a questionnaire named the Clinical Decision-Making Questionnaire for Pain Management (CDMQP) was also used (Brockopp et al., 2003) and (Brockopp et al., 2004). As far back as 1998, (Brockopp et al.) had recognised the kind of care patients in pain received depended on the context in which the health care professionals worked, and the health care professional’s own personal characteristics. In 2003, with little attention paid to the context of patient situations or how the personal characteristics of the health care professional could influence pain management behaviours, Brockopp et al. (2003) used this tool to assess how much time and energy health care professionals were willing to spend time taking care of their patient’s pain.

This instrument was designed to allow investigators to select the patient population they wished to assess, and in this instance the investigators addressed patients with cancer, history of substance abuse, Acquired Immune Deficiency Syndrome (AIDS), history of suicide and the elderly. The participants were required to rate how much time and energy they would spend on managing the patients pain, rating from 1 = little time and energy, to 5 = maximum time and energy (Brockopp et al., 2003).

The content validity of the tool was established by a five-member panel of nurse experts in the field of pain management (Brockopp et al., 2003) and (Brockopp et al., 2004). Test re-test reliability on a separate sample of twenty-nine nurses had yielded a correlation coefficient of 0.84 by the researchers in 2003 (Brockopp et al., 2003) and test re-test reliability on a separate sample of thirty-one nurses yielded a correlation coefficient of 0.82 in 2004 (Brockopp et al., 2004). As the questionnaire could be used with two or more patient categories and differing responses can be expected, calculation of internal consistency was deemed not relevant by the authors Brockopp et al. (2003) and Brockopp et al. (2004).
The second part of the tool (CDMQP) was used to investigate health care professional’s bias towards patients depending on their conditions e.g. cancer, AIDS. Therefore, it was unsuitable for this author to use, as this author was looking to investigate the knowledge and attitudes of health care professionals working in postoperative care.

3.5.5 The Brockopp and Warden Pain Knowledge/Bias Questionnaire (BWPKBQ)

Following this 2004 research, the Brockopp and Warden Pain Knowledge/Bias Questionnaire (BWPKBQ) evolved and continued to be used by researchers internationally (Lewis et al., 2015; Schreiber et al., 2014). The PKQ part of the tool also continues to be used as a standalone tool by researchers (Van Dijk et al., 2017).

The first part of the BWPKBQ is a twenty four item questionnaire designed to examine knowledge of pain management. Participants are asked to respond to a series of statements by circling either true or false. Correct responses to items are scored as 1, and incorrect responses are scored as 0. Total knowledge scores can range from 0 to 24, where higher scores reflect more knowledge on how to effectively manage pain. Both individual items and total scores can be analysed to show deficits (or aptitudes) in health care providers’ abilities to effectively manage pain. Test-retest reliability coefficient was calculated at 0.86 (Brockopp et al., 2003).

For the purpose of this study the KASRP tool was used due to the tool’s wide international use in various health systems since its inception. This breadth of use supports transferability for its use in this study. In the last five years the tool has been used by researchers including Gretarsdottir et al. (2017) in Iceland, Kiekkas et al. (2015) in Greece, Latina et al. (2015) in Italy, Yava et al. (2013) in Turkey, Vickers et al. (2014) in Ireland, Moceri and Drevdahl (2014) in USA, Keen et al. (2017) in Indianapolis, and Brant et al. (2017) in Canada.

The tool also has the benefit of having questions which encompass a broad scope of areas in pain management including paediatric, geriatric, opioid withdrawal, and pharmacology. The patient clinical vignette questions instigate the participants’ attitude and response to the patients self-report of pain when displaying conflicting
behaviours. However, despite having easy transferability and being used regularly internationally since its inception, the tool does have limitations. The tool is almost entirely based on pharmacological pain management, with no options for nursing skills to implement non-pharmacological measures e.g. positioning, distraction. The quantitative focus of the tool means the researcher is unable to capture any subjective views from participants; therefore participants are unable to provide any reasons for their decision making. Furthermore, any demographic information, which could be used to identify associations between participants answers, have to be collected separately by the individual researcher who uses the tool.

Additionally, international studies that have utilised the KASRP tool have shown consistent results below 80%, which was recommended by the authors of the tool (Ferrell & McCaffery, 2014). As far as this author was aware, there have not been any studies which have reported an overall score over 80%, which would indicate that either there was a serious deficit in nurses’ knowledge and attitudes to pain internationally, or there was a deficit in the tool, given that nurses’ knowledge and attitudes have so many variables.

3.6 Foundations of knowledge

To initially understand the differences between knowledge and attitudes and how these affect the nurse’s management of the patient’s pain, the author investigated the foundations of the nurses’ knowledge. In making clinical decisions nurses may draw on knowledge from a range of sources to inform their nursing practice, including scientific, experiential, personal and professional knowledge.

Scientific knowledge informs health practices through problem solving using a systematic, logical and rigorous approach. This knowledge has been generated through the research of others and involves sourcing and critiquing of appropriate published research to inform nursing practice (Moule, 2018; Schug, 2015).

Experiential knowledge can be acquired through other methods such as traditions in nursing, intuition and tacit knowledge (Moule, 2018; Tanner, 2006). Traditions in nursing can be passed down through generations of nurses and also passed on from other nurses by role modelling and observed practice (Moule, 2018). Intuition is a
process based on both knowledge and experience. It can be used with knowledge in clinical practice as a support in decision making which increases the quality of patient care. Despite it being suggested that intuition and tacit knowledge lack objectivity with no rationale to base decisions taken in nursing care, intuition plays a role as a base for decision making that supports safe patient care, and is a validated component of nursing clinical care expertise (Melin-Johansson, Palmqvist, & Rönnberg, 2017).

3.6.1 Personal and professional knowledge

Personal knowledge can be shaped through experience which helps inform the nurses’ practice decisions (Mackintosh-Franklin, 2014a). However, Brant et al. (2017) claimed nurses who had personal experiences of pain showed no statistical differences in their knowledge and attitudes scores. In their study to determine nurses’ knowledge and attitudes about pain, 50% of the nurses reported having experienced a few episodes of moderate to severe pain, and 25% reported currently living with chronic pain. This result is disappointing, as despite a percentage of the nurses experiencing and even living with pain, it did not improve their knowledge and attitudes to pain. This reinforced the findings from Duke, Haas, Yarbrough, and Northam (2013) who discovered personal experiences of pain had no relationship with student nurses knowledge and attitude scores.

The first responsibilities regarding patient pain management is when students undertake their undergraduate training. However this does not guarantee that students are fully informed to manage patient’s pain. Ung, Salamonson, Hu, and Gallego (2015) claimed student’s knowledge of pharmacology, psychology, physiotherapy and physiology were insufficient to enable them to meet individual patient’s needs and achieve reliable pain management for the patients. Also, despite the subject of pain management being covered in every semester of a nursing baccalaureate programme in Texas, Duke et al. (2013) demonstrated understanding and retention of knowledge of pain was not sufficient. With first-semester junior’s scoring a mean of 59.65, second-semester juniors a mean of 61.23 and first-semester seniors achieving a mean of 67.67. The authors did acknowledge, however, that improving knowledge does not automatically change attitudes and behaviour, and
that various approaches needed to be tested to adequately prepare their students to facilitate effective pain management for patients.

Duke et al. (2013) found just one semester before graduation, first-semester senior students only scored 68% on the KASRP survey, which was well below the desired 80% that was considered to be acceptable by Ferrell and McCaffery (2014), however it was close to RN results determined by other researchers, 72% for Brant et al. (2017); Gretarsdottir et al. (2017) and 65.7% for Vickers et al. (2014).

Duke et al. (2013) also discovered that nine items were missed by > 60% of participants, and these nine most frequently missed items were primarily related to knowledge about pain medications. This could indicate that even on the cusp of graduation, nurses do not demonstrate adequate knowledge and attitudes to manage a patients’ pain.

It was suggested by Duke et al. (2013) and Mackintosh-Franklin (2017) that professional preparation of nursing students’ was falling short in the arena of knowledge and attitudes to pain. Pre-registration education did not adequately address matters of pain pathophysiology, assessment and management (Duke et al., 2013; Mackintosh-Franklin, 2017). Following a review of the content of seventy one undergraduate nursing programmes in the United Kingdom (UK) for reference to pain in the curriculum, Mackintosh-Franklin (2017) established that pain did not appear in any programme aims or learning outcomes and was present in only 8.5% of the undergraduate programmes. Her recommendation was a review of the current approach to content of undergraduate nurse education in the UK, and to ensure pain was featured in pre-registration nurse education.

The new graduate nurse uses various methods of knowledge to inform their professional knowledge to put theory into practice. As well as scientific, experiential and personal knowledge they will also use observation of professional role models, clinical reasoning, critical thinking and reflection (Moule, 2018; Tanner, 2006). These will all have an impact on the nurses’ knowledge of pain and how they use this knowledge for patients’ pain management.
In summary, nurses knowledge is derived from a variety of sources including research based scientific knowledge, experiential, personal and professional experience. Nonetheless, student nurse knowledge of pain has shown to be inadequate (Duke et al., 2013; Ung et al., 2015) which raises concerns for the pain management they will provide to patients in their care post-graduation. Also, despite reporting personal experience of pain, this did not have any significant influence on RN’s knowledge and attitudes to pain.

3.6.2 The shaping of attitudes

The psychological definition of attitude refers to a set of emotions, beliefs, feelings, and behaviours towards socially significant objects, groups, events or symbols. The structure of attitudes is described in three components, as the affective, behavioural and the cognitive component. The affective component involves a person’s feelings and emotions about the object. The behavioural component involves the way the persons attitude influences how they act or behave. The third, cognitive component, involves a person’s belief and knowledge about an object (McLeod, 2018). Attitudes can have a powerful influence over the person’s behaviour and are often the result of experience or upbringing. Despite attitudes being enduring, they can also be changed (McLeod, 2018). Price (2015) stated that attitudes serve an individual purpose to help maintain the individuals understanding of self. Also, an attitude expresses the individual’s ideas about what is normal, right, realistic, sustainable or typical of an individual (Price, 2015).

Consequently, the nurse’s attitude has the potential to have a major impact on the nursing care they give to the patient. As stated by Hunink et al. (2003, p. 78) “Value judgements underlie virtually all clinical decisions” which suggests that nurses attitudes will overlap with knowledge, and it is the nurses attitude which will influence the way the nurses knowledge and resources are used. These attitudes will inevitably have an impact on how the nurse understands the behaviour of others, and therefore how they use their understanding of themselves to deliver care to their patients (Price, 2015). This could have a negative effect on the nursing care that is provided. As stated by Vickers et al. (2014) nurses were unaware of not only their lack of knowledge, but their poor attitudes regarding pain management. Therefore if nurses do not have this insight into their attitude, then they are not able to change it.
3.6.3 Te Kaunihera Tapuhi o Aotearoa/The Nursing Council of New Zealand

Professional attitudes are articulated in national codes of practice. The practice of the RN in New Zealand is governed by the Te Kaunihera Tapuhi o Aotearoa/The Nursing Council of New Zealand (NCNZ) under the Health Practitioners Competence Assurance Act 2003. This regulatory authority has a Code of Conduct with a set of standards which nurses are expected to uphold (The Nursing Council of New Zealand, 2011, 2012). These standards include respect, trust, partnership and integrity. The KASRP tool used in this study was used to measure knowledge alongside attitudes. The standards which are upheld by the NCNZ are not specifically articulated in the KASRP tool questions; however, they are in keeping with the attitude expectations that were being tested.

3.6.4 Te Tiriti o Waitangi/ The Treaty of Waitangi

Furthermore, the principles of Te Tiriti o Waitangi/The Treaty of Waitangi, partnership, protection and participation, are integral to providing culturally responsive nursing services to people in New Zealand. Included in these principles, are respect, dignity, individuality, cultural needs and values (The Nursing Council of New Zealand, 2011). All of these are important professional attitudes which the nurse is required to uphold, and there is an expectation that professional attitudes will supersede individual attitudes (Price, 2015).

The influence of a person’s cultural perspective on the origin of pain is important to understand for Māori patients and those patients of diverse cultures. The Māori view of health is multidimensional, incorporating a balance between spiritual, emotional/mental, physical, and family/community. The most widely recognised Māori model of health is ‘Te Whare Tapa Wha’, which likens the health dimensions to the four supporting walls of a house, in that all four dimensions are required for a sound whole (Magnusson & Fennell, 2011). However, the biomedical approach to addressing pain does not encompass this holistic framework. Likewise, other cultural traditions may not be evident to the nurse, for example the Hindu culture promotes a positive acceptance of pain, regarding pain and suffering as a consequence and unfolding of karma (Whitman, 2007). A part of the Chinese philosophy is to bear suffering from a young age, which may result in the Chinese patient’s reluctance to report pain or seek treatment (Lewis & Upsdell, 2018).
3.6.5 Professional attitudes

The pre-registration students’ attitudes to pain will have been informed by their own value system, formed over time as part of their personal development (Carr et al., 2014). This can originate from the student’s own cultural environment, social groups, religion, age, gender and lived experiences. Their professional attitudes and values will then be grown from these individual attitudes and values as part of the student’s socialisation into the nursing profession. However, Mackintosh-Franklin (2014a) suggested that an active interest in pain was essential for nursing students. Without active interest she postulated apathy, aversion to change, and continued poor pain management practices are likely to continue. This assertion came out of a qualitative longitudinal study using two semi-structured interviews eighteen months apart, of sixteen volunteer students from a cohort of undergraduate student nurses in the UK.

Professional attitudes were also noted to be learned from the clinical environment. As stated by DiCuccio (2015), attitudes can be learned by imitating other nurses, and part of the way nurses learn was from the expertise, preceptorship, mentorship and imitating their peers. However, this can have a positive or negative effect on the nursing care that is being provided, depending on the attitudes that are being imitated (DiCuccio, 2015). Also, this attitude will be transferred to the nurses’ management of patients’ pain which will have a direct an impact on the patients’ pain experience.

Other influences on nurses’ attitudes were determined by Tanner (2006) when conducting a review of nearly 200 studies to address clinical judgement in nursing. Tanner (2006) discovered the nurses’ clinical judgements were influenced by the nurses’ own culture and the culture of the nursing unit. This was corroborated by Ho and Johnson (2013) who demonstrated in their study that cultural differences influence people’s perception about pain. Also, nurses’ pain assessment can be influenced by the nurses’ own cultural beliefs and attitudes about the meaning of pain and also by the characteristics of the patient (Tait & Chibnall, 2014). This can affect how the nurse perceives and responds to the patients expressions of pain (Bernhofer et al., 2016). This can ultimately have an influence on the pain
management the patient receives, as the nurse may project their own attitude about pain onto the patient (Tait and Chibnall, 2014).

Nurse’s personal opinions about patients may be disproportionately influential when nurses make decisions about pain treatment (Lewis et al., 2015; McCaffery et al., 2000; Schreiber et al., 2014; Vickers et al., 2014). Values and attitudes the nurse holds personally towards pain and its treatment can influence the way the nurse uses their knowledge and resources (Hirsh, Jensen, & Robinson, 2010). Consequently, if the nurse is unaware of their own attitudes to pain management, they are unable to make any personal changes.

Notwithstanding the differences in cultural responses to pain, in 2007 (McCaffery et al.) stated that nurses had been shown to be misinformed about possible behaviours of patients with pain. There appears to be no change in this attitude to date as numerous studies addressing nurse knowledge and attitudes to pain have continued to demonstrate that nurses are more likely to respond to patients who show overt, non-verbal expressions of pain, compared with the more stoic smiling patient (Brant et al., 2017; Moceri & Drevdahl, 2014; Vickers et al., 2014).

These influences of attitude on the nurses’ professional responses and decisions they make with regard to the patients pain may go further than pain assessment and management. The influence of attitude could account for nurses’ apparent concerns regarding using opioids for pain management. Studies have illustrated that nurses did not administer adequate doses of opioids to the patient experiencing pain (Moceri & Drevdahl, 2014; Morley, Briggs, & Chumbley, 2015; Vickers et al., 2014) and the consequence of this was the patients’ pain being undertreated.

3.6.6 Knowledge of pharmacology
Researchers have focussed on various areas in attempting to improve and understand nurses’ knowledge and attitudes to pain, and nurses’ knowledge of pharmacology and analgesia. The KASRP tool has frequently been utilised to investigate analgesic knowledge with specific questions relating to pharmacotherapeutic aspects of important drugs in the analgesic class. Consequently, deficits in nurses’ pharmacological knowledge of analgesia have been discovered by researchers

Vickers et al. (2014) used a modified version of the KASRP tool to survey a convenience sample of 94 nurses working in acute surgical wards of three major academic teaching hospitals in Dublin, Ireland. The authors do not give any information about what modifications were made to the tool, only that it was reviewed by a pharmacist, two academic supervisors, a doctor and clinical nurse specialist in pain to address content validity among Irish surgical nurses. The overall mean score achieved by the respondents was 65.7% with only 3.2% achieving an overall score of 80% or above, which was the recommended score by the authors of the tool for nurses to have adequate pain knowledge and attitudes.

Vickers et al. (2014) reported widespread knowledge deficits for participants with regard to pharmacological knowledge. Of the eleven questions that were answered incorrectly by over half of all participants, ten related to pharmacology. These findings continued in the same manner when Moceri and Drevdahl (2014) surveyed 91 Emergency Department (ED) nurses in the USA. They also established that of the eight questions answered most incorrectly by more than 50% of respondents on their KASRP, five were related to opioid pharmacology and dosage.

Brant et al. (2017) had seven questions in their survey, which scored below 50%, were related to pharmacology and the most commonly missed questions included pharmacological management of pain, side effects, over sedation, dosage of analgesia and drug interactions. The ten items with the lowest number of correct answers for Gretarsdottir et al. (2017) were related to pharmacology – dosage, route, administration, drug interactions, mechanism of action and side effects.

This trend seemed to continue further afield with a large survey of 246 nurses in Turkey also finding a lack of knowledge in pharmacological features of drugs and knowledge of duration of action of opioids (Yava et al., 2013). However, despite this being a good sized study, caution must be used when drawing comparison between studies set in divergent or a substantially different healthcare setting. Protocols in this Eurasian country could be different, as in particular, the authors Yava et al.
(2013) stated that institutional or medical law in Turkey regarding using drugs were not investigated and also the researchers pointed out that opioids in Turkey are held outside of the nursing unit which could impact nurse’s use and knowledge of opioids.

Continuing on to a large study in Greece, questions relating to pain medications and their administration were quoted as being the most commonly missed questions by participants in a study by Kiekkas et al. (2015). Their modified version of the KASRP tool was used to survey knowledge and attitudes toward postoperative pain of 182 registered and assistant surgical department nurses. There was a limitation to the generalisability of these results, as due to the small number of RN’s in Greek hospitals, the authors included the assistant nurses in their study. Also, Kiekkas et al. (2015) added ‘unsure’ as a choice in the respondents’ responses, instead of just ‘yes’ and ‘no’.

Members of faculty were not even able to provide correct responses regarding analgesia when using the KASRP in a study by Duke et al. (2013). Faculty were surveyed alongside baccalaureate nursing students and the nine most frequently missed items in the study were primarily related to knowledge about pain medications and administration. This is a concern if even faculty, who were responsible for educating the students, were not able to provide correct responses regarding analgesia.

Conclusions drawn from these researchers highlight the deficits in areas of education. The review and restructure of nursing curricula was recommended by Vickers et al. (2014), Yava et al. (2013), and Duke et al. (2013). With competency-based learning being recommended by Brant et al. (2017), and also role play and discussion to better illustrate pain assessment and patient behaviours. Also, the need to incorporate guidelines (Yava et al., 2013), and analgesic protocols, using a multimodal approach to guide nurses in making safe and effective decisions regarding pharmacological management of pain (Vickers et al., 2014). Ensuring these protocols, procedures and guidelines were evidence based (Duke et al., 2013; Vickers et al., 2014).
In their conclusion, Moceri and Drevdahl (2014) highlighted the complexity of pain assessment and the need for better understanding of pain and associated attitudes. They concluded it was critical that nurses had a deep understanding of opioids. While Kiekkas et al. (2015) concluded that it was the department of employment and the quality of professional experience the nurse gained, rather than professional experience alone, which could be more influential to nurses’ knowledge and attitudes towards pain.

These consistent findings of Brant et al. (2017), Kiekkas et al. (2015), Moceri and Drevdahl (2014), Vickers et al. (2014), Yava et al. (2013) and Duke et al. (2013) across different groups of health care professionals, RN’s, assistant nurses, junior and senior student nurses and even faculty, demonstrated a widespread deficit in knowledge and attitudes particularly to pharmacology and questions related to opioids. The reason for this was undetermined, however, as previously postulated by Hunink et al. (2003) nurses’ attitudes will overlap with knowledge and it was the nurses’ attitude that influenced the way nurses knowledge and resources was used. Therefore, despite the role of the health professional, there was a widespread deficit in knowledge and attitudes which could be due to personal attitude take over professional attitude and the knowledge used.

### 3.7 Influence of education on nurses knowledge and attitudes

There have been conflicting results from researchers as to the relationship between level of education on nurses’ knowledge and attitudes to pain. Researchers have also tested immediate and long term effects of educational interventions, including input from patients, with mixed results.

#### 3.7.1 Higher education

Higher education levels have resulted in increased knowledge and attitudes to pain (Gretarsdottir et al., 2017; Keen et al., 2017; Lewthwaite et al., 2011; Yava et al., 2013). A weak positive association with higher education levels and correct answers was found by Moceri and Drevdahl (2014). Whereas Latina et al. (2015) found no statistical association related to level of education regarding nurses’ knowledge and attitudes to pain.
3.7.2 Effects of educational interventions

An educational intervention by Keen et al. (2017) identified a greater level of learning engagement with a brief targeted educational programme using an interdisciplinary approach. The first educational session was delivered by a pharmacist, covering pharmacology and pathophysiology content, and the second session was delivered by RN’s using case studies paired with video scenarios, focussing on attitudes about pain. Their conclusion was the sample that completed both the pre and post-test surveys had a higher percentage of bachelor prepared nurses, and a lower mean age than the nurses who only completed the pre-test survey (Keen et al., 2017).

Keen et al. (2017) approach differed to other researchers, and the rationale for this method of teaching was to provide simulated realistic situations to engage the participants to apply knowledge to making clinical decisions. A convenience sample of 24 nurses from three medical and surgical inpatient units in a university affiliated teaching hospital in the USA, completed a KASRP pre-survey to assess their education needs before the educational programme, then again immediately after the second education session. Keen et al. (2017) targeted those missed items that 75% or fewer participants had answered correctly on the first KASRP survey and used them in the content of the final education sessions. Despite caution being required while considering the results from this small study, there may be learning to be taken from the teaching methods used by Keen et al. (2017) as to working towards addressing not only nurses’ knowledge but more importantly nurses’ attitudes to pain management.

Interestingly, the items Keen et al. (2017) targeted as those items most missed were consistent with other researchers findings; risk of respiratory depression, cancer pain management, opioid abuse and opioid withdrawal (Brant et al., 2017; Gretarsdottir et al., 2017; Vickers et al., 2014) opioid conversion (Gretarsdottir et al., 2017; Latina et al., 2015) opioid pharmacokinetics, dose adjustments, and adjuvant pain therapies (Brant et al., 2017).

Gretarsdottir et al. (2017) reached the same conclusions as Keen et al. (2017) that higher education resulted in increased knowledge and attitudes to pain. Gretarsdottir
et al. (2017) used the KASRP tool to conduct a large survey of 235 RN’s to address primary determinants of knowledge and attitudes regarding pain among nurses. The original English version of the KASRP tool was translated to Icelandic and had previously been tested on 170 nurses and nursing students, and its internal consistency was found to be acceptable (Cronbach’s alpha = 0.75). Based on recommendations by the participants in a previous pilot study, the authors added the option of ‘don’t know’ to each question. This means the results cannot be directly compared to other KASRP tool results.

Equally, studies on the effects of educational interventions on nurses’ knowledge and attitudes to pain have showed inconsistent results. Nurses’ knowledge and attitudes were most effective immediately after an education session compared to six weeks later (McNamara et al., 2012). While Jarrett et al. (2013) found knowledge and attitude scores remained higher six months after an education session, compared to immediately pre-test and post-test (Jarrett et al., 2013). In their study, Lewis et al. (2015) used small group discussions, and their results indicated that mean knowledge scores differed significantly after the intervention (pre-intervention mean = 18.28, standard deviation = 2.33; post-intervention mean = 22.16, standard deviation =1.70; t (31) = -8.87, p < .001).

A mixed method experimental approach, with a convenience sample of 59 nurses, was used by McNamara et al. (2012) to examine the effects of an acute pain educational programme. Their validated questionnaire consisted of eighteen statements related to pain management and experience of pain assessment scales. The sample used by Jarrett et al. (2013) was large with the authors stating the sample consisted of 206 nurses and 164 final post-test participants. Jarrett et al. (2013) used a much larger longitudinal, quasi-experimental quantitative study of 206 RN’s. The higher scores regarding six month retention of knowledge and attitudes could be attributed to the fact participants were informed that a certificate of merit would be awarded if participants completed all three surveys and these certificates would be used for merit consideration at their annual review by nursing administration. This had a risk of potential bias for the participants.
Furthermore, flyers were posted by the clinical nurse specialists for the months between the original presentation and the retest period six months later, as reminders to complete the six month survey. The authors stated the flyers included topics covered in the content of the original presentation. Jarrett et al. (2013) emphasized that none of the flyers included specific content found on the survey, however these flyers would have had an influence on maintaining some knowledge for the participants, therefore influencing the final study results.

Interestingly, major changes were precipitated in one institution, regarding the management of patients’ pain, following the results from a clinical research project to evaluate an educational intervention in association with both nurses and patients (Schreiber et al., 2014). A quasi-experimental pre and post-intervention design was used by Schreiber et al. (2014) to evaluate an educational intervention for nurses, with data being collected before the educational intervention and three months after. The Brockopp Warden Pain Knowledge/Bias questionnaire was used which aimed at measuring not only nurses’ knowledge but also biases. This was a large study with 341 nurses included from medical, surgical and critical care areas (203 pre, 138 post), and in concurrence with sixty patients (30 pre and 30 post) who recorded numerical assessments of their pain every four hours in a pain diary.

Patient charts were reviewed to compare patients’ pain assessment with nurses’ documentation. A 50% decrease in the mean difference between patients’ assessment of pain and nurses’ documentation ($p < .04$) was found post-intervention. However, there were no statistically significant differences found in pre ($M = 16.53, SD = 2.16$) and post-intervention ($M = 16.94, SD = 2.20$) total pain knowledge scores. The authors concluded that there still remained a challenge of finding the most effective method for changing biases toward specific patient populations and increasing knowledge regarding pain management.

A second study at the same institute was performed by Lewis et al. (2015) and on this occasion the aim was to evaluate the effectiveness of professionally directed small group discussions on critical care nurses knowledge and biases related to pain management. Like Schreiber et al. (2014), the tool used was a modified Brockopp and Warden Knowledge/Bias questionnaire which was administered before and after
the small group discussions. The groups consisted of two to six nurses per group, with (N = 32) critical care nurses participating in the study. The post intervention evaluation was undertaken approximately two weeks after the intervention, and this was considered a limitation by the investigator, as they were unable to evaluate the long-term effects of the education.

Nurses’ attitudes regarding pain management became apparent in the results which were measured on the BWPKBQ questionnaire. The findings indicated nurses were willing to invest only minimal energy when managing the pain of suicidal patients as well as those diagnosed with a substance abuse disorder. Nurses also reported bias toward managing the pain of patients who were noncompliant with their medical regimen (Lewis et al., 2015). These findings reflected the research of Schreiber et al. (2014) and highlighted the ongoing issues with nurses’ attitudes in pain management. It was evident from researchers’ results that there were conflicting outcomes as to the reasons for increase in nurses’ knowledge and attitudes and also the methods in which these knowledge and attitudes could be improved.

Higher education levels have been presented as predictors of nurses’ knowledge and attitudes (Gretarsdottir et al., 2017; Keen et al., 2017; Lewthwaite et al., 2011; Yava et al., 2013). An educational programme for nurses, with an interdisciplinary approach, using simulated realistic situations to engage participants to improve nurses’ knowledge and attitudes has been used (Keen et al., 2017). Researchers have shown nurses’ knowledge and attitudes to be most effective immediately after an education session (McNamara et al., 2012) but equally effective six months after an education session (Jarrett et al., 2013). Also small group discussions significantly increased nurses mean knowledge scores, but attitudes to certain groups of patients still existed (Lewis et al., 2015). This assortment of educational interventions each have their own positive aspect to offer, but there did not appear to be any consistency as to a direction or way forward in improving nurses knowledge and attitudes to pain.

Furthermore, a disturbing finding from research by Rognstad et al. (2012) claimed a high rate of low self-reported competence among nurses, with regard to specific knowledge of nociceptive and neuropathic pain management. This finding was
concerning when taking into consideration the importance of effective postoperative pain management for patients. Rognstad et al. (2012) used a descriptive, cross-sectional survey to investigate attitudes, beliefs and self-reported competence with regard to pain management in 407 nurses and 128 physicians from 17 surgical wards in five hospitals in northern, central and southern Norway.

The majority of the nurses reported five years or more experience with postoperative pain management, however 5.4% of the nurses reported weak competence in nociceptive pain management, 26.7% nurses stated they had basic competence, 54.3% stated a competent understanding and only 13.3% described themselves as highly competent. Equally for reported competence of neuropathic pain, 38.1% of nurses reported a weak understanding, 42.3% reported basic understanding, and 13.8% reported being competent and only 1.8% reported being highly competent (Rognstad et al., 2012).

Caution must also be used when comparing the results of Latina et al. (2015), as the authors suggested their study results may have been due to the use of opioids in Italy for relieving pain being an issue that needed to be debated. Latina et al. (2015) argued the lack of adequate knowledge on assessing pain intensity among Italian healthcare professionals may have been a factor contributing to the general trend of low prescriptive appropriateness observed in their study.

Another finding from Keen et al. (2017) was the attitude of experienced staff in the unit while the education sessions were being held. The researchers noted that comments from the experienced staff were that they had already been through unit-specific pain education, indicating that they did not need to attend the current educational sessions. This may have indicated that the nurses with less experience may have had less exposure to pain education on the unit, which lead to more motivation to attend the education programmes. Similarly, it may have highlighted that these nurses had an inaccurate perception of their own pain management knowledge, which was an outstanding issue discovered by Vickers et al. (2014).
3.8 Nurses self-rating of pain knowledge

Vickers et al. (2014) established in their study that 75.5% of the participants indicated they had a good knowledge of pain management, despite the overall mean correct score on the survey being 65.7%. The participants had been asked to evaluate and identify their perceived level of knowledge in the area of pain management, and were presented with a rating scale ranging from ‘poor’ to ‘excellent’. None of the participants rated their level of knowledge as being either ‘poor’ or ‘fair’, 17% rating their knowledge as average, 75.5% of the participants rating their knowledge as being good, and 7.4% rating their knowledge as excellent. This finding raised concerns for Vickers et al. (2014) as they stated it seemed nurses were unaware of their lack of knowledge and poor attitudes regarding pain management.

3.9 Personal values

Bernhofer et al (2016) demonstrated how nurses were able to gain a new perspective on their pain management decisions, after education regarding how these decisions were related to their own personal values. The researchers invited eighty six RN’s to participate in their study, and to answer open-ended questions accessible via a link to REDcap. Data saturation was achieved after the 17th response and the authors concluded with a purposive sample of twenty RN’s, all of whom who had attended a recent full-day pain management class that included a segment on clinician values and decision making. Bernhofer et al. (2016) used rich qualitative data and four themes arose from the participants’ answers; these were understanding the patient, the importance of pain education, nurse’s self-awareness, and interpretation of personal values.

Bernhofer et al. (2016) hypothesized that the powerful influence of the personal values that each nurse brought to pain education classes could be an explanation for their being a disconnect between increasing pain management education and continued reports of poorly managed pain among hospitalized patients. This was earlier determined by Schreiber et al. (2014) and Brockopp et al. (2003).

Schreiber et al. (2014) evaluated their educational intervention to improve knowledge, assessment and attitudes of 341 nurses (203 pre-intervention and 138 post-intervention) related to pain. They concluded no statistically significant changes
in overall nurses’ knowledge or biases pre and post education, and determined these results of biases also reflected findings from previous research by Brockopp et al. (2003).

Bernhofer et al. (2016) stated that the nurses’ level of pain management knowledge was not the only influence in determining whether the patients receive better pain management, but it was also the nurses’ personal values that would contribute to their own decision-making behaviour regarding pain assessment and pain management. Therefore nurses need to have an understanding of the values that drive their own decision making practices, as this may then enable them to make effective decisions regarding pain assessment and treatment. Despite these findings from Bernhofer et al. (2016); Brockopp et al. (2003); Schreiber et al. (2014) that give further insight into nurses’ personal values that drive their decision making regarding patients’ pain management, researchers are still focussing on education content.

3.10 Nurses’ assessment of patients’ pain based on patient behaviours

Researchers have addressed nurses’ assessment on patient pain based on the nurses’ interpretation of the patients’ pain behaviour. This has been measured using the KASRP tool. The KASRP tool included two patient vignette questions regarding two comparable patients on their first day following abdominal surgery. The first question determines the nurses’ decisions with regard to pain assessment. The second question relates to the dose of analgesia the nurse would administer to the patient.

The two patients presented in the case studies were identical apart from their behaviour, with one patient smiling and the other was grimacing (Ferrell & McCaffery, 2014). The patient’s pain was assessed by the participant based on the use of an objective assessment tool called the numerical rating scale (NRS) with a scale of 0-10. Both of the patients in the case study rated their pain scores as 8 on the numerical rating scale of 0 to 10 and the participants were also asked to indicate their numerical assessment of the patients’ pain (Ferrell & McCaffery, 2014). This
question was designed to elicit any differences between the patients’ pain rating and the nurses’ pain rating, depending on the patients’ behaviour.

The principle of McCaffery’s adage ‘Pain is whatever the experiencing person says it is, existing whenever the experiencing person says it does’ (McCaffery, 1968, p. 95) was undermined in the responses attained by nurses in the case studies. The impact of nurses own clinical reasoning regarding pain behaviour and attitudes was demonstrated by a significant disparity between nurses’ assessment of the patients’ pain scores and the behaviour of the patient (Gretarsdottir et al., 2017; Vickers et al., 2014). The scores nurses rated for the patients reflected that nurses were more likely to believe the pain score of a grimacing patient (97.9%) as opposed to a smiling patient (69.9%) (Vickers et al., 2014). This was congruent with Gretarsdottir et al. (2017) who determined, of the 235 nurses (59% medical, 41% surgical) who responded to their survey, 82.1% agreed with the pain score of a grimacing patient, compared to 66% agreeing with the smiling patient.

These findings were not surprising as they were consistent with other researchers’ findings when using the KASRP tool to determine nurses’ knowledge and attitudes to pain. In the USA Moceri and Drevdahl (2014) reported only 44% of ninety one nurse study participants working in the ED provided the correct answer on the vignette case study question related to pain scale on the patient vignette. The author did not specify any differences of scores between nurses’ assessment of the grimacing patient compared to the smiling patient. Despite using the KASRP tool in their study, Latina et al. (2015) only specified that 15% of nurses scored the pain score lower than the patients’ self-report of pain; 6% indicated a different rating than the patient reported – 1% said the pain was higher than the patient rated, and 5% reported it lower. Therefore these results cannot be compared to other studies as Latina et al. (2015) have not specified which patient on the clinical vignette questions the results refer to.

Despite the pain experience being subjective and patient self-report being described as the most reliable for assessing patient’s pain, the following authors’ Vickers et al. (2014), Moceri and Drevdahl (2014), Gretarsdottir et al. (2017) findings indicated how the patients’ behaviour affected the respondents’ pain assessments and
consequently their decision making. This supported McNamara et al. (2012), who stated that nursing attitudes and beliefs regarding pain often lacked application of evidence and personal judgements influence nurses’ perception of patients’ pain experiences.

Demonstration of biases towards patients with non-physiological conditions and those patients whose pain experience was not immediately evident was observed by Schreiber et al. (2014). With nurses having a tendency to plan the management of the patients’ pain based on their own beliefs rather than on what the patient reports, especially when the patients’ behaviour did not meet the nurses’ expectations (Carr et al., 2014).

### 3.10.1 Nurses decisions regarding treatment choice/analgesic dose

The influence of the patients’ behaviour was observed to not only have an impact on the nurses’ assessment of the patients’ pain, but also the treatment choice the nurse made. The second question on the KASRP patient clinical vignette question requests the respondent to make a clinical decision relating to the choice of dose of analgesia the nurse would administer to the patient following their assessment of the patients’ pain score.

Not only did the nurses not agree with the patients’ pain scores but this also affected their decision making in the treatment of the patients’ pain, resulting in under treatment of pain. The inaccurate interpretation of the smiling patient, in terms of coexistence of pain, resulted in a significantly different decision to treat the patients’ pain. Even when the nurses correctly assessed the patients’ pain, some nurses elected to give a suboptimal dose or no analgesia at all. This signified their decisions were based on the patients’ outward signs of pain (Bach et al., 2018).

Vickers et al. (2014) found only 12.8% respondents answered correctly with regard to the dose of morphine which should be administered to the smiling patient. Whereas Brant et al. (2017) had slightly more favourable results of 39%, and Gretarsdottir et al. (2017) had the highest score of 48.9% respondents answered correctly to administering the correct dose of morphine to the smiling patient.
However, a low percentage of correct responses were also obtained for the respondents’ decision with regard to the patient who was grimacing. In Vickers et al. (2014) only 40.4% correctly answered they would administer the adequate dose of morphine to the patient who was grimacing, while Brant et al. (2017) found 58% and Gretarsdottir et al. (2017) found the largest correct responses at 67.7%.

The studies above demonstrate the nurses’ decisions to undertreat the patient’s pain based on the patient’s behaviour. Another reason to be considered regarding the nurses failing to administer the correct dose of morphine to the patient could be due to nurses concerns regarding the use of opioids (Ferreira et al, 2013) and fear of the patients developing addiction (Van Dijk et al, 2017).

In summary, the nurse’s assessment of the patient’s pain and consequently the treatment choice the nurse makes is influenced by the patients’ behaviour. In determining if the overall scores the nurses achieved, and consequently the level of knowledge the nurses have, the nurses in Vickers et al. (2014) study scored lowest in all three areas, administering morphine to the smiling patient (12.8%), the grimacing patient (40.4%) and overall total knowledge score (65.7%). Whereas nurses surveyed by Brant et al. (2017) had the highest knowledge score of 72%, despite not having the most correct answers out of the three studies for the smiling and grimacing patient out of the three studies.

Despite postoperative pain management being essential for the patient’s recovery it was evident from these researcher’s findings that there was a common theme of under-treatment of patients’ pain based solely on the patients’ behaviour. There could be various reasons to explain the nurses’ actions e.g. ignorance, lack of protocols, lack of education or attitudes or fear of opioid use causing addiction.

3.11 Predictors of nurses’ knowledge and attitudes

Researchers have collected demographic data in an attempt to ascertain predictors of nurses’ knowledge and attitudes. Analysis of the questions about opioid pharmacology and dosage demonstrated significant differences between groups for education level ( $P = 0.005$) with higher education levels weakly positively associated with correct answers (Moceri & Drevdahl, 2014). Respondents with
higher education levels, more years of nursing experience, and greater time in the ED selected the correct response more frequently. Interestingly, Moceri and Drevdahl (2014) found significant differences by education level, years of nursing experience, and years of nursing experience in a question about drug addiction/dependence.

The significance of higher education was identified in Gretarsdottir et al. (2017) study with participants who had an advanced degree gained on average 2.9% points higher scores compared to those without an advanced degree. Despite collecting demographics of their participants, Vickers et al. (2014) did not give any specific statistics relating to questions answered on the KASRP. Their largest group of participants was 56.4% aged between 20 – 30 years, with 69% of respondents having a degree in nursing.

Having more than five years of nursing experience, being a certified nurse, and receiving recent pain education in the last year were predictive of a higher score amongst participants in the Brant et al. (2017) study. The largest group by qualification were those with a Bachelors’ degree at 62%, 56% of nurses had over ten years’ experience as RN, and 63% had received pain education in the last year.

Latina et al. (2015) found a mean age of the respondents was 42.66 years, 40.2% were male, and 59.8% female. Highest level of education was 39.2% at Diploma level, largest age group was 35% at 41 – 50 years. Questions relating to attitudes and knowledge were addressed separately. There were no significant statistical association with attitudes related to age, sex, or level of education. However, results did confirm that nurses from the sub-intensive care units (SICUs) had a 62% higher probability for developing a positive attitude towards pain than health care professionals working in ordinary wards (OWs). Results also confirmed that nurses from the SICUs had a 76% higher probability of gaining a good understanding of pain related matters than health care professionals working in the OWs. This gave an indication that it was the environment or unit where the nurses were working that had an influence of the nurses’ knowledge and attitudes to pain.
3.12 The impact and influence the nurse’s knowledge and attitudes to pain has on the patient’s care, outcomes, experience and recovery

The identified factors that influence nurse’s knowledge and attitudes to pain have been varied, and can have different outcomes for the patient. Patients have shown dissatisfaction with their pain management and felt nurses did not do everything they could do to alleviate the patients’ pain (Hanna et al., 2012). With the authors concluding that the odds of patient satisfaction were 4.86 times greater if pain was controlled and 9.92 times greater if the patient considered the nurse’s attempts to relieve pain to be sufficient. This gives an indication that, even if the patient’s pain was not adequately controlled, the patient would be more satisfied if the nurse was responsive to the patient’s experience of pain.

This patient response was also described by Bozimowski (2012). Despite patients in their study reporting frustration with their pain management, feeling dismissed, disbelieved and placated about their pain, several patients described experiences of comfort when they felt the nurse truly listened and acknowledged their pain concerns. Additionally, patients reported higher levels of satisfaction when they received adequate teaching about their pain compared to those patients who felt they had received inadequate teaching (Bozimowski, 2012).

Of the two nursing units involved, patient satisfaction was lower in one unit than the other. The patients with the lower satisfaction scores were reported as most likely to have a surgical diagnosis and to be on one specific unit. These patients were also receiving intravenous analgesia as needed as opposed to oral analgesia (Bozimowski, 2012). They reported a higher last pain rating and were more likely to report that their education regarding pain management was inadequate (Bozimowski, 2012).

The reasoning for the above responses were questionable, whether it was the adequacy of the teaching the patients received from the nurses on the one particular unit or whether it was the type of therapy they had been administered. These responses could have been a consequence of the nurses’ knowledge and attitudes to the patients’ pain management. Despite these two studies being quite small, the
methods of research were qualitative which enabled the researchers to capture rich data.

Similarly, Tocher, Rodgers, Smith, Watt, and Dickson (2012) claimed 71.1% of patients definitely thought hospital staff did everything they could to help control their pain, despite 38.4% (596) reporting severe pain during their hospital stay. This was in response to a survey of 2269 post-surgical patients. The patients were asked to rate how severe their pain usually was during their hospital stay. This was not to be confused with pain at its worst or immediately after surgery when pain may be at its highest. Moderate pain was experienced by 52.1% (809) patients, and only 9.4% (145) patients reported having mild pain.

Furthermore, Tocher et al. (2012) claimed 26.3% (410) of the surgical patients had pain all or most of the time during their hospital stay, just over half reported having pain some of the time, and 22.8% (357) had pain only occasionally. Brant et al. (2017) found a strong correlation, in their study, between 216 RNs’ KASRP scores and patients’ satisfaction according to Hospital Consumer Assessment of Healthcare Providers (HCAHPS) scores. This suggests that the nurses’ increased knowledge about pain and better attitudes towards patients may influence overall patient satisfaction. However, some caution should be used when interpreting this result as the KASRP scores were correlated with the HCAHPS scores one year before and one year after the nurses were surveyed. However, staff may have changed during the two years in which the HCAHPS scores were analysed so patients’ satisfaction may have not been associated with the same staff that completed the surveys.

Interestingly Brant et al. (2017) also included in their demographic data survey, questions for nurses pertaining to the nurses own experiences of pain, with Brant et al. (2017) citing a lack of studies regarding nurses personal experiences of pain and its influence on pain knowledge and attitudes. These questions included whether the nurse lived with the experience of chronic pain, if they have had experienced episodes of moderate to severe pain, if they have had only rare or mild pain, or never had any pain. Also if a family member or close friend was in chronic pain, if the nurse had a substance abuse history, or if a family member or close friend had a substance abuse problem.
In contrast to the findings of Brant et al. (2017), a previous pilot study by Phillips, Gift, Gelot, Duong, and Tapp (2013) ascertained that the majority of the 88 patients they surveyed who received opioid analgesics at a 1018 bed acute care institution, were satisfied or very satisfied with their overall pain management, regardless of their pain intensity score. They determined no association between patients pain intensity score and patient satisfaction with overall pain management (Spearman’s rank correlation coefficient = −0.31; 95% confidence interval = −0.79 to 0.39).

These findings of patient satisfaction could be related to the nurse’s knowledge and attitudes. Nurses have a significant role in patients pain management, as Craig, Otani, and Herrmann (2015) discovered, in a survey of 31,106 patients across 32 hospitals in the USA, the most influential factor that influenced patients perceived pain control, between the nursing care, physicians care, staff care and the environment, was nursing care, no matter what the patients perceived level of pain control was.

Tocher et al. (2012) and Bozimowski (2012) highlight the pain experience and the patients’ perception of pain control are very important to the patients’ satisfaction. These findings suggest if there was an environment of care where the patient feels safe and acknowledged, and where the patient’s pain concerns were listened to, then the patient has increased satisfaction, even if the patient still had pain.

3.13 Chapter summary
Since the first exploration of knowledge and attitudes of doctors to pain by Marks and Sachar (1973), key influences and experiences that build pain knowledge and associated attitudes in the nursing workforce have been investigated. Over forty years on and nurses knowledge and attitudes to pain appear to have remained relatively the same.

Researchers have used various methods of research, and also assorted tools to determine nurses’ knowledge and attitudes to pain. The foundations of the nurses’ knowledge are drawn from a range of scientific, experiential, personal and professional knowledge. With nurses’ attitudes being shaped by the nurses’ own value system, cultural beliefs, social groups, religion, lived experiences, age, and
gender. Professional attitudes can be learned from the clinical environment, imitating other nurses, preceptorship, mentorship and nurses imitating their peers.

It has been postulated that nurses’ attitudes could account for concerns regarding the use of opioids for pain management, with deficits in the pharmacological knowledge of analgesia being discovered internationally in nursing. Additionally, deficits in education of pre-registration and post-registration nurses have been found, particularly related to knowledge and attitudes to pharmacology and questions related to opioids. Level of education has been proposed by researchers as an indicator of increased knowledge and attitudes to pain, and also rebuffed by others. Educational interventions have shown to have inconsistent results with regard to retention of knowledge and attitudes afterwards.

A high rate of low self-reported competence among nurses’ with regard to specific knowledge of nociceptive and neuropathic pain management has been reported, with nurses also showing an inaccurate perception of their pain management knowledge, and nurses even being unaware of their lack of knowledge and poor attitudes to pain management.

Despite the results of studies showing that nurses’ personal values drive their assessment and decision making regarding patients pain management, researchers are still focussing on education content. Disparities have been detected with researchers indicating nurses willing to invest minimal time with certain groups of patients, also showing bias towards patients with non-physical conditions, and nurses planning patients’ pain management based on their own beliefs rather than patient self-report. A common theme became apparent in the literature of nurses undertreating the patients’ pain based solely on patients’ behaviour.

In an attempt to ascertain predictors of nurse’ knowledge and attitudes to pain, researchers have compared participants’ demographic data against survey results. Significant differences has been demonstrated between education levels for answers regarding opioid pharmacology and dosage, (Moceri & Drevdahl, 2014), and overall knowledge scores (Gretarsdottir et al., 2017). With knowledge of drug addiction/dependence also associated with higher education levels, more years of
nursing experience, and more time working in the department (Moceri & Drevdahl, 2014). Whereas, Brant et al. (2017) reported receiving pain education in the last year was predictive of higher scores. With no significant statistical association with attitudes found related to age, sex, or level of education by Latina et al. (2015).

Place of work had an impact on scores achieved by Latina et al. (2015) with nurses on one unit scoring higher than the other unit, and also interestingly patient satisfaction was reported as being higher on the unit where nurses scored had increased knowledge. Patient satisfaction was found to be higher if patients felt the nurses were more responsive to their pain, even if the patient felt their pain was not relieved. Equally patients reported dissatisfaction if they felt nurses did not do everything to alleviate their pain or if the patient felt dismissed and not believed. Attitudes appeared to have an influence over having knowledge, despite all the research which has been devoted to measuring knowledge through education. It is evident that nurses need to be aware of their own attitudes in order to improve the patients’ pain experience.
4 Chapter four: Methodology and Methods

4.1 Introduction
This chapter describes the aims and purpose of the research study. A description is given of the methodology and methods used, including the rationale for the method chosen. The recruitment process, the setting, the sample used in the study, the inclusion and exclusion criteria and the sample size and characteristics are presented. The research design is presented with a description of the instrument used to collect the data, along with the modifications made to the tool, and the rationale for these changes. Data collection and analysis are discussed. Māori /cultural considerations are addressed, and finally the scope and limitations of the study are described.

4.2 Aim of the study
This study explored the knowledge and attitudes regarding pain, of RN’s involved in adult post-operative care across five DHB’s in the North Island of New Zealand.

4.3 Purpose
The purpose of this study was to establish baseline information in the New Zealand context of RN’s knowledge and attitudes to pain, which may inform future strategies to enhance pain knowledge and attitudes in this cohort. There have been various similar studies conducted internationally to measure nurse’s knowledge and attitudes to pain, however, this was the first study undertaken in New Zealand.

4.4 Methodology
Two broad paradigms underpin structured enquiry in nursing; Positivism and Constructivism. These relate to different approaches of developing evidence. The ontological position of positivism is one of realism, with an epistemology of objectivism, with the researcher being concerned with gaining knowledge in a world which is objective using scientific methods of enquiry such as experiments and surveys (Polit & Beck, 2017).

Conversely, the constructivist ontology underlies the qualitative approach to research. The researcher gathers rich, qualitative, in-depth information and the
findings are based on real life experience with subjective representations of objective reality being created (Polit & Beck, 2017).

The positivist paradigm has dominated nursing research since the 19\textsuperscript{th} century, guided by philosophers such as Mill, Newton and Locke (Polit & Beck, 2017). In positivist or scientific research, the positivist scientific method typically follows a systematic fashion and gathers data applying the quantitative method.

4.4.1 Quantitative method
The quantitative method is a systematic and objective process using orderly and disciplined procedures, with tight control on the research situation to minimise risk of bias. Data is collected using a formal measurement tool, given numerical values, tabulated and analysed statistically with the intention of answering the research question (Jirojwong, 2014).

Using the quantitative method, the researcher was able to gather objective data using an instrument which was an internationally validated survey tool. In an effort to recruit participants who represented the group of interest, tight control measures were imposed by using a strict inclusion and exclusion criteria. The survey was anonymous; therefore, the researcher could remain impartial, not being involved with the participants and being able to take a stance of objectivity.

To maintain consistency, the quantitative method was used to facilitate comparison with the research of Brant et al. (2017), Gretarsdottir et al. (2017), Keen et al. (2017), Moceri and Drevdahl (2014), Vickers et al. (2014). These international researchers utilised the same research instrument, however, methods of research varied.

Gretarsdottir et al. (2017), Moceri and Drevdahl (2014), and Vickers et al. (2014) used a cross sectional, descriptive, non-experimental survey research design. However, Gretarsdottir et al. (2017) added ‘don’t know’ alongside ‘yes’ and ‘no’ to the choice of answers for their participants. Their decision followed numerous recommendations from participants of an earlier pilot study, and their rationale was the potential to have a higher participation rate. Gretarsdottir et al. (2017) admitted
this was a limitation of their study, however they reported mean scores in their study were similar or higher than have been found in other studies, and therefore did not appear to affect their results. While Brant et al. (2017) employed a prospective, correlational design combined with a predictive model as they were also determining whether there was a relationship between KASRP and patient satisfaction scores. There was a minor tool adaptation to local context by the author of this study.

Hard copy surveys were used by Gretarsdottir et al. (2017), Moceri and Drevdahl (2014), and Vickers et al. (2014). Whereas the researcher in the current study used an online survey method. Brant et al. (2017) started their survey online but also gave their respondents the choice of receiving a hard copy survey. There was a risk when using hard copy surveys, of participants being able to access answers to the questions before returning the surveys. Therefore this needed to be considered when comparing the results of the current study which used an online survey, with other researcher’s results that used hard copy surveys.

A cross sectional, descriptive, non-experimental survey research design was used to explore nurse’s knowledge and attitudes to pain by using a modified version of the ‘Knowledge and Attitudes Survey Regarding Pain’ (KASRP) tool (Appendix 1). A cross sectional design signifies the data being collected from a chosen population at a specific point in time. This researcher chose the cross-sectional design which meant responses could be collected in one instance from the target population. The rationale was it was simple and quick to deliver, and had the ability to collect data from a potentially large number of respondents.

4.4.2 Descriptive design
Most quantitative research falls into two areas: studies that describe events and studies aimed at discovering causality. The descriptive design was used in this research as it aimed at describing the nursing population working in postoperative care, and not making any predictions or determining cause-and-effect as nothing was known yet about this topic in New Zealand. Descriptive studies are usually conducted when little is known about the topic under investigation. Despite this subject being researched internationally, as far as this researcher is aware, there has been no research of nurse knowledge and attitudes regarding pain carried out in New
Zealand. Therefore, the researcher could gather information to establish baseline knowledge for the New Zealand setting and add to international literature.

The rationale for this was to facilitate comparison against results from previous international studies by Brant et al. (2017), Gretarsdottir et al. (2017), Moceri and Drevdahl (2014) and Vickers et al. (2014). Some small changes were made to the original survey tool to suit the New Zealand context (see section 4.4.4). The demographic data collected in this study was comparable to the demographic data collected in other international studies.

Much of the published empirical literature that has investigated nurse’s knowledge and attitudes regarding pain has incorporated a similar cross-sectional descriptive research design (Gretarsdottir et al., 2017; Moceri & Drevdahl, 2014; Vickers et al., 2014). Choosing the same method so that findings from this study could be compared to similar international research studies will strengthen the potential for translation to practice.

**4.4.3 Instrument Selection**

Data were collected using an adapted version of the pre-validated ‘Knowledge and Attitudes Survey Regarding Pain’ (KASRP) tool (Ferrell & McCaffery, 2014). The authors of the tool published an open permission to use and adapt the tool (Appendix 2). The most recent version was 2014, which was used in this study. The tool consisted of 22 true or false questions, 15 multiple choice questions and two patient vignettes that required nurse’s decisions about pain assessment and interventions. The tool was free to use, and once set up online, limited resources were required.

The KASRP tool was well validated. Although not tested in NZ, reliability and validity have been tested internationally (Brant et al., 2017; Lewthwaite et al., 2011; McCaffery et al., 2000; Moceri & Drevdahl, 2014; Vickers et al., 2014; Yava et al., 2013) with some revision over the years to reflect changes in pain management practice.

The KASRP tool test-retest reliability was $r > 0.80$, and internal consistency reliability, $r = 0.70$. This was a measure of reliability obtained by administering the
same test twice over a period of time to a group of individuals. Scores were then correlated to evaluate the test for stability. It is the extent to which a measurement is free from measurement error. More broadly the extent to which scores for people who have not changed are the same for repeated measurements; statistically, the proportion of total variance in a set of scores that is attributable to true differences among those being measured. A quantitative index usually ranges in value from 0.00 to 1.00, which provided an estimate of how reliable an instrument is. The test-retest reliability of $r > 0.80$ and internal consistency reliability of $r = 0.70$ were considered satisfactory (Polit & Beck, 2018).

### 4.4.4 Instrument Modification

The KASRP tool being has been used to evaluate the knowledge and attitudes of nurses regarding pain in various settings. In this study, the tool was used with nurses working in postoperative settings.

For use in the New Zealand (NZ) context there were four questions that were modified.

- Question 16 refers to Vicodin which is not a drug used in NZ, therefore this was changed to a drug which has similar use called Oxycodone.

- Question 25 refers to meperidine which is the generic name for Pethidine. For the use of this questionnaire the name was changed to Pethidine as the generic name is used in NZ and registered nurses will not recognise the name meperidine.

- Question 30 relates to Hydromorphone, which is not used in NZ, therefore this was changed to Morphine which has a similar use profile.

- Question 32 was changed to reflect cultural considerations in NZ and not the United States of America. Answer choice a) will have the country “US” replaced with “NZ”. Answer choice b) will have examples changed from “Asians are stoic, Italians are expressive” to “Māori are stoic, Italians are expressive.”
The revised version for the NZ context was reviewed for face validity by two Clinical Nurse Specialists in Pain Management, and a Consultant Anaesthetist with an interest in Acute and Chronic Pain Management.

4.5 Setting
The setting for this study was postoperative care areas in five District Health Boards across the North Island of New Zealand.

4.6 Sample

4.6.1 Study Participants
The sampling frame or population of interest for the study was RN’s working in adult postoperative care. The sample represented the specific area of research focus and was a representation, with key characteristics of the target population, namely RN’s working in adult postoperative care in the North Island of New Zealand.

4.6.2 Recruitment
Key people were identified in each DHB, namely managers of the surgical departments, to disseminate invitation emails to the RN’s working in the postoperative areas. The invitation email contained the online link to the survey and an attachment of the Participant Information Sheet (Appendix 3). Consent information (Appendix 4) was included at the beginning of the survey for participants to read before they chose to commence the survey. On request, the managers reported back to this researcher, the number of invitation emails that were sent, which totalled 458. The number of responses returned was 128 (27.95%).

A follow up reminder was sent to the managers by way of email, one week after the initial invitation email, to ask the managers to send a reminder email to all the prospective participants who had been emailed the first time. In their study, Aerny-Perreten, Dominguez-Berjon, Esteban-Vasallo, and Garcia-Riolobos (2015) recommended the use of reminders as it increased their response rate from 22.6% to 32.9%, and then to 39.4%.

The researcher requested the email be delivered to the prospective participants within 48 hours of the managers receiving it from the researcher. This was to allow
the participants enough time to complete the survey before the two-week expiry date. One week after the initial invitation emails were disseminated, a follow up email was sent from this researcher to the managers to request they send a reminder email to the prospective participants.

### 4.6.3 Inclusion and Exclusion criteria

The inclusion and exclusion criteria were made clear to the participants in the Participation Information Sheet (Appendix 3) which was attached to the invitation email the participants received from their managers. To ensure tight control measures of subject appropriateness the following inclusion and exclusion criteria were applied:

**Inclusion criteria** – RN’s providing postoperative care to adults in the following clinical environments within five District Health Boards:

- Surgical wards
- Intensive Care Unit (ICU)
- High Dependency Unit (HDU)
- Post Anaesthetic Care Unit (PACU)

**Exclusion criteria**

- RN’s not working in post-surgical areas
- RN’s working in paediatric wards
- RN’s working in private hospitals
- Midwives

### 4.6.4 Power Analysis

To estimate sample sizes required to undertake the study the researcher consulted with a biostatistician from the University of Otago. A power analysis was performed
to estimate the sample size required for the study. Power analysis is a method used to strengthen statistical conclusion validity by estimating in advance how large a sample is needed. It was used to reduce the risk of Type II errors (Polit & Beck, 2017).

Type I and Type II errors occur when incorrect conclusions are made about the research study. A Type I error is a false-positive, when a relationship is found to exist between variables when it fact it does not. A Type II error is a false-negative, occurring when the researcher concludes that no relationship exists when in fact it does (Polit & Beck, 2017).

Nursing studies have shown to frequently contain Type II errors and the simplest way of reducing the risk of a Type II error is to increase the size of the sample. With an estimated 4300 Full Time Equivalent (FTE) RN’s working in the five district health boards included in this study, 30%-40% may work in surgical areas. A sample of approximately 300 participants was estimated by the biostatistician to be sufficient to estimate proportions to within a degree of statistical accuracy, no greater than ± 5.5%. Ongoing statistical consultation was undertaken as the study progressed (J. Williman, personal communication, 6th July, 2016).

This then gave an indication of the statistical power of the research design. The statistical power was the ability to detect true relationships among the variables. The independent variables were the demographic data collected and the dependent variable was the scores on the survey. If the sample was small then the statistical power may be low and the analyses may fail to show any relation between the independent and dependent variables, even when they exist (Polit & Beck, 2018).

A distribution of 1500 surveys was required to allow for 300 responses which had been calculated sufficient to gain statistical accuracy. This level of distribution was necessary to optimise the chance of a high response rate to construct statistical models, linear regression and binary predictors. The known response rate for web based surveys is known to be less than 20% (Aggar, Bloomfield, Stanton, Baynie, & Gordon, 2016; Hardigan, Succar, & Fleisher, 2012). The total number of surveys distributed were 458, which were far fewer than required.
Most nursing studies have modest (small to medium) effects (Polit & Beck, 2017), with the effect size being the significance of the relationship between the research variables. This effect size is estimated using available evidence and theory, however, there have been no earlier findings from this type of research in New Zealand, therefore in this case, researchers use conventions based on expectations of a small, medium or large effect.

This sample size was sufficient to construct statistical models to assess the impact of the listed exposures on the KASRP total score, and detect small to medium effect sizes. The effect size is a way of quantifying and emphasizing the difference between groups.

Sampling error can occur when using only a sample of the population, an explainable variation of this authors sample would be age, gender and ethnicity. Every attempt was taken to obtain an unbiased sample of the population by attempting to recruit an appropriate sample size from across a wide geographical area of New Zealand, and an appropriate selection of RN’s working only in postoperative areas.

4.7 Data collection

Study data were collected via the online KASRP survey. Demographic data were collected, specifically the following: Age, gender, years as a RN, and years of surgical nursing experience, hours worked per week, which DHB they work for, highest nursing qualification, ethnicity, and country of original nurse training (Appendix 5). In addition to the demographic data participants were asked to provide a self-evaluation at the start of the survey, of their level of knowledge related to pain (Appendix 6). This self-evaluation requested the participants to rate their level of knowledge as Excellent, Good, Average, Fair or Poor.

All survey data used for analysis were managed and automatically stored within the Research Electronic Data Capture (REDcap) programme. This is a secure web application hosted by the University of Otago and designed to support data capture for research studies, providing;
a) An interface for validated data entry,

b) Audit trails for tracking data manipulation and export procedures,

c) Automated export procedures for seamless data downloads to common statistical packages,

d) Procedures for importing data from external sources (Harris et al., 2009).

This programme separated the data from the participant’s email affording greater confidentiality as their identity cannot be linked, even by the researcher, with the participant’s individual response. The data will be destroyed after seven years as per the University requirements.

4.7.1 Data Analysis and processing

Data were analysed using the Statistical Package for the Social Sciences (SPSS) data analysis package. The total KASRP score was calculated for each participant, and summarised for the population. Individual questions were summarised to identify those most often answered correctly or incorrectly. Ferrell and McCaffery (2014) found it most helpful to avoid distinguishing items as measuring either knowledge or attitudes and that the most benefit to be gained was from analysing the data in terms of the percentage of complete scores as well as in analysing individual items (Appendix 4). Univariable differences in KASRP scores were compared using boxplot graphs for binary predictors and scatterplot graphs for continuous predictors.

Participant demographic, training and work characteristics were summarised using descriptive statistics. The results of the KASRP surveys were analysed by calculating overall scores for each participant and summarised for the population.

The percentage of correct answers on the KASRP was calculated by assigning a value of ‘1’ to each correctly answered item and a value of ‘0’ to each incorrectly answered item for each of the 41 individual items on the survey. Individual questions were also summarised to identify those most often answered correctly or incorrectly.
Two patient vignettes within the KASRP were also used to determine the RN’s ability to make decisions about pain assessment and interventions in two comparable patients on their first day following abdominal surgery. These responses received could be analysed against previous studies and comparison made against other results.

When calculating the demographic variables, the continuous variable was captured as whole numbers, and standardised questions were used as per New Zealand Census questions regarding ethnicity. Box plot graphs were used to compare scores for the binary predictors to show the distribution of KASRP scores. The average scores were then calculated to ascertain the difference between the groups.

These two methods were used to assess the impact of the exposures, which were predictor variables, the demographics of the sample, being: years as a RN, years’ of surgical experience, hours worked per week, highest nursing qualification, country of original nurse training.

4.8 Ethical Considerations

Ethical approval for this research was sought and granted by Otago University Ethics Committee on 13th December 2016, reference number H16/133 (Appendix 7). Locality approval to undertake the study was also obtained from each of the five DHB’s involved.

Ethics in research is described as a system of moral values that is concerned with the degree to which research procedures adhere to professional, legal and social obligations to the study participants (Polit & Beck, 2017). This research study involved humans as study participants; therefore, every care was taken to ensure their rights were protected. One of the researcher’s responsibilities was to be aware of the consequences of the research, intended and non-intended.

There are ethical values that are fundamental in nursing practise. Among these is nonmaleficence (doing no harm), beneficence (doing good), autonomy (self-determination) and justice (Polit & Beck, 2017). These are also the mainstay of upholding ethics in both healthcare delivery and research.
The formulation of the study and methodological approach chosen by this researcher was specifically designed to protect the participants and ensure nonmaleficence. The researcher is a Specialist Clinical Nurse and educator in pain management at one of the participating DHB’s. The power inherent in the role of this researcher may have caused participants to feel threatened if questioned directly about their knowledge and attitudes to pain. This was a valid reason for using the quantitative survey, affording the participants anonymity.

Nonetheless, the participants may have felt under pressure to partake in the study due to the email being delivered by their managers. To uphold nonmaleficence, a phone call was made from the researcher to the managers before the study. A clear explanation was given regarding the necessity to circulate the study invitation without applying any influence for the nurses to participate.

Confidentiality and anonymity are closely connected with beneficence. To establish beneficence in this study, a third party, namely the respective managers of the surgical departments, were requested to disseminate the invitation emails to prospective participants on behalf of this researcher. This provided a layer of separation between this researcher and the participants.

The Participant Information Sheet contained the aim of the study to determine RN’s who work in postoperative care, knowledge and attitudes regarding pain. The anticipated benefits from the study were also outlined. The study being the first carried out in NZ, which may inform nursing education strategies. Also noted was the relationship between study aims and improved patient outcomes.

Confidentiality was highlighted in the Participant Information Sheet and assurance given to participants that their identity would not be linked, even by this researcher, with his/her individual response. Also, an assurance was included for the participants, that if they participated, they were not under obligation to complete the survey.

The inclusion and exclusion criterion were also made clear, with explanation of what was required from the participants. This allowed the participants autonomy to freely
decide to participate without fear of coercion, nor being offered rewards, and in the full knowledge of what was being investigated. This researcher was also conscious of participant safety and anonymity with regard to participants’ ethnicity. Therefore, discussion of ethnicity in the results was dependent on sufficient numbers to maintain anonymity.

4.8.1 Consent

Autonomy was respected and participants were made explicitly aware that consent was for this study only. After reading the consent information at the start of the survey, consent was implied by proceeding to complete the survey. As RN’s, the participants were deemed competent to give consent, as they are professional nurses and qualified as RN’s. The consent information provided highlighted their right to ask questions, and decline to give information. The participants were able to withdraw from the study up until the time they had submitted the responses to the survey. As the survey was anonymous it was not possible to determine who the data belonged to, so it was not possible to withdraw an individual’s response after submission.

This researcher was aware that this testing of nurse’s knowledge and attitudes to pain may raise questions regarding the nurses’ capabilities if they feel they performed poorly in the survey. To ensure appropriate support was given to the nurses, an online link to the Australian and New Zealand College of Anaesthetists (Australian and New Zealand College of Anaesthetists, 2016) website was made available at the end of the survey. This website contains links to appropriate electronic information resources, and up to date books about acute pain management.

The contact details for the Principal investigator and the Master’s student conducting the research were included in the Participant Information Sheet. Also included were the contact details for the University of Otago Human Ethics Committee.

The information and data gathered from the study was safely managed, with password protection to the programme. Any data used for analysis was automatically
stored within the REDcap programme (Secure server) and a plan set in place to be destroyed after seven years as per the University requirements.

4.8.2 Cultural/Māori Considerations
Consultation took place with Marama Tauranga, Māori Advisor, Regional Health Services, and Bay of Plenty District Health Board, where this researcher works. A summary of the main findings of the research was requested on completion, which can then be shared with members of Te Tumu Whakahaere (National DHB Māori Health Managers Collective).

Māori consultation also took place with Karen Keelan, Māori Research Advisor, University of Otago and feedback and recommendations were given on 1/11/2016 (Appendix 8). Her recommendation was that a 15% response rate from Māori within each DHB would provide a representation of the Māori population in NZ.

There were 3565 practising RN’s who identified as Māori on the New Zealand Nursing Council register at 31st March 2017. This represented 7% of the total RN nursing workforce. The Māori nursing workforce is primarily concentrated in the Upper North Island, with a total of 28.1% represented in the five DHB’s surveyed (Nursing Council of New Zealand, 2018). This study had the advantage of capturing areas with a primary concentration of the Māori nursing workforce. Appropriate ethnicity data was collected from the subjects in accordance with the Ministry of Health guidelines (Ministry of Health, 2013). This researcher was conscious of participant safety and anonymity, therefore, discussion of ethnicity in the results was dependent on sufficient numbers to maintain anonymity.

4.8.3 Scope and Limitations
The motivation to undertake this study began with this researcher’s interest in pain management. To manage potential bias, this researcher ensured the study was as rigorous as possible, and acknowledged any limitations.

Hardigan et al. (2012) determined web based surveys as being 2.68 times more cost effective than mail delivered surveys. The research project was not funded; therefore, the web based survey method allowed multiple DHB’s to be included in
the survey without any cost to the researcher. A limitation of using this survey was that it was made up of multi choice question, and yes/no answers. This limited the ability of the researcher to gain any unique insights or opinions from the participants; however, it established a baseline in an area that has not been researched in NZ before. This quantitative method of closed questions focused solely on outcomes, and not the experiences of the participants to meet those outcomes.

There was a risk of selection bias being introduced by an incomplete mailing list or sampling frame being used. This risk was determined as being quite small. Conversely, potential non-response from a sub-set of potential participants could have afforded a greater risk of bias. This was limited by ensuring the response rate was as high as possible with reminder emails sent from managers of the departments to potential participants.

Historically web based surveys have been shown to generate a low response rate. A low response rate could reduce the effective sample size and affect the validity of the study. As demonstrated in their Australian online survey of 707 health professionals which included two reminder emails, Manias (2015) achieved a 14% response. Similarly, Aggar et al. (2016) obtained a 13.4% response with an online survey of Practice Managers in Australia; however, they did not send any follow up emails. In a USA online survey of periodontal resident doctors, which also included two follow up emails, Mawardi, Fateh, Elbadawi, and Karimbux (2015) achieved a 19.1% response rate. For the current study, after consultation with a biostatistician, this researcher deemed 300 responses to be an adequate sample size.

To enhance the representativeness of the sample in terms of recruiting enough RN’s working in postoperative care, multiple DHB’s were used. Even though larger numbers could be studied, the sample was limited to the Midland Region of the North Island, which may have been a limitation as results were not indicative of the knowledge and attitudes of RN’s working in postoperative care throughout the country.
To facilitate a high response rate, the relevance of the research project was highlighted in the aims section of the Participant Information Sheet, which accompanied the invitation email to potential participants. Furthermore, buy in from the ward managers to present the study was gained by personal communication by telephone from this researcher, to send out the invitations to participate.

4.9 Chapter Summary

The aim of this study was to explore the knowledge and attitudes regarding pain, of RN’s involved in adult post-operative care across five DHB’s in the North Island of New Zealand. The purpose was to establish some baseline information in the New Zealand context of RN’s knowledge and attitudes to pain, which may inform future strategies to develop pain knowledge and attitudes in this cohort.

A cross sectional, descriptive survey research design was used to explore nurse’s knowledge and attitudes to pain by using a modified version of the ‘Knowledge and Attitudes Survey Regarding Pain’ (KASRP) tool. Although, a well validated tool, with reliability and validity being tested internationally, it has not been tested in New Zealand. The most recent, 2014 version of the tool was used. It consisted of 22 true or false questions, 15 multiple choice questions and two patient vignettes that required nurse’s decisions about pain management and interventions. For use in the New Zealand context four of the questions were modified, then reviewed for face validity by two Clinical Nurse Specialists in Pain Management, and an Anaesthetic Consultant with an interest in Acute and Chronic Pain Management.

Study data were collected via the online KASRP survey and were managed using the secure web application REDcap tool, hosted at the University of Otago. The setting was postoperative care areas in five District Health Boards across the North Island of New Zealand and the population of interest for the study was RN’s working in adult postoperative care.

Key people in each DHB disseminated the invitation emails to RN’s and were also asked to send a reminder email one week later. The invitation email contained an online link to the survey, Participant Information sheet and consent information. Demographic data were collected from the participants, and also a self-evaluation of
the participants’ level of knowledge related to pain. To ensure tight control measures of subject appropriateness an inclusion and exclusion criteria was also applied. A biostatistician from the University of Otago was consulted and estimated a sample size of approximately 300 participants to be sufficient to estimate proportions to within a degree of statistical accuracy, no greater than ± 5.5. %.

Data were analysed using the Statistical Package for the Social Sciences (SPSS) data analysis package. The total KASRP score was calculated for each participant, and summarised for the population. Individual questions were summarised to identify those most often answered correctly or incorrectly. Univariable differences in KASRP scores were compared using boxplot graphs for binary predictors and scatterplot graphs for continuous predictors. Participant demographic, training and work characteristics were summarised using descriptive statistics. The results of the KASRP surveys were analysed by calculating overall scores for each participant and summarised for the population.

Ethical approval for this research was sought and granted by Otago University Ethics Committee on 13th December 2016. Locality approval to undertake the study was also obtained from each of the five DHB’s involved.

Participants were made explicitly aware that consent was for this study only and consent was implied by proceeding to complete the survey. The consent information provided highlighted their right to ask questions, and refuse to give information.

Consultation was undertaken with the Māori Advisor, Regional Health Services, and Bay of Plenty District Health Board with a summary of the main research findings being requested on completion, to be shared with members of Te Tumu Whakahaere (National DHB Māori Health Managers Collective).

A limitation of the survey was determined to it being a web based survey. Despite it being cost effective to use, the survey only contained closed questions which prevented the researcher from gaining any unique insights or opinions from the participants. The results of the surveys will be discussed in the following chapter.
5 Chapter five: Results

5.1 Introduction

This chapter presents the results from the KASRP surveys which were distributed to five DHB’s within the North Island of New Zealand. The questions and responses from the KASRP survey will be presented by percentages in three separate tables. Those are items receiving more than 80% correct response rate, items receiving between 50% - 80% correct response rate and items receiving less than 50% correct response rate.

The number of surveys distributed to the five DHB’s, responses received, response rate per DHB and percentage of total responses received will be presented in table form. The DHB names have been removed to maintain confidentiality of participants. Descriptive statistics for the main demographic variables; age, gender, years as RN, years of surgical experience as a RN, hours worked per week, highest qualification and self-evaluation of level of knowledge will be presented in table form.

Scatterplot graphs demonstrate total scores against respondents’ years as RN, years of surgical experience and hours worked per week. Boxplot graphs present total percentages by highest qualification, self-evaluation of level of knowledge, and total scores by country of original nurse training.

5.1.1 Total scores achieved on KASRP

The KASRP survey had a maximum raw score achievable of 41, which would equate to a 100% correct response. The KASRP score was calculated for each participant and summarised for the sample, giving a total percentage of correct answers as 73.1%. A score of 80% or over was achieved by 30 participants (41.7%). Four hundred and fifty-eight KASRP surveys were distributed, and one hundred and twenty-eight RN’s participated, making a response rate of 27.95%. Of these, there were 84 (65.6%) completed surveys and 44 (34.4%) incomplete. The main demographic data are presented in Table 1 below.
Table 1 Demographic data

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>113</td>
<td>21</td>
<td>68</td>
<td>42.33</td>
<td>11.687</td>
</tr>
<tr>
<td>Gender</td>
<td>114</td>
<td>1</td>
<td>2</td>
<td>1.94</td>
<td>.241</td>
</tr>
<tr>
<td>Years as RN</td>
<td>114</td>
<td>1</td>
<td>43</td>
<td>16.90</td>
<td>11.457</td>
</tr>
<tr>
<td>Years of Surgical Experience</td>
<td>114</td>
<td>1</td>
<td>38</td>
<td>12.68</td>
<td>9.028</td>
</tr>
<tr>
<td>Hours worked per week</td>
<td>114</td>
<td>16</td>
<td>40</td>
<td>33.14</td>
<td>6.491</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>111</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.1.2 Response rate

The response rate for this study was 27.95%, which was higher than response rates from other web based surveys of Aggar et al. (2016) at 13.4% and Hardigan et al. (2012) at 11%. It was also higher than Moceri and Drevdahl (2014) at 25% who used a mixture of an online survey method as well as paper format surveys.

Aggar et al. (2016) online survey was aimed at nurse practice managers and achieved a 13.4% response rate, while Hardigan et al. (2012) surveyed practising dentists and offered a choice of completing a paper or online survey. Hardigan et al. (2012) achieved an 11% response rate and concluded that, given the choice, the dentists in their survey were fifteen times more likely to complete a paper survey than to complete an online survey. They attributed the reason for this, in part to be due to familiarity and ease of using the internet influenced the participants’ likelihood of preferring an online questionnaire.

However, the current study had a much lower response rate than Brant et al. (2017) at 44%, who also used online and paper format surveys. Using an online survey method Gretarsdottir et al. (2017) achieved a 51% response rate. Vickers et al. (2014) did not indicate their method of distribution for their survey but achieved a 52.2% response rate, and Duke et al. (2013) used paper format for their survey with 62% response rate.

In an attempt to ensure a higher response rate in this study, a reminder email was sent to the surgical managers of the participating hospitals two weeks after the initial survey, to remind nurses about the survey. The rationale for this was that response
rates have been shown to increase after reminders have been sent to participants (Aerny-Perreten et al., 2015; Cho, Johnson, & Vangeest, 2013). Despite using this strategy, a response of 84 completed surveys was received, compared to the recommended number of 300 by the biostatistician.

5.1.3 Total scores achieved on KASRP
Table 2 below presents the item number of the KASRP question, the number it is ranked, the KASRP question, the total number of correct answers against possible total answers, and percentage of correct answers.

The first section shows the items which received more than an 80% correct response rate. Items receiving 50% - 80% correct response rate are presented in the second section. The items receiving less than 50% correct response rate are presented in the third section.

<table>
<thead>
<tr>
<th>Item number</th>
<th>Rank</th>
<th>Question/Answer</th>
<th>N/Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1</td>
<td>Elderly patients cannot tolerate opioids for pain relief – <strong>False</strong></td>
<td>98/98</td>
<td>100%</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>Patients should be encouraged to endure as much pain as possible before using an opioid – <strong>False</strong></td>
<td>96/96</td>
<td>100%</td>
</tr>
<tr>
<td>29</td>
<td>3</td>
<td>The most likely reason a patient with pain would request increased doses of pain medication – <strong>The patient is experiencing increased pain</strong></td>
<td>88/88</td>
<td>100%</td>
</tr>
<tr>
<td>12</td>
<td>4</td>
<td>Children less than 11 years old cannot reliably report pain so clinicians should rely solely on the parent’s assessment of the child’s pain intensity – <strong>False</strong></td>
<td>94/96</td>
<td>97.9%</td>
</tr>
<tr>
<td>31</td>
<td>5</td>
<td>The most accurate judge of the intensity of the patient’s pain is – <strong>The patient</strong></td>
<td>85/87</td>
<td>97.7%</td>
</tr>
<tr>
<td>24</td>
<td>6</td>
<td>The recommended route of administration of</td>
<td>86/89</td>
<td>96.6%</td>
</tr>
<tr>
<td>Item number</td>
<td>Rank</td>
<td>Question/Answer</td>
<td>N/ Total</td>
<td>%</td>
</tr>
<tr>
<td>------------</td>
<td>------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>opioid analgesics for patients with brief, severe pain of sudden onset such as trauma or postoperative pain is – Intravenous</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>Combining analgesics that work by different mechanisms (e.g. combining an NSAID with an opioid) may result in better pain control with fewer side effects than using a single analgesic agent – True</td>
<td>94/98</td>
<td>95.9%</td>
</tr>
<tr>
<td>14</td>
<td>8</td>
<td>After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient’s response – True</td>
<td>92/96</td>
<td>95.8%</td>
</tr>
<tr>
<td>25</td>
<td>9</td>
<td>Which of the following analgesic medications is considered the drug of choice for the treatment of prolonged moderate to severe pain for cancer patients? – Morphine</td>
<td>85/89</td>
<td>95.8%</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
<td>Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real. – False</td>
<td>91/96</td>
<td>94.8%</td>
</tr>
<tr>
<td>22</td>
<td>11</td>
<td>Sedation assessment is recommended during opioid pain management because excessive sedation precedes opioid-induced respiratory depression – True</td>
<td>89/94</td>
<td>94.7%</td>
</tr>
<tr>
<td>13</td>
<td>12</td>
<td>Patients spiritual beliefs may lead them to think pain and suffering are necessary – True</td>
<td>90/95</td>
<td>94.7%</td>
</tr>
<tr>
<td>32</td>
<td>13</td>
<td>Which of the following describes the best approach for cultural considerations in caring for patients in pain: Patients should be individually assessed to determine cultural influences</td>
<td>82/87</td>
<td>94.3%</td>
</tr>
<tr>
<td>20</td>
<td>14</td>
<td>Narcotic/ opioid addiction is defined as a chronic neurobiological disease, characterized by behaviours that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving – True</td>
<td>86/94</td>
<td>91.5%</td>
</tr>
<tr>
<td>18</td>
<td>15</td>
<td>Anticonvulsant drugs such as gabapentin (Neurontin) produce optimal pain relief after a single dose – False</td>
<td>86/96</td>
<td>89.6%</td>
</tr>
</tbody>
</table>
Robert is 25 years old and this is his first day following abdominal surgery. As you enter his room, he is lying quietly in bed and grimaces as he turns in bed. Your assessment reveals the following information: BP 120/80; HR 80; Resps 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8. a) On the patients record you must mark his pain on the scale below. Check the number that represents your assessment of Roberts pain – **Answer 8**

The term ‘equianalgesia’ means approximately equal analgesia and is used when referring to the doses of various analgesics that provide approximately the same amount of pain relief – **True**

The time to peak effect for morphine given IV is – **15 mins**

Opioids should not be used in patients with a history of substance abuse – **False**

Vital signs are always reliable indicators of the intensity of a patient’s pain – **False**

---

**Items receiving between 50% - 80% correct response rate**

<table>
<thead>
<tr>
<th>Item number</th>
<th>Rank</th>
<th>Question/Answer</th>
<th>N/ Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>21</td>
<td>The usual duration of analgesia of 1-2mg morphine IV is 4-5 hours – <strong>False</strong></td>
<td>78/98</td>
<td>79.6%</td>
</tr>
<tr>
<td>17</td>
<td>24</td>
<td>If the source of the patient’s pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain – <strong>False</strong></td>
<td>70/96</td>
<td>72.9%</td>
</tr>
<tr>
<td>30</td>
<td>25</td>
<td>Which of the following is useful for treatment of cancer pain? – <strong>All of the above</strong></td>
<td>63/88</td>
<td>71.6%</td>
</tr>
<tr>
<td>Item number</td>
<td>Rank</td>
<td>Question/Answer</td>
<td>N/Total</td>
<td>%</td>
</tr>
<tr>
<td>-------------</td>
<td>------</td>
<td>---------------------------------------------------------------------------------</td>
<td>---------</td>
<td>----</td>
</tr>
<tr>
<td>16</td>
<td>28</td>
<td>Oxycodone 5mg PO is approximately equal to 5-10mg of morphine PO - <strong>True</strong></td>
<td>66/96</td>
<td>68.8%</td>
</tr>
<tr>
<td>26</td>
<td>29</td>
<td>A 30mg dose of oral morphine is approximately equivalent to – <strong>10mg IV</strong></td>
<td>57/87</td>
<td>65.5%</td>
</tr>
<tr>
<td>27</td>
<td>30</td>
<td>Analgesics for post-operative pain should initially be given – <strong>Around the clock on a fixed schedule</strong></td>
<td>55/87</td>
<td>63.2%</td>
</tr>
<tr>
<td>37</td>
<td>31</td>
<td>Which statement is true regarding opioid induced respiratory depression? – <strong>Obstructive sleep apnoea is an important risk factor</strong></td>
<td>55/87</td>
<td>63.2%</td>
</tr>
<tr>
<td>6</td>
<td>32</td>
<td>Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months – <strong>True</strong></td>
<td>59/97</td>
<td>60.8%</td>
</tr>
<tr>
<td>4</td>
<td>33</td>
<td>Patients may sleep in spite of severe pain – <strong>True</strong></td>
<td>58/98</td>
<td>59.2%</td>
</tr>
</tbody>
</table>

**Items receiving less than 50% correct response rate**

<table>
<thead>
<tr>
<th>Item number</th>
<th>Rank</th>
<th>Question/Answer</th>
<th>N/Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>34</td>
<td>How likely is it that patients’ who develop pain already have an alcohol and/or drug abuse problem? – <strong>5-15%</strong></td>
<td>35/87</td>
<td>40.2%</td>
</tr>
<tr>
<td>35</td>
<td>35</td>
<td>The time to peak effect for morphine given orally is – <strong>1–2 hours</strong></td>
<td>35/88</td>
<td>39.8%</td>
</tr>
<tr>
<td>5</td>
<td>36</td>
<td>Aspirin and other non-steroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases – <strong>False</strong></td>
<td>38/96</td>
<td>39.6%</td>
</tr>
<tr>
<td>23</td>
<td>37</td>
<td>The recommended route of administration of opioid analgesics for patients with persistent cancer-related pain is – <strong>Oral</strong></td>
<td>30/89</td>
<td>33.7%</td>
</tr>
<tr>
<td>36</td>
<td>38</td>
<td>Following abrupt discontinuation of an opioid, physical dependence is manifested by the following – <strong>Sweating, yawning, diarrhoea and agitation when the opioid is abruptly</strong></td>
<td>28/88</td>
<td>31.8%</td>
</tr>
<tr>
<td>Item number</td>
<td>Rank</td>
<td>Question/Answer</td>
<td>N/ Total</td>
<td>%</td>
</tr>
<tr>
<td>-------------</td>
<td>------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------</td>
<td>-----</td>
</tr>
<tr>
<td>41</td>
<td>39</td>
<td>(Robert, quiet and grimacing, rates his pain as 8/10). Your assessment of Robert is made two hours after he received morphine 2mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physicians order for analgesia is ‘morphine IV 1-3mg q1hr pain relief.’ Check the action you will take at this time – <strong>Administer morphine 3mg IV now.</strong></td>
<td>24/82</td>
<td>29.3%</td>
</tr>
<tr>
<td>39</td>
<td>40</td>
<td>(Andrew, talking and joking, rates his pain as 8/10). Your assessment of Andrew is made two hours after he received morphine 2mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physicians order for analgesia is ‘morphine IV 1-3mg q1hr pain relief.’ Check the action you will take at this time – <strong>Administer morphine 3mg IV now.</strong></td>
<td>11/87</td>
<td>12.6%</td>
</tr>
<tr>
<td>28</td>
<td>41</td>
<td>A patient with persistent cancer pain has been receiving daily opioid analgesics for 2 months. Yesterday the patient was receiving morphine 200mg/hr intravenously. Today he has been receiving 250mg/hr intravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of new comorbidity is – <strong>Less than 1%</strong></td>
<td>10/85</td>
<td>11.8%</td>
</tr>
</tbody>
</table>

5.1.4 **Responses and DHB numbers**

The five DHB’s have been numbered from one to five to ensure confidentiality of participants. There were variations in the number of responses across the DHB’s, therefore KASRP responses were not analysed separately.
At DHB one there were 244 surveys distributed and 71 respondents (29.1%). One hundred and seventeen surveys were distributed in DHB two with a total response of 18 (15.38%). Seventy-seven surveys were distributed in DHB three, and a total of 17 (22.08%) were returned. Fifteen surveys were distributed in DHB four, with a response of six (40%), and five distributed in DHB five, with a response of three (60%). Thirteen incomplete responses were not included in the data. See table 3 below.

Table 3 Responses/DHB's

<table>
<thead>
<tr>
<th>DHB number</th>
<th>Number of Surveys Distributed</th>
<th>Number of Responses Received</th>
<th>Response rate per DHB</th>
<th>Percentage of Total Responses Received</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>244</td>
<td>71</td>
<td>29.1%</td>
<td>61.7%</td>
</tr>
<tr>
<td>Two</td>
<td>117</td>
<td>18</td>
<td>15.38%</td>
<td>15.7%</td>
</tr>
<tr>
<td>Three</td>
<td>77</td>
<td>17</td>
<td>22.08%</td>
<td>14.8%</td>
</tr>
<tr>
<td>Four</td>
<td>15</td>
<td>6</td>
<td>40.0%</td>
<td>5.2%</td>
</tr>
<tr>
<td>Five</td>
<td>5</td>
<td>3</td>
<td>60.0%</td>
<td>2.6%</td>
</tr>
<tr>
<td>Total</td>
<td>458</td>
<td>115 a</td>
<td>60.0%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Incomplete data n = 13

5.1.5 Gender of Participants

The genders of participants in this study were seven (6.1%) male and 107 (93.9%) female. These results are presented in the table below. Fourteen incomplete responses were not included in the data. See table 4 below.

Table 4 Gender

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>107</td>
<td>93.9%</td>
</tr>
<tr>
<td>Male</td>
<td>7</td>
<td>6.1%</td>
</tr>
<tr>
<td>Total</td>
<td>114 a</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Incomplete data n = 14
5.1.6 Ages of participants

Participants were asked to state their age in years. The age range was 21 years to 68 years with a mean of 42.33 years. The mean age of female RN’s in this study was 42.29 years and the mean age of male RN’s being 42.86 years. The largest age group of the participants was 41-50 years (33.6%), and the smallest age group was 61-70 years (4.4%). Fifteen incomplete responses were not included in the data. These figures are presented in table 5 below.

This closely aligns with the NCNZ figures as at 31st March 2017, with the mean age of all RN’s being 45.5 years (median of 46). The mean age of female RN’s being 45.8 (median of 47) and the mean age of male RN’s being 42.5 (median of 41). Of the 49,933 practising RN’s on the NCNZ register as at 31st March 2017, 91% were female, with 43% aged 50 or above (Nursing Council of New Zealand, 2018).

Table 5 Age groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 – 30</td>
<td>24</td>
<td>21.2%</td>
</tr>
<tr>
<td>31 – 40</td>
<td>21</td>
<td>18.7%</td>
</tr>
<tr>
<td>41 – 50</td>
<td>38</td>
<td>33.6%</td>
</tr>
<tr>
<td>51 – 60</td>
<td>25</td>
<td>22.1%</td>
</tr>
<tr>
<td>61 – 70</td>
<td>5</td>
<td>4.4%</td>
</tr>
<tr>
<td>Total</td>
<td>113*</td>
<td>100%</td>
</tr>
</tbody>
</table>

* Incomplete data n = 15

The bivariate data sets of total scores achieved on the KASRP, and ages of the participants are presented in Figure 1 below. A total score of 41 would equate to 100%, a score of 33 would equate to 80% and 21 would equate 50%. It was evident the points do not have any linear trend, therefore there is zero correlation between the scores achieved and the ages of the respondents. A correlation coefficient to measure the strength of the linear relationship between the two variables also showed no significance, r = .190. See Figure 1 below.
5.1.7 Years as a Registered Nurse

Participants were asked to state how many years they had been qualified as a RN. Twenty-two point one percent of the respondents had been practising as an RN for 0 – 5 years, with 17.7% for 6 – 10 years. The largest group by far was 60.8% of nurses being a RN for ten years or more.

According to the NCNZ as of 31\textsuperscript{st} March 2017, of the 98% nurses who renewed their Annual Practising Certificate, and stated how long they had been practising as a nurse, 20% had been practising for 0 – 5 years, 16% for 6 – 10 years, 11% for 11 – 15 years and 53% for more than 15 years (Nursing Council of New Zealand, 2018). This indicates that the population of this study are representative of the nursing population in NZ. Table 6 below presents the frequency and percentage of scores and years as a RN. Fourteen incomplete responses were not included in the data.
Table 6 Number of years as a Registered Nurse

<table>
<thead>
<tr>
<th>Years as a Registered Nurse:</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 year</td>
<td>1</td>
<td>0.9%</td>
</tr>
<tr>
<td>1 – 5 years</td>
<td>24</td>
<td>21.2%</td>
</tr>
<tr>
<td>6 – 10 years</td>
<td>20</td>
<td>17.7%</td>
</tr>
<tr>
<td>11 – 15 years</td>
<td>12</td>
<td>10.5%</td>
</tr>
<tr>
<td>16 – 20 years</td>
<td>17</td>
<td>14.9%</td>
</tr>
<tr>
<td>21 – 30 years</td>
<td>24</td>
<td>21.1%</td>
</tr>
<tr>
<td>31 years and above</td>
<td>16</td>
<td>14.3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>114</strong></td>
<td></td>
</tr>
</tbody>
</table>

ᵃ Incomplete data n = 14

The bivariate data sets of total scores achieved on the KASRP, and the number of years participants have been RN are presented in Figure 2 below. It is evident the points do not have any linear trend, therefore there was no correlation between the scores achieved and the number of years respondents had been RN’s. A correlation coefficient to measure the strength of the linear relationship between the two variables also showed no significance, r = .179.

Figure 2 Total KASRP scores and years as Registered Nurse
5.1.8 Years of surgical experience as a Registered Nurse

Participants were asked to state how many years of surgical experience they had as a RN. The mean number of years of surgical experience was 12.68, with a median of 10 years, and standard deviation of 9.04 years, and range of 38.

Twenty eight point one percent of the participants had five years or less surgical experience, with 24.6% having 6 – 10 years surgical experience and the largest group was 47.6% having ten years or more experience.

Table 7 below presents the frequency and percentage of years of surgical experience as a RN. Fourteen incomplete responses were not included in the data.

Table 7 Number of years of surgical experience as a Registered Nurse

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of Surgical experience as a RN:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 – 5 years</td>
<td>31</td>
<td>27.2%</td>
</tr>
<tr>
<td>6 – 10 years</td>
<td>28</td>
<td>24.6%</td>
</tr>
<tr>
<td>11 – 15 years</td>
<td>13</td>
<td>11.5%</td>
</tr>
<tr>
<td>16 – 20 years</td>
<td>20</td>
<td>17.6%</td>
</tr>
<tr>
<td>21 – 30 years</td>
<td>17</td>
<td>14.9%</td>
</tr>
<tr>
<td>31 years and above</td>
<td>4</td>
<td>3.6%</td>
</tr>
<tr>
<td>Total</td>
<td>114*</td>
<td></td>
</tr>
</tbody>
</table>

*Incomplete data n = 14

The bivariate data sets of total scores achieved on the KASRP, and the number of years of surgical experience the participants had are presented below in Figure 3 below. It was again evident that the points did not have any linear trend, therefore there was no correlation between the scores achieved and the number of years of surgical experience the respondents had. A correlation coefficient to measure the strength of the linear relationship between the two variables also showed no significance, r = .164.
5.1.9 Hours worked per week

One hundred and fourteen RN’s responded to this question. The mean hours worked per week was 32.62 hours; median was 32.00. The standard deviation was 11.13 hours.

The bivariate data sets of total scores achieved on the KASRP, and the number of hours each participant worked per week are presented in figure 4 below. It was evident the points did not have any linear trend, therefore there was zero correlation between the scores achieved and the number of hours worked per week by the participants. A correlation coefficient to measure the strength of the linear relationship between the two variables also showed no significance, r = .264.
5.1.10 Highest Qualification

Of the 112 participants who responded to this question, 7.1% had a Master’s Degree (n=8). Seventeen point nine percent had a Postgraduate Diploma (n=20), and 30.4% (n=34) had a Postgraduate Certificate. Forty four point six percent (n=50) had a Bachelor Degree. See table eight below. Sixteen incomplete responses were not included in the data.

Table 8 Highest qualification

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor Degree</td>
<td>50</td>
<td>44.6%</td>
</tr>
<tr>
<td>Post Graduate Certificate</td>
<td>34</td>
<td>30.4%</td>
</tr>
<tr>
<td>Post Graduate Diploma</td>
<td>20</td>
<td>17.9%</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>8</td>
<td>7.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>112</strong></td>
<td></td>
</tr>
</tbody>
</table>

* Incomplete data n = 16
Simple Boxplot graphs were performed to demonstrate total percentages of scores achieved in relation to participants’ highest qualifications. The spread of the five number summary points across the four boxplots ranged from 60% for bachelor degree to between 80% and 90% for all four groups. Post graduate certificate percentages showed a shift upwards, with Masters’ degree having an even higher shift so that the upper whisker was not evident. The interquartile range of the group’s bachelor degree, post graduate certificate and post graduate diploma were in a similar range of just under 80%, with the interquartile range for the Masters’ degree between 80% and 90%. See figure 5 below.

![Boxplot Graph of total percentages by Qualification](image)

Figure 5 Total percentage of KASRP scores achieved by highest qualification
Note – numbers 88 and 51 on Figure 5 denote the participant codes of outlying participants’ responses whose scores fell outside the range of the displayed box.

5.1.11 Demographic Ethnicity
Demographic ethnicity data were identified in five ethnic categories, (NZ European, Māori, Samoan, Cook Island Māori, Tongan, Niuean, and African) and another
category for other ethnicities not represented by the stated five categories. The ethnicities specified as other were stated as Australian/British, British, European, English, Dutch, South African, Indian, Fiji and Filipino. One hundred and fourteen participants responded, of which five participants identified with two ethnicities and one participant identified with three ethnicities.

Ninety of the participants (78.9%) were NZ European, which was higher than the national distribution of 60.7% RN’s who identified as NZ European ethnicity (Nursing Council of New Zealand, 2018). The representation of NZ Māori workforce who participated in the survey was 8.8%. This was slightly more than the 7.1% national distribution of RN’s who identified as NZ Māori.

5.1.12 Country of original nurse training

Twenty eight participants (25%) out of 128 stated their country of original nurse training as other than NZ. This percentage closely correlated with the NZNC profile of the NZ nursing workforce 2016 – 2017 (Nursing Council of New Zealand, 2018) which stated 26% of the overall practising nurse workforce were internationally qualified nurses. Due to the small number in ‘other’ countries, the names of the countries have not been specified individually. Sixteen incomplete responses were not included in the data. See Table 9 below.

Table 9 Country of original nurse training

<table>
<thead>
<tr>
<th>Country of training</th>
<th>Number (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Zealand</td>
<td>84</td>
<td>75%</td>
</tr>
<tr>
<td>Other</td>
<td>28</td>
<td>25%</td>
</tr>
<tr>
<td>Total</td>
<td>112 a</td>
<td></td>
</tr>
</tbody>
</table>

a Incomplete data n = 16

Simple Boxplot graphs were performed to demonstrate total percentages of scores achieved in relation to participants’ country of original nurse training. There was very little difference between the two groups as the interquartile range was very similar. This was also evident when the means were compared (NZ = 30.26, Other = 30.40). Standard deviation was (NZ = 3.165, Other = 3.601). See Figure 6 below.
5.1.13 Self-evaluation of level of knowledge regarding pain management

To enable comparison with international studies and nurses’ self-evaluation of knowledge regarding pain management, the respondents were requested to rate their level of knowledge regarding pain management prior to undertaking the KASRP. They were asked to indicate a level between excellent, good, average, fair or poor.

Of the 113 participants who completed this question, only 10 of the total (8.85%) rated their level of knowledge in pain management as excellent. Seventy-six (67.26%) rated a good level of knowledge. Twenty-seven (23.89%) respondents rated their knowledge as average. Table 10 below presents the numbers within each DHB. Fifteen incomplete responses were not included in the data.
A simple Boxplot graph was performed to demonstrate total percentage of scores in relation to participants’ self-evaluation of level of knowledge of pain management. The spread of the five number summary points across the three boxplots ranged from approximately 55% for the group with good level of knowledge, to between 85% and 90% for all three groups. The interquartile range for the excellent level of knowledge group and the average level of knowledge group were in a similar range, while the group with a good level of knowledge had a lower interquartile range. The lower quartile 25% of the good level of knowledge group had a larger range compared to the Average level of knowledge group. Whereas the excellent level of knowledge group had no lower whisker. See Figure 7 below.
Figure 7 Total percentage of KASRP scores by self-evaluation of level of knowledge

Note – numbers 85 and 88 in Figure 7 denote the participant codes of outlying participants’ responses whose scores fell outside the range of the displayed box.

5.1.14 Comparison of responses to patient clinical vignette questions 38, 39, 40 and 41

The two patient clinical vignette questions generated responses which demonstrated that 50.8% of respondents answered the question regarding the assessment of Andrew’s pain correctly, and 58.6% answered the question regarding the assessment of Robert’s pain correctly. However, only 8.6% respondents chose the correct analgesic dose for talking and joking Andrews pain, and only 18.8% chose the correct analgesic dose for grimacing Robert. See tables below.
Table 11 (Q38) Andrew talking joking pain score

<table>
<thead>
<tr>
<th>Q38 - Andrew talking joking pain score</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect</td>
<td>22</td>
<td>17.2</td>
<td>25.3</td>
<td>25.3</td>
</tr>
<tr>
<td>Correct</td>
<td>65</td>
<td>50.8</td>
<td>74.7</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>87</td>
<td>68.0</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>-99</td>
<td>32.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>128</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 12 (Q39) What action do you take regarding Andrew’s pain

<table>
<thead>
<tr>
<th>Q39 - What action do you take regarding Andrews pain</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect</td>
<td>22</td>
<td>17.2</td>
<td>25.3</td>
<td>25.3</td>
</tr>
<tr>
<td>Incorrect</td>
<td>16</td>
<td>12.5</td>
<td>18.4</td>
<td>43.7</td>
</tr>
<tr>
<td>Incorrect</td>
<td>38</td>
<td>29.7</td>
<td>43.7</td>
<td>87.4</td>
</tr>
<tr>
<td>Correct</td>
<td>11</td>
<td>8.6</td>
<td>12.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>87</td>
<td>68.0</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>-F</td>
<td>32.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>128</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 13 (Q40) Robert grimacing pain score

<table>
<thead>
<tr>
<th>Q40 - Robert grimacing pain score</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect</td>
<td>9</td>
<td>7.0</td>
<td>10.7</td>
<td>10.7</td>
</tr>
<tr>
<td>Correct</td>
<td>75</td>
<td>58.6</td>
<td>89.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>84</td>
<td>65.6</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>-99</td>
<td>34.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>128</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 14 (Q41) What action do you take regarding Robert's pain

<table>
<thead>
<tr>
<th>Q41 - What action do you take regarding Roberts pain</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect</td>
<td>7</td>
<td>5.5</td>
<td>8.5</td>
<td>8.5</td>
</tr>
<tr>
<td>Incorrect</td>
<td>12</td>
<td>9.4</td>
<td>14.6</td>
<td>23.2</td>
</tr>
<tr>
<td>Incorrect</td>
<td>39</td>
<td>30.5</td>
<td>47.6</td>
<td>70.7</td>
</tr>
<tr>
<td>Correct</td>
<td>24</td>
<td>18.8</td>
<td>29.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
<td>64.1</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>-F</td>
<td>35.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>128</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.2 Chapter summary

The KASRP score was calculated for each participant and summarised for the sample, giving a total percentage of correct answers as 73.1%. The questions and responses from the KASRP survey were presented by percentages in three separate tables. Those were items receiving more than 80% correct response rate, items receiving between 50% - 80% correct response rate and items receiving less than 50% correct response rate.

Descriptive statistics for the main demographic variables were discussed, responses from the five DHB’s, gender, age groups, number of years as RN, number of years surgical experience, highest qualifications, country of original nurse training and respondents self-evaluation of knowledge regarding pain management, were presented in table form.

Scatterplot graphs demonstrated total scores against respondents’ age, years as RN, years of surgical experience and the number of hours the person worked per week. Boxplot graphs were used to present total percentages by highest qualification and self-evaluation of level of knowledge.
6 Chapter six: Discussion and Conclusion

6.1 Introduction

This chapter will discuss the study results and implications for practice. There will be discussion of the results of the KASRP survey and how these compare to international research findings.

The mean total score achieved on the KASRP survey in this study was 73.1%, with only 41.7% participants achieving a score of 80% or over. A mean total score of 73.1% was below the suggested minimum acceptable score of 80% by the authors of the KASRP as representing adequate knowledge and attitudes (Ferrell & McCaffery, 2014).

The results of the current study were compared with other studies published by international researchers who also used the KASRP tool to measure nurses’ knowledge and attitudes to pain. Surprisingly none of these studies achieved a recommended mean score of 80%. Brant et al. (2017) 72%, Duke et al. (2013) 63%, Gretarsdottir et al. (2017) 68.8%, Moceri and Drevdahl (2014) 76%, and Vickers et al. (2014) 65.7%. These scores would indicate, according to Ferrell and McCaffery (2014) there were nurses in these studies from various parts of the world did not demonstrate adequate knowledge and attitudes to pain management. Translated into practice, this may suggest patients’ pain management could be affected.

6.1.1 Country of original nurse training

Participants were asked to identify their country of original nurse training. Twenty five percent of the participants indicated they had undergone nurse training overseas. In an attempt to determine any differences, the KARSP scores of the 25% participants trained overseas were compared to the scores of the 75% who stated they had trained in NZ. Ultimately, the boxplot and standard deviation of the scores did not indicate any difference between the two groups. These results support the consistency of results regarding knowledge and attitudes to pain across the international groups of nurses, as evidenced by the findings of other international researchers (Gretarsdottir et al., 2017; Jarrett et al., 2013; Moceri & Drevdahl, 2014; Vickers et al., 2014).
6.1.2 Participants Ethnicity

Participants were asked to indicate their demographic ethnicity from the NZ census ethnicity categories (Ministry of Health, 2013), NZ European, Māori, Samoan, Cook Island Māori, Tongan, Niuean, and African. An open text category of ‘Other’ was added for other ethnicities which were not represented in the stated seven categories. The ethnicities specified by participants as other were stated as Australian/British, British, European, English, Dutch, South African, Indian, Fiji Islander, and Filipino. One hundred and fourteen participants responded, of which five participants identified with two ethnicities and one participant identified with three ethnicities.

Ninety of the participants (78.9%) identified as NZ European, which is higher than the national distribution of 60.7% RN’s who identified as NZ European ethnicity on the NCNZ register (Nursing Council of New Zealand, 2018). The representation of NZ Māori workforce who participated in the survey was 8.8%. This is slightly more than the 7.1% national distribution of RN’s who identified as NZ Māori. Due to the varied and small numbers in some categories of ethnicity, these results were not used to compare against any scores or questions on the KASRP. However, the findings were useful in terms of reflecting the NZ nursing workforce and could be considered for use in relation to practice.

6.1.3 Ages of participants

The mean age was 42.33 years (range 21 – 68 years). A total of 33.6% of participants were aged between 41- 50 years, which was the largest age group for the study. When comparing with other studies, it closely aligns with Latina et al. (2015) who reported 35% respondents aged between 41 – 50 years, and Brant et al. (2017) who reported a mean age of 43 years.

All other studies who researched nurses’ knowledge and attitudes to pain reported their largest groups being in the younger age bracket. Moceri and Drevdahl (2014) had 46.2% participants aged between 20-30 years. Vickers et al. (2014) reported 56.4% aged 20-30 years and Duke et al. (2013) had 81% participants less than 30 years old, however it should be noted that these participants were students. Gretarsdottir et al. (2017) largest age group of 51% was aged 31-50 years. There were 21.2% respondents aged 20-30 years in this study.
The smallest age group in this study was 61-70 years (4.4%) which correlates with Gretarsdottir et al. (2017) whose smallest age group of 3.4% was aged 61-70 years. Latina et al. (2015) also reported their smallest age group at 6.6% of participants over the age of 60 years. However, Moceri and Drevdahl (2014) smallest age group was younger, with 8.8% participants aged 51+ years, Vickers et al. (2014) had 5.3% aged between 41-50 years, Brant et al. (2017) did not state age ranges, Duke et al. (2013) had only 5% over the age of 41 years.

When average scores were compared between the studies with the majority of participants in the older age groups (66.6%) and the studies with a majority of younger participants (68.9%), there was very little difference between them, with the younger group scoring slightly higher. These results could suggest there were no influence on nurses’ knowledge and attitudes to pain from experiential knowledge, traditions, intuition and tacit knowledge for the older age groups (Moule, Aveyard, & Goodman, 2016; Tanner, 2006). Equally, with undergraduate education being reported as falling short in the arena of knowledge and attitudes to pain curriculum content (Drake & De Williams, 2017; Mackintosh-Franklin, 2017) it could be questioned how the younger age group averaged slightly better than the older age group. Relevance of nurses’ age groups will be discussed further in the next section when addressing years as an RN and years of surgical experience.

6.1.4 Years as a Registered Nurse and surgical experience

To determine if there was a correlation between years as an RN and years of surgical experience with KASRP scores, participants were asked to indicate the number of years they had been an RN and also the number of years of surgical experience. The mean number of years participants had been qualified as RN’s was 16.89 (median 15.50). This reflects the NZ nursing population as according to the Nursing Council of New Zealand, of the 98% of nurses who renewed their Annual Practising Certificate, 53% of these nurses had been practising for more than 15 years (Nursing Council of New Zealand, 2018).

The percentage of participants who had been an RN for more than ten years was 60.8%, with 47.6% participants having more than ten years of surgical experience. There was no correlation found between KASRP scores achieved and the number of
years the participants had been an RN or by years of surgical experience. This outcome added to the mixed results achieved by other researchers worldwide in which pain management is an expected aspect of the work in various clinical contexts. Some researchers demonstrated positive correlations when addressing years as an RN, and experience in their specialised field with higher scores on the KASRP.

Brant et al. (2017) argued that having five years or more of experience was predictive of having a higher KASRP score. Similarly, in the field of cancer nursing, Utne et al. (2018) and in paediatric nursing (Smeland, Twycross, Lundeberg, & Rustøen, 2018), correlations were found between years as an RN and experience in their particular field with higher scores on the KASRP. Conversely, Gretarsdottir et al. (2017) reported despite 53.6% of nurses having over ten years’ experience as a nurse, there was no association between work experience and KASRP scores.

It has been suggested the amount of time as an RN may actually have a negative effect on the nurses’ knowledge and attitudes to pain. The RN can experience burnout, lack of empathy, and become unmoved by the patients’ pain after experiencing patients in pain for a long period of time (Abellanoza, Provenzano-Hass, & Gatchel, 2018; Slatyer, Williams, & Michael, 2015). Nurses have been quoted as saying the patients’ pain is normal, and is to be expected after surgery (Mackintosh-Franklin, 2014b). Furthermore, this lack of empathy can affect the nurses’ motivation to address the patients’ pain (Mackintosh-Franklin, 2014b).

Mackintosh-Franklin (2014b) described a mechanistic view of the nature of pain and linked it only to the physical treatment the patient has received. With the nurses’ attitude focussed on a medical model of care, the nurse may be inclined to place more emphasis on the technical aspects of the patients’ pain and base their judgements on the type of operation the patient had undergone (Mackintosh-Franklin, 2014b).

However, the management of pain involves more than treating the injury (Wikström, Eriksson, Årestedt, Fridlund, & Broström, 2014). As realized by Loeser and Melzack (1999) the nurse needs to address the biopsychosocial aspect of the
patients’ pain during their assessment. The patients’ cultural beliefs and social needs also need to be considered (Argoff et al., 2018).

Nevertheless, in this study the length of time as an RN, and years of surgical experience had no correlation to the scores achieved in this author’s study. Of interest was one of the highest scores attained on the survey was from a respondent who had been an RN for only five years. Equally, other highest scores were achieved by an RN with over twenty years registration, and another from an RN with forty years registration. This indicates that despite being an RN for a short or long time, it does not predict knowledge and attitudes to pain management, which could suggest that nurses knowledge and attitudes are influenced by factors other than clinical experience.

The evidence above from Mackintosh-Franklin (2014a) was obtained using a qualitative survey method, and had the advantage of obtaining nurses own thoughts and experiences. It would be beneficial to use this method of research in NZ to ascertain more in depth explanations for nurses’ knowledge and attitudes to pain.

While there was no correlation between lengths of time nurses had been an RN or the surgical experience they had with their knowledge and attitudes to pain, researchers have proposed nurses’ having a genuine interest in pain management could be related to improved scores on KASRP. Kiekkas et al. (2015) argued that continuing education in Greece was scarce; therefore they concluded the reason for nurses scoring higher on the KASRP would be most likely due to the nurses’ personal interest in the topic and wanting to keep up to date with evidence based knowledge.

6.1.5 Self-evaluation of knowledge regarding pain management
Participants were asked to self-evaluate their level of knowledge regarding pain management, as poor, fair, average, good, or excellent. Eight point eight five percent of participants rated their level of knowledge as excellent. This corresponded with the total KARSP scores achieved on the boxplot graph by participants who rated their knowledge as excellent. The middle quartile of scores was 80% and the scores achieved as indicated on the graph were in the upper 75% quartile, with scores
between 80% and 90% for those participants who indicated an excellent level of knowledge.

However, when examining the group that rated their level of knowledge as good (67.26%), it was difficult to interpret if these respondents had estimated their level of knowledge appropriately. The reason for this was that the mean score of over 75% sits in the middle quartile, however, the lower quartiles stretched down to approximately a score of 55%, which indicated quite a low score, and the upper quartile was as high as the group who rated their knowledge as excellent at just under 90%.

Conversely, the group that rated their knowledge as average (23.89%) appear to have underestimated their own level of knowledge. The middle quartile and upper quartile of this group matched that of the group who rated their knowledge as excellent. Also, the lower quartile achieved scores of 70% to 80% and the lower 25% whisker is between 60% and 65%, which was higher than the group who rated their level of knowledge as good.

These results are suggestive of nurses with a good level of knowledge underestimating their ability, while other nurses have an unrealistic perception about their level of knowledge and attitudes to pain. This was also identified by Keen et al. (2017), when comments were noted from experienced nurses, that they did not see the need to attend an education session as they had already been through unit specific education.

This was an indication of nurses assuming their pain knowledge was up to date and not requiring further education. Vickers et al. (2014) reported similar findings of participants having an inaccurate self-evaluation of their knowledge and attitudes to pain. With 7.4% of their participants rating their level of pain management knowledge as excellent, 75.5% as good, and 17% as average. However, the overall mean score for participants was only 65.7%, compared to the recommended score of 80%. Their analysis revealed only 3.2% of their respondents achieved an overall score of 80% or above.
The implications of this wider finding for the nursing profession and more importantly for the patients were the risk of the patients’ suboptimal pain management due to nurses’ inaccurate perception of their knowledge and attitudes to pain. The relationship between post-operative complications and inadequately managed surgical pain is well established (Barbieux et al., 2017; Khan et al., 2014; Ljungqvist et al., 2017; Schug, 2015; Silva et al., 2013; Wall et al., 2014).

6.1.6 Hours worked per week
The hours worked per week by the participants was a median of 32 hours and results indicated zero correlation between the scores achieved on the KASRP and the number of hours the participants worked per week (r = 0.264).

6.1.7 The culture of the department
The culture of the department in which the nurse works has been shown to have an impact on the nurses’ knowledge and attitudes. This was demonstrated by Kiekkas et al. (2015) who argued the environment had an effect on nurses’ knowledge and attitudes, as they detected significant differences in their KASRP scores based on the departments in which the participants of the study were employed.

Denness, Carr, Seneviratne, and Rae (2017) demonstrated how the influence and demands of the culture of the unit put nurses under pressure to over administer opioids to patients in order to attain adequate pain management and expedite patient discharge. This was a fast track orthopaedic department where bed shortages and pressure from staff in other departments of the hospital pressurised nurses to discharge their patients in order to free up beds for incoming patients.

This is not an uncommon problem, as high workloads, time pressure and staffing issues have also been shown to impact the nurses’ ability to make patient centred pain management decisions. (Chambers & Shepler, 2018; Pretorius et al., 2015; Veal et al., 2018) cited time pressure as a barrier to nurses’ to administer IV morphine to the patient for pain relief. These decisions were influenced by the amount of time required by the nurse to monitor the patient following administration of IV morphine, resulting in the nurses’ decision not to treat.
The problem of understaffing was addressed in a report on working conditions and hospital quality of care in twelve countries in Europe (Aiken, Sloane, Bruyneel, Van den Heede, & Sermeus, 2013). The majority of nurses in each country reported there were not enough nurses to provide quality healthcare. This has the potential to have a negative impact on the pain management nurses are able to provide to their patients.

The pressure of the hospital culture was demonstrated by Pasero, Quinlan-Colwell, Rae, Broglio, and Drew (2016). In a USA hospital the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey scores were linked to hospital reimbursement for care undertaken. Consequently the nurses reported feeling tremendous pressure to control the patients’ pain in order for the hospital to achieve favourable HCAHPS scores and ultimately reimbursement for care. This resulted in nurses feeling compelled to administer higher than required opioid doses to their patients.

The above finding is in contrast to the results of the present study and other researchers findings of Vickers et al. (2014), Brant et al. (2017), Gretarsdottir et al. (2017); Kiekkas et al. (2015) on their KASRP surveys. The answers the participants gave to the patient vignette questions indicted participants made decisions to undertreat patients’ pain, rather than over treat. However, the above examples demonstrate not only how the culture of the hospital can affect nurses’ knowledge and attitudes to pain management but also outcomes for the patient. It also demonstrates a limitation of using a closed question tool to measure knowledge and attitudes to pain. As stated earlier, this tool does not encompass the contextual factors that occur in real life situations. This system limits the nurses’ autonomy and decision making regarding their patients pain management and is not used in NZ. However it does demonstrate a risk to the patient and their pain management when care is business led care compared to patient outcome focussed.

Another issue related to using fixed protocols for pain management was addressed by Pasero et al. (2016). It was determined that a protocol of increasing doses of opioids was tied to an increase in patient pain scores. Therefore, if the patient scored pain as 7/10 or higher, the hospital protocol dictated the nurse administer a higher
dose of opioid. The possible ramifications for this could be the nurse is deterred from conducting a thorough pain assessment in case there is a need to increase the dose of opioid. There is also a risk of serious adverse effects if the patient is overtreated with opioids (Ministry of Health, 2018a).

The knowledge of opioids, and in particular morphine, will be discussed next. Morphine is the main opioid used for analgesia in postoperative care and participants’ responses were addressed next regarding their pharmacological knowledge of morphine.

### 6.1.8 Pharmacological knowledge of morphine

Despite morphine being the main opioid used for postoperative pain management, there was a significant difference between nurses’ pharmacological knowledge regarding relevant morphine pharmacokinetics. Only 39.8% of participants answered correctly regarding the peak effect time for morphine given orally, whereas, a much larger percentage, 86.2% of the participants, answered the question regarding peak effect time for morphine given IV. The potential implications of these results could be twofold. The patient is at risk of receiving sub therapeutic analgesia due to the nurses’ lack of pharmacological knowledge, or an accumulation of dose effect with unnecessary further increments of analgesia as the nurse is ignorant of the peak effect time that the morphine will give optimum analgesia.

Time to peak effect is associated with maximum plasma drug concentration (Ministry of Health, 2018a). This knowledge is important for nurses when they are assessing the effectiveness of the analgesia they have given, and also the timing for giving further increments of analgesia. A possible reason for the participants having a higher correct response rate to the IV morphine question compared to the oral morphine question may be that nurses are more alert to the effect of giving a medication intravenously as is has a far faster effect than when administering the same medication orally.

When compared with international research, Gretarsdottir et al. (2017) detected a small difference between their answers regarding oral or IV morphine peak effect. They found 61.7% of participants answered the peak effect of oral morphine
correctly and 71.5% answered correctly regarding IV morphine. Vickers et al. (2014) had only a slightly better result than this author with 43% participants answering correctly regarding peak effect of oral morphine. However, Vickers et al. (2014) did not specify the percentage for answers regarding peak effect of IV morphine.

The participants’ knowledge in the present study was slightly better regarding the statement ‘The usual duration of analgesia of 1 – 2mg morphine IV is 4 – 5 hours’. Despite a total of 79% of participants answering this correctly, it does demonstrate that 21% of those who participated did not have the correct pharmacological knowledge of the IV morphine they will be administering to their patients. These results are similar to Gretarsdottir et al. (2017) result of 78.75% correct answers, however, Brant et al. (2017) only had 31% participants answer this question correctly. Other authors Vickers et al. (2014) and Moceri and Drevdahl (2014) did not indicate results for these questions.

6.1.9 Pain management in cancer care
An even higher percentage, 88.2% of participants in the present study, showed an inadequate knowledge of tolerance to adverse opioid effects. Participants were presented with a scenario on the KASRP regarding a patient with persistent cancer pain receiving continuous intravenous morphine. When questioned about the likelihood of the patient developing significant respiratory depression after an increase in the hourly rate of intravenous morphine, only 11.8% of respondents gave the correct answer.

These results are even poorer than other authors’ findings who also established that their participants achieved low scores. Moceri and Drevdahl (2014) participants achieved 21.8% correct response, Gretarsdottir et al. (2017) 19.1% correct response, Vickers et al. (2014), 17.8% correct response, Brant et al. (2017), 17% correct response rate. The participants in this study achieved the lowest results compared to other international studies cited.

Two more questions related to the route, and the use of multimodal analgesia for the treatment of patients with pain as a consequence of cancer, were among the eight
questions mostly answered incorrectly. This is an indication that nurses have a
deficit in their knowledge around the specialised topic of cancer related pain.
Despite this response, 95.5% answered correctly that morphine is the drug of choice
for patients with prolonged moderate to severe cancer pain.

This was an interesting finding that all of these researchers (Brant et al., 2017;
Gretarsdottir et al., 2017; Latina et al., 2015; Vickers et al., 2014; Yava et al., 2013)
found poor results from participants when asked about a patient with cancer pain.
However, the participants in this study worked in surgical areas and not specifically
with cancer patients. Nonetheless, patients with cancer may also require surgical
intervention so there would be a reasonable level of knowledge expected from these
participants. It is therefore, undetermined if these results are due to a lack of
knowledge of opioids or if they are due to the participants attitudes. One
consideration could be the participants’ choices are attributed to lack of knowledge
and fear of the use of opioids.

Whereas, participants demonstrated a strong level of knowledge regarding the
benefits of multimodal analgesia, with 95.9% acknowledging it resulted in better
pain control and fewer side effects. Also, despite the survey being directed at nurses
working in adult postoperative care, almost all (97.9%) of participants could
correctly answer the question related to children less than 11 years old can reliably
report their own pain.

6.1.10 Assessment of pain/patient case vignettes on the KASRP

A high percentage of participants believed their own assessment over the patients’
self-reports of pain, and even more participants leaned towards under-treatment of
the patients’ pain when the patient did not display outward physical signs of pain
behaviour. This substantiates McCaffery et al. (2007) argument that nurses are
misinformed about the possible behaviours of patients with pain. The findings are
discussed below when examining the results from the two patient case vignette
questions which were employed to explore clinical conclusions in scenarios
constructed to provoke potential knowledge and attitude conflict. The findings,
however, emphasised the complexity of pain assessment and nurses’ knowledge and
attitudes to pain.
6.1.11 Comparison of the two patient case vignettes on the KASRP

Questions thirty eight to forty one on the KASRP referred to a patient case vignette which presented two patients on their first day following abdominal surgery (See table 2). Participants were requested to make clinical decisions regarding assessing the patients pain score and if they would administer a dose of IV morphine, and if so, how much.

The assessment presented to participants was made two hours after the patient had received 2mg of intravenous (IV) morphine. Half hourly pain ratings following the IV injection ranged from 6 to 8/10. Both patients had no clinically significant respiratory depression, sedation, or other untoward side effects and had identified 2/10 as an acceptable level of pain relief. The physicians order for analgesia was “morphine IV 1 – 3mg one hourly (q1h) pain relief.”

On assessment the only difference between the patients was outward physical signs of pain behaviour. Andrew was smiling, talking and joking with his visitor, whereas Robert was lying quietly and grimaces as he turned in bed. Both patients rated their pain score as 8/10 on the Verbal Rating Scale. When participants were asked to assess smiling and joking Andrew’s pain, 74.7 % of respondents agreed with the patient and rated his pain score as 8/10, while 25.3% of respondents did not agree with the patient’s own assessment and rated the pain score lower. However, 89.3% agreed with the pain score of 8/10 of the quiet and grimacing Robert, while 10.7% did not agree. This implied that not only did all the respondents not agree with the patients’ own pain score, but also, when the patients’ behaviour did not fit with the respondents’ expectations of a patient in pain, even more respondents disagreed with the patients’ pain score. This was in clear conflict with McCaffery (1968) definition ‘pain is whatever the experiencing patient says it is, existing whenever the experiencing person says it does’. This also contradicts the finding that 97.7% respondents on the survey agreed that ‘the most accurate judge of the intensity of the patient’s pain is the patient’.

The responses from the participants on the KASRP regarding assessment of Andrew and Robert’s pain mirror those of (McCaffery et al., 2007) of nurses being
misinformed about possible behaviours of patients with pain. However, it could be disputed if the responses are due to nurses being misinformed or if their decisions are based on their attitudes to the patient. Notwithstanding the reasons for the choices the nurses make, these results demonstrate little progress towards improving nurses’ knowledge and attitudes to pain since the work of McCaffery et al. (2007), Vickers et al. (2014) Moceri and Drevdahl (2014) and Gretarsdottir et al. (2017) with regard to nurse’s knowledge and attitudes to pain management.

Later studies have also demonstrated nurses pain management decisions have been made according to patients’ behaviour (Bach et al., 2018; Utne et al., 2018). Participants in the study by Utne et al. (2018) questioned the accuracy of the patients’ verbal rating score, and rated pain scores lower than what the patient reported, based on the patients’ body language. While nurses in Bach et al. (2018) silently interpreted the patients’ pain level without talking to the patient, and based their pain assessment on the patients’ demeanour and body language, which disadvantaged the patient and their ability to contribute to the assessment.

6.1.12 Clinical decisions regarding analgesia: patient case vignettes on the KASRP

When asked about treating patients’ pain on the KASRP survey participants were presented with the following statement ‘The most likely reason a patient with pain would request increased doses of pain medication is the patient is experiencing increased pain’. One hundred percent of participants in this study agreed with this statement on the KASRP.

However, when answering the patient case vignette questions with regard to the amount of morphine the participant would administer, only 12.6% stated their action would be to administer the recommended dose of 3mg morphine to smiling and joking Andrew whose pain score was 8/10. Also, 25.3% participants stated they would not administer any morphine at all. A slightly higher rate of 29.3% participants stated they would give quiet and grimacing Robert the recommended dose of 3mg morphine, and 8.5% stated they would not administer any morphine.
Even when the participants agreed with the patient’s pain score of 8/10, this survey shows that 70.7% of nurses still chose to undertreat Robert’s pain even when he was quiet and grimacing, and 87.4% undertreated Andrew who was talking and joking.

The responses of not administering any further increments of IV morphine despite the patient rating their pain as 8/10, also contradicts 95.8% of participants of the survey who agreed with the statement, ‘After an initial dose of opioid analgesic being given, subsequent doses should be given in accordance with the patients response’. Unfortunately these responses are also congruent with other international researchers. Vickers et al. (2014), reported only 12.8% of their participants would give the recommended dose of 3mg morphine to smiling, joking Andrew, and 40.4% would give quiet, grimacing Robert the recommended dose of 3mg morphine.

However, Gretarsdottir et al. (2017) reported higher scores with 48.9% participants giving smiling, joking Andrew the correct dose of 3mg of morphine, and 67.7% would give the correct dose to quiet and grimacing Robert. Brant et al. (2017) reported 39% of respondents selected the correct dose of morphine to give to smiling, joking Andrew and 58% selected the correct dose for quiet, grimacing Robert. Moceri and Drevdahl (2014) concluded that only 44% of their participants provided the correct answer on patient vignettes; however they did not state specific percentages of results for each question.

Despite participants agreeing the patient was the most accurate judge of their pain, the results on the patient clinical vignette show the translation of this knowledge within a scenario may be more complex. There appears to be a clear discrepancy between what the nurses’ say and do, in regard to assessment and treatment of patients’ pain. Belief that the patient is the most accurate judge of the presence of pain was not demonstrated in the responses to the patient vignettes.

Nonetheless, it should be noted that the clinical vignette questions did not encompass the complexities and contextual factors of real life practice. Therefore the rationale for discrepancies in nurses’ decisions can be debated, whether it is due to nurses knowledge or attitudes to pain or other outside influences.
Qualitative studies interviewing clinicians and patients do demonstrate that these findings are replicated in practice, with nurses’ decisions having been dictated by institutional barriers and hospital protocols (Denness et al., 2017; Veal et al., 2018). The clinical vignette question asks the amount of IV morphine the nurse would administer to Robert or Andrew (1 – 3mg). Hospital protocols may dictate an upper limit of 2mg per increment of IV morphine; therefore this may influence the participants’ decisions when answering the question as autonomy in practice may dictate the amount of morphine the nurse may administer to the patient per increment. However, institutional barriers and hospital protocols would not account for the nurses’ underestimating the patients’ pain score. This may be considered to be due to the nurses’ attitudes, with attitudes towards opioids being a consideration for the nurses’ decision to undertreat the patients’ pain. This will be discussed next.

6.1.13 Fear of use of opioids

The explosion of the use of opioids in both medicine and recreationally, has been shown to have provoked concerns in both nurses and patients (Utne et al., 2018). Opioid use is at the highest it has ever been both internationally (Skolnick, 2018) and nationally (Health Quality & Safety Commission of New Zealand, 2018). The USA saw a massive increase in the availability of illicit opioids with approximately 4% of the adult population misusing prescription opioids in 2015 (Skolnick, 2018). The number of people dispensed morphine in NZ significantly increased from 7.5 per 1000 people in 2011, to 11 per 1000 people in 2016. Of every ten people who were prescribed morphine, 1.2 took it for six or more weeks (Health Quality & Safety Commission of New Zealand, 2018).

The performance of participants across key areas of knowledge in this author’s study was significant, and congruent with patient experience evidence. These key areas associated with poor RN performance were lack of knowledge of opioids, knowledge of opioid addiction and abuse. Five of the questions answered incorrectly by more than 50% of the respondents concerned addiction, dependence, and opioid pharmacology. These results were only slightly better than other researchers’ findings and the association with biased attitudes was evident. It appears that improving theoretical knowledge alone was insufficient for changing practice, as the
nurses choices could be affected by their own attitudes, which is becoming apparent, appears difficult to change.

International research concluded similar deficits in their studies. Moceri and Drevdahl (2014) found seven of the questions answered incorrectly by more than 50% of their respondents concerning addiction and dependence, and pharmacological factors influencing dosage of opioids. While both Gretarsdottir et al. (2017) and Vickers et al. (2014) found six questions answered incorrectly on the same topics by more than 50% of their respondents, while Brant et al. (2017) had five questions under 50% answered incorrectly on the same topics.

Nurses’ disproportionate concerns regarding opioid use could be attributed to lack of knowledge, which was demonstrated in the low scores on the answers relating to pharmacological properties of morphine, and scores regarding opioid addiction and abuse (See Table 2). Kiekkas et al. (2015) demonstrated in their study that incomplete post-operative pain knowledge mainly included the action of analgesics and true addiction risks, which contributed to the reluctance of nurses for prescribing opioids and to their administration only when patients actively ask for them.

Also, concerns may have been fuelled by nurses’ inaccurate beliefs that opioids for pain relief would contribute to the patients’ addiction (Krokmyrdal & Andenæs, 2015). Nurses’ attitudes may have influenced their decisions as nurses have been shown to have the opinion that patients with opioid addiction exaggerate, misrepresent and are dishonest when describing the effects of pain medication (Krokmyrdal & Andenæs, 2015). In their study (Krokmyrdal & Andenæs, 2015), nurses indicated a degree of mistrust and negative attitudes towards patients with opioid addiction. Nurses also admitted to lack of knowledge and having inadequate competence to care for patients with addiction.

Consequently, concerns existed that may have increased in view of the current opioid epidemic and fears related to opioids (Brant et al., 2017). Therefore nurses’ knowledge and attitudes need to be updated in an attempt to alleviate biases and attitudes to opioid use. This author and other researchers (Moceri & Drevdahl, 2014; Vickers et al., 2014) have identified gaps in the knowledge and attitudes of nurses in
the area of pain management related to overestimating the risk of addiction to opioids (Brant et al., 2017; Gretarsdottir et al., 2017; Moceri & Drevdahl, 2014; Vickers et al., 2014).

6.1.14 Education

Education has been a major focus of researchers in their attempts to improve nurses’ knowledge and attitudes to pain since the findings of Marks and Sachar (1973). However, knowledge requirements have changed since Marks and Sachar (1973) and indeed since the KASRP tool was first introduced.

There have been conflicting results regarding the education of nurses in knowledge and attitudes to pain. Structured continuing education, even to postgraduate level may be required to ensure nurses have the correct and up to date evidence based knowledge and attitudes regarding pain. Participants in the present study were requested to indicate the highest level of qualification achieved, of which 7.1% had obtained a Master’s Degree. This Master’s degree group also scored higher overall as a group with the middle quartile scores on the boxplot graph being between 80% and 90%.

However, the Bachelor degree and Postgraduate diploma group both had equal scores on the middle quartile of the boxplot graph, which indicates the same level of knowledge and attitudes despite the Bachelor degree group having no postgraduate education and the Postgraduate diploma group having postgraduate education.

The uneven numbers of participants’ qualifications and scores achieved, predisposed the results of the present study to random error and lack of statistical significance. However, the results tentatively demonstrate no correlation between knowledge and attitudes to pain and postgraduate education. This may be influenced by their postgraduate study not being related to pain management. Whereas Yava et al. (2013) determined taking a postgraduate course in pain management was a predictor of higher scores on the KASRP.

Gustafsson and Borglin (2013) and Utne et al. (2018) argued attendance at a pain management course was also indicative of higher KASRP scores. While (Brant et
al., 2017) concluded receiving pain education in the previous year were predictors of higher score’s on KASRP. However, Gretarsdottir et al. (2017) conflicted with these findings, and reported completing a short course on pain management was not associated with better knowledge and attitudes to pain. Nurses have been shown to do well on knowledge tests after attending an education session, but evidence appears lacking in the longer term effects of the education (Jarrett et al., 2013; Keen et al., 2017; Schreiber et al., 2014).

It seems there is no guarantee of uniformity in contents of pain management courses, nor in the learning design of these sessions. Therefore there is no assurance RN’s receive the same standard of education. Likewise, attendance at courses may be purely voluntary and only driven by the nurses’ interest or need to improve pain management knowledge and attitudes. In Pretorius et al. (2015) study of ED nurses in NZ, most of their participants needed and wanted ongoing education regarding pain management. However, if the nurse did not recognise the need to improve, or had the misconception that their knowledge and attitudes to pain management were acceptable, they were at risk of not being motivated to improve or seek any further education regarding pain management (Lewis et al., 2015).

The first building blocks and professional exposure to pain was during undergraduate nursing education, yet student nurse knowledge of pain has been shown to be inadequate. Voshall, Dunn, and Shelestak (2013) identified fewer than half of the participants in their study of faculty staff, acknowledged they used specific pain management guidelines in their education. Also areas of weakness with the faculty staff were in knowledge of medications, interventions and addiction. Voshall et al. (2013) concluded that the importance of using pain management guidelines must be emphasized to provide consistency for nurses entering into clinical practice in all settings. These findings raised concerns regarding the quality of pain management students provided to patients in their care post graduation (Duke et al., 2013; Ung et al., 2015).

Following Voshall et al. (2013) review of 96 nursing faculty from 16 schools of nursing in the USA, they concluded that nursing curricula needed to be strengthened in the topic of pain management. Voshall et al. (2013) stated nurses may be required
to undertake continuing education in pain management to increase knowledge and keep current in pain management protocols.

Nursing curricula needed to be strengthened on the topic of pain management (Voshall et al., 2013) and this may be the place to start increasing nurses awareness of the biopsychosocial aspects of the patient’s pain experience. A start to changing attitudes would be ensuring the nurse appreciates the multi-dimensional nature of the patients’ pain experience, including sensory, affective, cognitive and functional components (Petti, Scher, Meador, Van Cleave, & Reid, 2018). Despite this area being addressed in chronic pain management, it needs to be introduced into acute pain management so that nurses do not focus only on the tissue injury itself. It appears that the culture of the workplace, whether it is the environment, or institutional policies, is a crucial factor in establishing nurse’s knowledge and attitudes to pain (Bernhofer et al., 2016; Feltrin et al., 2018).

6.1.15 Pain assessment
The treatment of the patients’ pain begins with assessment of the pain. Numerical rating scores are easy to use in the postoperative period, and they also constitute valid and reliable measures (Topham & Drew, 2017). However, they are limited in representing the patients overall pain experience (Eriksson, Wikström, Årestedt, Fridlund, & Broström, 2014). As demonstrated by the responses in the clinical vignettes of the KASRP survey, there was no opportunity for dialogue with the patient about their pain experience. The numerical rating scale only captures one element of the patients overall pain experience, the severity level, and this can lead to poor outcomes for the patient (Eriksson et al., 2014) as the management of pain involves more than simply addressing the tissue injury (Wikström et al., 2014). The patients’ biopsychosocial experience of pain needs to be considered for the nurse to appreciate the true meaning of the patients’ pain. This is a limitation of the numerical rating scale tool that is being used (Van Boekel et al., 2017).

Van Boekel et al (2017) used the term ‘acceptable’ as a measurement of movement-evoked pain in their cross-sectional study of postoperative patients between January 2008 and August 2013. They established one in ten patients had unacceptable pain even when they reported a low pain score. In terms of using the numerical rating
scale, a low reported pain score would be an indication to the nurse the patient did not require opioids.

Conversely, Van Boekel et al (2017) reported one in five patients with a high pain score accepted the postoperative pain and were still able to move appropriately. This brings into question if an opioid was required by the patient, as a high pain score would prompt the nurse to administer opioid to the patient. This demonstrates pain management should be guided by the many dimensions of the patient’s pain experience not solely by unidimensional pain scores. Adequate pain assessment is a therapeutic interpersonal transaction between the patient and the nurse where the nurse can observe the patient’s capacity to mobilize, breathe deeply and cough (Van Boekel et al., 2017).

6.1.16 The progress of understanding nurses attitudes to pain management

Despite the disparity between actual and perceived knowledge regarding pain being identified, the understanding of nurses’ attitudes to pain management has been lacking. As stated earlier in this discussion, the nurses’ attitudes were influential in the way nurses’ knowledge and resources were used to make decisions regarding patients’ pain management. As well as professional attitudes being grown from personal attitudes (Carr et al., 2014), nurses have been known to develop profiles of types of patients and ascribe assumptions and biases accordingly (Hwang et al., 2014).

6.2 Conclusion

Nurses have been shown to be unaware of their attitudes to pain management, and therefore not able to instigate any changes. It seems imperative therefore, that nurses’ attitudes are addressed (Hirsh et al., 2010). Despite heightened awareness of, and clinical advances in pain management, evidence continues to suggest that pain has been undertreated in the postoperative setting raising concerns related to nurses’ knowledge and attitudes to pain provision of quality care to the patient.

The major areas of weakness in nurses’ knowledge and attitudes to pain management were displayed in the pharmacological knowledge of morphine, addiction and dependence. Also, there were obvious discrepancies in nurses’
assessments and treatment choices for patients’ pain on the clinical patient vignette of the KASRP survey. These findings closely aligned with findings of other researchers (Gretarsdottir et al., 2017; Lewthwaite et al., 2011; Moceri & Drevdahl, 2014; Vickers et al., 2014) who have established that nurses vary their numerical estimations of patients’ pain based on the demeanour of the patient, and are more likely to believe a patient who is conveying behavioural manifestations of pain.

This study has shown, of the nurses in New Zealand who participated, a correct response rate of 50% or less was attained on items relating to alcohol/drug abuse and dependence, pharmacology and the selection of opioids for pain relief. This indicated no improvement since the findings of McCaffrey and Ferrell (1997) and the findings also correlated with other researchers’ findings around the world, Vickers et al. (2014), Moceri and Drevdahl (2014), Brant et al. (2017) and Gretarsdottir et al. (2017).

This study supported the findings of McCaffery et al. (2007), and later Vickers et al. (2014), Moceri and Drevdahl (2014), and Gretarsdottir et al. (2017) that nurses continue to underestimate the patients’ report of pain, and choose their own judgement over the patients’. Also, it has been suggested that some nurses are misinformed about possible behaviours of patients with pain, and some nurses have shown to be more likely to respond to patients who show overt, non-verbal expressions of pain, compared with the more stoic smiling patient.

Nurses’ personal values can contribute to their decision making regarding pain assessment and management, rather than their level of pain management knowledge (Bernhofer et al., 2016). Abdalrahim, Majali, Stomberg, and Bergbom (2011) showed nurses own experience of pain made them more empathetic towards patients, and Kiekkas et al. (2015) argued more previous personal experience of postoperative pain was predictive ($p = .003$) of nurses achieving higher scores on KASRP. Thus, it seems that there is a potential barrier to effective pain management as nurses need to have an understanding of their own attitudes that drive their decision making practices to enable them to make effective decisions regarding pain assessment and treatment.
Some of the participants had incorrect self-evaluation of their level of knowledge and attitudes to pain. This was an area of concern as if the nurse felt their level of knowledge and attitudes to pain were satisfactory, they may not have been motivated to make any improvements.

There was no correlation demonstrated between scores on the KASRP and participants’ age, years as a RN, years of surgical experience, hours worked per week, and country of original nurse training. RN’s self-evaluation of knowledge and attitudes to pain management demonstrated some nurses underestimated their abilities, while others overestimated.

A strength of the results were that the mean score achieved for the sample was 73.1%. Despite this not achieving the recommended score of 80% as suggested by the authors of the KASRP survey tool (Ferrell & McCaffery, 2014), it was higher than the majority of other published international studies.

To this author’s knowledge, the present study was the first to evaluate knowledge and attitudes of surgical nurses towards pain in New Zealand. The fear of promotion of addiction and poor understanding of analgesia was highlighted in the sentinel work of Marks and Sachar (1973), and since then researchers have continued to identify deficits in nurses knowledge of addiction and deficits in nurse knowledge and attitudes to pain McCaffrey and Ferrell (1997). There have been trends toward improvement in nurses’ pain assessment, but no change in nurses attitudes towards opioids and pain management (McCaffery et al., 2007).

A suggestion for further research in this area would be to address current protocols particularly regarding the use of opioids. Also, rather than focussing on purely educational initiatives, it may be productive to also focus on promoting empathetic understanding of the patients’ pain by using role play and discussion to better illustrate pain assessment and patient behaviours (Mackintosh-Franklin, 2014b). However, nurses do need to keep up to date with evidence based practice. Therefore, a suggestion would be to provide structured regular education about pain management and assessment to maintain positive attitudes to pain management (McNamara et al., 2012).
6.3 Recommendations

- Future surveys using the KASRP to be undertaken across all of NZ, as this study has only been completed in one region.
- A future qualitative survey of RN’s in NZ would be beneficial to obtain some in-depth thoughts and experiences with regard to perceived barriers to RN’s knowledge and attitudes to pain.
- Further education in the area of opioids, drug abuse and addiction would be beneficial to both RN’s and their patients’ in NZ. This would be a step towards allaying RN’s fears and misguided attitudes to opioids.
- Pre-registration programmes need to be surveyed with a view to improvement in the area of pain management. Using pain curriculum guidelines introduced by the IASP, (2018a).
- The importance of the biopsychosocial model of pain needs to be identified. This would include area of acute pain management as well as chronic pain management in pre-registration and post-registration education.
- Structured regular pain education to be implemented for RN’s across the DHB’s in NZ. This would include role play and discussion to better illustrate pain assessment and patient behaviours.
- Assessment of acute postoperative pain requires a biopsychosocial approach. Therefore further investigation of the use of a multi-dimensional versus a unidimensional pain assessment tool in clinical practice requires review.

6.4 Limitations

When comparing the results of the current study with other studies, caution should be used as factors such as response rate, sample size, and setting can cause a variation of results and impact the total scores achieved. A limitation of this study was the low response rate of 27.95%. A distribution of 1500 surveys was required to allow for an approximate response rate of 20%, and consequently 300 responses were required to gain statistical accuracy. However, only four hundred and fifty-eight KASRP surveys were distributed, and only one hundred and twenty-eight were returned. Of these, there were 84 (65.6%) completed surveys and 44 (34.4%) incomplete.
The amount of surveys distributed was out of this researcher’s control, as in order to achieve anonymity from prospective participants, the surveys were emailed from the researcher to the managers to further email to participants. When examining the response rate by each DHB there was some variability demonstrated. A response of 5.2% from one of the DHB’s and 2.6% from another was significantly lower than other DHB’s within the study. On further investigation it became apparent that some emails were not successfully deployed to prospective participants at one of the DHB’s. This may have contributed to the poor response rate. Consequently, the method of requesting a third party at the DHB’s to email the survey link to potential participants did not work adequately.

Despite having easy transferability and being used regularly internationally since its inception, the KASRP tool does have limitations. The quantitative focus of the tool means the researcher is unable to capture any subjective views from participants; therefore participants are unable to provide any reasons for their decision making. Furthermore, any demographic information, which could be used to identify associations between participants answers, have to be collected separately by the individual researcher who uses the tool.

Additionally, international studies that have utilised the KASRP tool have shown consistent results below 80%, which was recommended by the authors of the tool (Ferrell & McCaffery, 2014). As far as this author was aware, there have not been any studies which have reported an overall score over 80%, which would indicate that either there was a serious deficit in nurses’ knowledge and attitudes to pain internationally, or there was a deficit in the tool, given that nurses’ knowledge and attitudes have so many variables.

Another limitation of the KASRP survey was the clinical patient vignettes. Participants were requested to assess and record the patients’ pain score, then make a clinical judgement as to the amount of IV morphine to administer to the patient. However, the KASRP survey did not allow for any additional information to be added to the response from the participant regarding the reason for their clinical decisions. Also, participants were asked to rate the patients pain score using the numerical rating scale. However, the patients’ pain experience is one of a
biopsychosocial nature, and rating a number on a survey does not replicate this pain experience or the dialogue a nurse should have with the patient.

The number of questions answered on the KASRP decreased throughout the survey from 30 (23.4%) missing answers to 46 (35.8%) missing answers by the final question. A possible reason for this could be time limitation for the participants, although, participants were informed of the length of time the survey would likely take to complete. There was not the facility to return to the survey once the participant had exited it. A reason for this was to ensure participants were not able to check answers and then return to complete the survey, as this would have thwarted the results.

Caution should be used when comparing this researcher’s figures regarding the distribution of surgical nurses who identified as Māori against the Nursing Council of New Zealand figures. The Nursing Council of New Zealand (2018) reported figures of nurses that identify as Māori have combined the areas of Intensive Care and Cardiac Care together. However, this study did not include nurses working in Cardiac Care, as this does not come under the surgical domain, but did include nurses working in Intensive care. The combining of nurse’s numbers working in Cardiac and Intensive care by the Nursing Council of New Zealand (2018) may have an impact on the final national percentage of 7.1% distribution of surgical nurses who identified as Māori when comparing against this researcher’s figures.

A limitation of the demographic education statistics was that Hospital certificate and Diploma were not added to the list of choices for highest level of education despite this being approved by the ethics committee for inclusion. This was an administrative oversight.

6.5 Summary
To the best of this researcher’s knowledge, this study was the first in New Zealand to measure knowledge and attitudes of RN’s in the postoperative area regarding pain. The benefits of this research have been to gain baseline information and provide a benchmark with which future strategies can be developed to maintain and
improve RN’s knowledge and attitudes to pain in New Zealand, which can include education both pre and post registration for RN’s.
7 References


Eriksson, K., Wikström, L., Fridlund, B., Årestedt, K., & Broström, A. (2016). Patients’ experiences and actions when describing pain after surgery – A


Manias, E. (2015). Clinically significant pain is experienced by just over a third of all hospitalised patients, affecting around a half of surgical and a quarter of medical admissions. *Evidence-Based Nursing, 18*(4), 121. doi:10.1136/eb-2014-101937


134


http://www.internationaljournalofcaringsciences.org/docs/23.%20Yava.pdf


8 Appendices

8.1 Appendix 1

Knowledge and Attitudes Survey Regarding Pain

True/False – Circle the correct answer

T  F  1. Vital signs are always reliable indicators of the intensity of a patient’s pain

T  F  2. Because their nervous system is underdeveloped, children under two years of age have decreased pain sensitivity and limited memory of painful experience.

T  F  3. Patients who can be distracted from pain usually do not have severe pain.

T  F  4. Patients may sleep in spite of severe pain.

T  F  5. Aspirin and other nonsteroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases.

T  F  6. Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months.

T  F  7. Combining analgesics that work by different mechanisms (e.g. combining an NSAID with an opioid) may result in better pain control with fewer side effects than using a single analgesic agent.
T  F  8.  The usual duration of analgesia of 1-2mg morphine IV is 4-5 hours.

T  F  9.  Opioids should not be used in patients with a history of substance abuse.

T  F  10.  Elderly patients cannot tolerate opioids for pain relief.

T  F  11.  Patients should be encouraged to endure as much pain as possible before using an opioid.

T  F  12.  Children less than 11 years old cannot reliably report pain so clinicians should rely solely on the parent’s assessment of the child’s pain intensity.

T  F  13.  Patients’ spiritual beliefs may lead them to think pain and suffering are necessary.

T  F  14.  After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient’s response.

T  F  15.  Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real.

T  F  16.  Oxycodone 5mg PO is approximately equal to 5-10mg of morphine PO.
17. If the source of the patient’s pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain.

18. Anticonvulsant drugs such as gabapentin (Neurontin) produce optimal pain relief after a single dose.

19. Benzodiazepines are not effective pain relievers and are rarely recommended as part of an analgesic regime.

20. Narcotic/opioid addiction is defined as a chronic neurobiological disease, characterized by behaviours that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.

21. The term ‘equianalgesia’ means approximately equal analgesia and is used when referring to the doses of various analgesics that provide approximately the same amount of pain relief.

22. Sedation assessment is recommended during opioid pain management because excessive sedation precedes opioid-induced respiratory depression.

Multiple Choice – Place a check by the correct answer.

23. The recommended route of administration of opioid analgesics for patients with persistent cancer-related pain is

_____ a) intravenous
24. The recommended route of administration of opioid analgesics for patients with brief, severe pain of sudden onset such as trauma or postoperative pain is

_____ a) intravenous
_____ b) intramuscular
_____ c) subcutaneous
_____ d) oral
_____ e) rectal

25. Which of the following analgesic medications is considered the drug of choice for the treatment of prolonged moderate to severe pain for cancer patients?

_____ a) codeine
_____ b) morphine
_____ c) pethidine
_____ d) tramadol

26. A 30mg dose of oral morphine is approximately equivalent to:

_____ a) Morphine 5mg IV
_____ b) Morphine 10mg IV
_____ c) Morphine 30mg IV
_____ d) Morphine 60mg IV

27. Analgesics for post-operative pain should initially be given

_____ a) around the clock on a fixed schedule
b) only when the patient asks for the medication

c) only when the nurses determines that the patient has moderate or greater discomfort

28. A patient with persistent cancer pain has been receiving daily opioid analgesics for 2 months. Yesterday the patient was receiving morphine 200mg/hour intravenously. Today he has been receiving 250mg/hour intravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of new comorbidity is

a) less than 1%

b) 1-10%

c) 11-20%

d) 21-40%

e) > 41%

29. The most likely reason a patient with pain would request increased doses of pain medication is

a) The patient is experiencing increased pain

b) The patient is experiencing increased anxiety or depression

c) The patient is requesting more staff attention

d) The patient’s requests are related to addiction

30. Which of the following is useful for treatment of cancer pain?

a) Ibuprofen

b) Morphine

c) Gabapentin

d) All of the above

31. The most accurate judge of the intensity of the patient’s pain is

a) the treating physician

b) the patient’s primary nurse
32. Which of the following describes the best approach for cultural considerations in caring for patients in pain:

- a) There are no longer cultural influences in New Zealand due to the diversity of the population
- b) Cultural influences can be determined by an individual’s ethnicity (e.g., Maori are stoic, Italians are expressive)
- c) Patients should be individually assessed to determine cultural influences
- d) Cultural influences can be determined by an individual’s socioeconomic status (e.g., blue collar workers report more pain than white collar workers)

33. How likely is it that patients who develop pain already have an alcohol and/or drug abuse problem?

- <1%
- 5-15%
- 25-50%
- 75-100%

34. The time to peak effect for morphine given IV is

- a) 15 min
- b) 45 min
- c) 1 hour
- d) 2 hours

35. The time to peak effect for morphine given orally is

- a) 5 min
- b) 30 min
- c) 1 – 2 hours
- d) 3 hours
36. Following abrupt discontinuation of an opioid, physical dependence is manifested by the following:

_____ a) sweating, yawning, diarrhoea and agitation with patients when the opioid is abruptly discontinued

_____ b) Impaired control over drug use, compulsive use, and craving

_____ c) The need for higher doses to achieve the same effect

_____ d) a and b

37. Which statement is true regarding opioid induced respiratory depression:

_____ a) More common several nights after surgery due to accumulation of opioid

_____ b) Obstructive sleep apnoea is an important risk factor

_____ c) Occurs more frequently in those already on higher doses of opioids before surgery

_____ d) Can be easily assessed using intermittent pulse oximetry

Case Studies

Two patient case studies are presented. For each patient you are asked to make decisions about pain and medication.

Directions: Please select one answer for each question.

38. **Patient A**: Andrew is 25 years old and this is his first day following abdominal surgery. As you enter his room, he smiles at you and continues talking and joking to his visitor. Your assessment reveals the following information: BP 120/80; HR 80; Resps 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8.

a) On the patients record you must mark his pain on the scale below. Check the number that represents your assessment of Andrew’s pain.

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>No pain/discomfort</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pain/discomfort</td>
</tr>
<tr>
<td>Worst</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b) Your assessment, above, is made two hours after he received morphine 2mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physicians order for analgesia is “morphine IV 1-3mg q1h pain relief.” Check the action you will take at this time.
1. Administer no morphine at this time

2. Administer morphine 1mg IV now

3. Administer morphine 2mg IV now

4. Administer morphine 3mg IV now

Patient B: Robert is 25 years old and this is his first day following abdominal surgery. As you enter his room, he is lying quietly in bed and grimaces as he turns in bed. Your assessment reveals the following information: BP 120/80; HR 80; Resps 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8.

a) On the patients record you must mark his pain on the scale below. Check the number that represents your assessment of Robert’s pain:

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>No pain/discomfort</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain/discomfort</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worst</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b) Your assessment above, is made two hours after he received morphine 2mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physicians order for analgesia is “morphine IV 1-3mg q1hr PRN pain relief!” Check the action you will take at this time:

1. Administer no morphine at this time

2. Administer morphine 1mg IV now

3. Administer morphine 2mg IV now

4. Administer morphine 3mg IV now
8.2 Appendix 2

October 2012

The "Knowledge and Attitudes Survey Regarding Pain" tool can be used to assess nurses and other professionals in your setting and as a pre and post test evaluation measure for educational programs. The tool was developed in 1987 and has been used extensively from 1987 -present. The tool has been revised over the years to reflect changes in pain management practice.

Regarding issues of reliability and validity: This tool has been developed over several years. Content validity has been established by review of pain experts. The content of the tool is derived from current standards of pain management such as the American Pain Society, the World Health Organization, and the National Comprehensive Cancer Network Pain Guidelines. Construct validity has been established by comparing scores of nurses at various levels of expertise such as students, new graduates, oncology nurses, graduate students, and senior pain experts. The tool was identified as discriminating between levels of expertise. Test-retest reliability was established (r> .80) by repeat testing in a continuing education class of staff nurses (N=60). Internal consistency reliability was established (alpha r>.70) with items reflecting both knowledge and attitude domains.

Regarding analysis of data: We have found that it is most helpful to avoid distinguishing items as measuring either knowledge or attitudes. Many items such as one measuring the incidence of addiction really measures both knowledge of addiction and attitude about addiction. Therefore, we have found the most benefit to be gained from analyzing the data in terms of the percentage of complete scores as well as in analyzing individual items. For example, we have found it very helpful to isolate those items with the least number of correct responses and those items with the best scores to guide your educational needs.

Enclosed for your use is a copy of our instrument and an answer key. You may use and duplicate the tool for any purpose you desire in whole or in part. References to some of our studies which have included this tool or similar versions are included below. We have received hundreds of requests for the tool and additional use of the tool can be found in other published literature. We also acknowledge the assistance of several of our pain colleagues including Pam Kedziera, Judy Paice, Deb Gordon, June Dahl, Hob Osterlund, Chris Pasero, Pat Coyne and Nessa Coyle in the revisions over the years. If using or publishing the tool results please cite the reference as "Knowledge and Attitudes Survey Regarding Pain" developed by Betty Ferrell, RN. PhD, FAAN and Margo McCaffery, RN, MS, FMN. (http://prc.coh.org), revised 2012.

We hope that our tool will be a useful aid in your efforts to improve pain management in your setting.

Sincerely,
Betty R. Ferrell, RN, PhD, FAAN Research Scientist

Margo McCaffery, RN, MS, FAAN Lecturer and Consultant
### Appendix 3 Participant Information sheet

<table>
<thead>
<tr>
<th>Study title:</th>
<th>Knowledge &amp; Attitudes survey regarding pain, with nurses involved in adult postoperative care in District Health Boards within the Midland Region of the North Island of New Zealand</th>
</tr>
</thead>
</table>
| Principal investigator: | Name: Dr Philippa Seaton  
Department: Centre for Postgrad Nursing Studies  
Position: Director  
Contact phone number: 03 643858 |

**Introduction**

Thank you for showing an interest in this project. Please read this information sheet carefully. Take time to consider and, if you wish, talk with family/whanau or friends, before deciding whether to participate or not.

If you decide to participate we thank you. If you decide not to take part there will be no disadvantage to you and we thank you for considering our request.

**What is the aim of this research project?**

The aim of the project is to determine registered nurses who work in postoperative care, knowledge and attitudes regarding pain management. This study has been carried out internationally but, not in New Zealand. The study will provide a snapshot of surgical nurse’s knowledge and attitudes to pain management. This will provide a foundation for any future educational direction that may need to be addressed. The literature shows that improved knowledge and attitudes of nurses regarding pain is associated with improved patient outcomes; as measured by satisfaction, less postoperative complications and less risk of developing chronic postsurgical pain.

**Who are we seeking to participate in the project?**

Participants will be registered nurses working in adult surgical areas.

**Inclusion criteria:** RN’s working in

- Adult Surgical Wards
- Adult Surgical Intensive Care Unit (ICU)
- Adult Surgical High Dependency Unit (HDU)
• Postoperative care unit for adults (PACU)

**Exclusion criteria:**

• RN’s not working in post-surgical areas  
• RN’s working in paediatric wards  
• RN’s working in private hospitals  
• Midwives  

**If you participate, what will you be asked to do?**

Participation in this study is on a voluntary basis. Confidentiality of all participants and data collection will be strictly maintained. If you consent to participate in this study you will be required to log in to REDcap, which is an online survey programme. The survey will take approximately 15 minutes to complete. It is voluntary and if there are any questions you do not wish to answer then feel free to leave them blank.

**Is there any risk of discomfort or harm from participation?**

If participation in the study highlights any areas that provoke an interest/or need in developing further knowledge of pain management, an educational link will be provided after the survey is completed to aid any further learning that you feel may be required.

**What about anonymity and confidentiality?**

Confidentiality will be maintained through the REDcap interface as there is no connection between the email address entered and the responses received. Access to the association between the individual who participated in the survey and the survey responses is restricted in the database and cannot be accessed by the project administrator.

**If you agree to participate, can you withdraw later?**

You may withdraw from participation in the project at any time up until your online submission of the survey.

**Any questions?**

If you have any questions now or in the future, please feel free to contact either:

| Name: Philippa Seaton | Contact phone number:  
Position: Director | 03 3643858  
Department: Centre for Postgrad Nursing studies |
<table>
<thead>
<tr>
<th>Name: April Hylton</th>
<th>Contact phone number: 027 5102554</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position: Master’s Degree Student</td>
<td></td>
</tr>
<tr>
<td>Department: Centre for Post Grad studies</td>
<td></td>
</tr>
</tbody>
</table>

This study has been approved by the University of Otago Human Ethics Committee (Health). If you have any concerns about the ethical conduct of the research you may contact the Committee through the Human Ethics Committee Administrator (phone +64 3 479 8256 or email gary.witte@otago.ac.nz). Any issues you raise will be treated in confidence and investigated and you will be informed of the outcome.
8.4 Appendix 4 Consent Information for Participants

Knowledge & attitudes survey regarding pain, with nurses involved in adult postoperative care in District Health Boards within the Midland Region of the North Island of New Zealand

Principal Investigator: Dr P. Seaton, philippa.seaton@otago.ac.nz Ph: 03 3643858

1. I have read the Information Sheet concerning this study and understand the aims of this research project.
2. I have had sufficient time to talk with other people of my choice about participating in the study.
3. I confirm that I meet the criteria for participation which are explained in the Information Sheet.
4. All my questions about the project have been answered to my satisfaction, and I understand that I am free to request further information at any stage.
5. I know that my participation in the project is entirely voluntary, and that I am free to withdraw from the project at any time up until online submission of the survey without disadvantage.
6. I know that as a participant I will answer the questions to the best of my knowledge and ability.
7. I know that the survey will explore knowledge and attitudes of pain management and that if the line of questioning develops in such a way that I feel hesitant or uncomfortable I may decline to answer any particular question(s), and /or may withdraw from the project without disadvantage of any kind.
8. I understand the nature and size of the risks of discomfort or harm which are explained in the Information sheet.
9. I know that when the project is completed all personal identifying information will be removed from the paper records and electronic files which represent the data from
the project, and that these will be placed in secure storage and kept for at least ten years.

10. I understand that the results of the project may be published and be available in the University of Otago Library, and I agree that any personal identifying information will remain confidential between myself and the researchers during the study, and will not appear in any spoken or written report of the study.

11. I know that there is no remuneration offered for this study, and that no commercial use will be made of the data.

12. I understand that clicking on the online link for the survey indicates my consent to participate.

__________________________  ________________________
8.5 Appendix 5

Demographic Data

Instructions:

Participant demographic information will be aggregated to provide a context to the survey data collected.

1. Please specify your age in years
   __________________

2. Gender
   __________________

3. How many years have you been a Registered Nurse (RN)?
   ________________

4. How many years of surgical experience have you had as a RN?
   ________________

5. How many hours do you work per week?
   ________________

6. Which District Health Board do you work for?
   ________________

7. What is your highest nursing qualification?

   • Bachelor Degree in Nursing
     ________________

   • Post Graduate Certificate
     ________________

   • Post Graduate Diploma
     ________________
• Masters Degree

• Phd

8. Which ethnic group do you belong to? Mark the space or spaces which apply to you.

• NZ European

• Maori

• Samoan

• Cook Island Maori

• Tongan

• Niuean

• African

• Other such as DUTCH, JAPANESE, TOKELAUNAN. Please state:

9. Country of original nurse training?

____________________
8.6 Appendix 6

Self evaluation

8. How would you rate your level of knowledge in pain management?

- Excellent __________________
- Good __________________
- Average _________________
- Fair _________________
- Poor _________________
Dr P Seaton  
Centre for Postgraduate Nursing Studies  
(Chch)  
72 Oxford Terrace, Levels 2 and 3  
University of Otago,  
Christchurch

Dear Dr  
I am again writing to you concerning your proposal entitled “Knowledge & attitudes survey regarding pain, of nurses involved in adult postoperative care in District Health Boards within the Midland Region of the North Island of New Zealand.”, Ethics Committee reference number H16/133.

Thank you to April Hylton, student investigator on the above project, for her e-mail of 11th December 2016, with attached revised documentation, addressing the issues raised by the Committee.

On the basis of this response, I am pleased to confirm that the proposal now has full ethical approval to proceed.

The standard conditions of approval for all human research projects reviewed and approved by the Committee are the following:

Conduct the research project strictly in accordance with the research proposal submitted and granted ethics approval, including any amendments required to be made to the proposal by the Human Research Ethics Committee.

Inform the Human Research Ethics Committee immediately of anything which may warrant review of ethics approval of the research project, including: serious or unexpected adverse effects on participants; unforeseen events that might affect continued ethical acceptability of the project; and a written report about these matters must be submitted to the Academic Committees Office by no later than the next working day after recognition of an adverse occurrence/event. Please note that in cases of adverse events an incident report should also be made to the Health and Safety Office:

http://www.otago.ac.nz/healthandsafety/index.html

Advise the Committee in writing as soon as practicable if the research project is discontinued.
Make no change to the project as approved in its entirety by the Committee, including any wording in any document approved as part of the project, without prior written approval of the Committee for any change. If you are applying for an amendment to your approved research, please email your request to the Academic Committees Office: gary.witte@otago.ac.nz, jo.farrondediaz@otago.ac.nz

Approval is for up to three years from the date of this letter. If this project has not been completed within three years from the date of this letter, re-approval or an extension of approval must be requested. If the nature, consent, location, procedures or personnel of your approved application change, please advise me in writing.

The Human Ethics Committee (Health) asks for a Final Report to be provided upon completion of the study. The Final Report template can be found on the Human Ethics Web Page
http://www.otago.ac.nz/council/committees/committees/HumanEthicsCommittees.html

Yours sincerely,

[Signature]
Mr Gary Witte
Manager, Academic Committees
Tel: 479 8256
Email: gary.witte@otago.ac.nz

cc. Dr P Seaton  Director, Senior Lecturer  Centre for Postgraduate Nursing Studies (Chch)
November 2016

Dr Philippa Seaton
Centre for Postgraduate Nursing
University of Otago, Christchurch

Ma te rangahau Hauora e tautoko te whakapiki ake te Hauora Maori.
All health research in Aotearoa New Zealand benefits the Hauora (health and wellbeing) of
the tangata whenua.

Thank you for taking the time to meet with me at my office at the University of Otago,
Christchurch on the 31st October 2016, to discuss your research study titled:

"Knowledge and Attitudes Survey Regarding Pain, with Nurses Involved in Adult
Postoperative Care in District Health Boards within the Midland Region of the North
Island of New Zealand".

I note that you are the Principal Investigator for this research project and that Ms April Hylton,
a post-graduate student completing the requirements for a Master's degree will be involved
with the study.

Commentary on Proposed Research Projects
Nursing knowledge and attitudes to pain has been well researched internationally, but there
is no evidence of this type of research being carried out in New Zealand. In fact, nurses have
shown to have a deficit in their knowledge and attitudes to managing postoperative pain. The
aim of this study explores nursing knowledge and attitudes to managing postoperative pain.
This a quantitative study that will be undertaken using online surveys that will be distributed to
Registered Nurses working in surgical areas in Lakes, Bay of Plenty, Taranaki, Waikato and
tairawhiti District Health Boards (DHBs) in the North Island of New Zealand. Data will be
collected online using an adapted version of the "Knowledge and Attitudes Survey Regarding
Pain" (KASRP) tool, which has been well used internationally with revision over the years to
reflect changes in pain management practice. Nurses will be invited by email either by the
researcher, or a contact person at each DHB to complete the online survey. Demographic
data will also be collected and all participant information anonymised.

Maori Health Gain
The research project measures knowledge and attitudes and allows Maori surgical nurses the
opportunity to participate in the study. Cultural considerations in caring for patients in pain
have been included and refined for use in the survey to reflect the New Zealand context. In
terms of health gain, this study may benefit Maori by exploring attitudes and/or perceptions
that may exist in surgical nursing regarding the administration and management of pain relief
for Maori and/or ethnic minority patients.

Office of the Dean – University of Otago, Christchurch
PO Box 4345, Christchurch 8140, New Zealand Tel
+64 3 364 0522 • Email dean.ouc@otago.ac.nz
www.uoc.otago.ac.nz

You also inform that studies in this area have demonstrated that improved knowledge and
attitudes of nurses in regard to pain is associated with improved patient outcomes; as
measured by satisfaction, less postoperative complications and less risk of developing chronic
post-surgical pain. This provides the appropriate context to the importance of this research topic for Maori and improving health outcomes for this population.

Consent
Issues regarding informed consent for study participants recruited to this study were discussed. With this in mind, you must ensure that Maori participants are explicitly aware that consent is for this project only.

Ethnicity
This research project does not specifically target Maori nurses, however it is likely that this study may involve a small number of Maori nursing staff. Ideally your study cohort should be reflective of the Maori surgical nursing staff within each DHB. You will also need to consider how ethnicity data will be collected for this study. It is recommended that ethnicity data is collected from each participant in accordance with the Ministry of Health guidelines, which involves the use of the Census 2013 question.

Partnership
I understand that you have consulted with Ms Marama Tauranga, Maori Advisor, Regional Health Services, Bay of Plenty District Health Board. I have recommended that you seek further direction from Marama so that the results from your study may be shared with members of Te Tumu Whakahaere (National DHB Maori Health Managers Collective).

Potential Further Support Resources
Further resources that you might want to access to strengthen your responsiveness to Maori within your research are: 1. HRC’s Nga Pou Rangahau Hauora Kia Whakapiki Ake Te Hauora Maori 2004-2008, 2. The Health Research Strategy to Improve Maori Health and Well Being 2004-2008. For regional data relating to Maori in each District Health Board (DHB) region, the District Health Board (DHB) Maori Health Profiles (2015) published by the Ministry of Health New Zealand will help to create a picture of the health status of a DHB’s population at a given time. The other reference that is available is 3. Hauora Maori Standards of Health IV: A Study of the Years 2000-2005 by Bridget Robson and Ricci Harris, Maori Health Research Unit, Wellington School of Medicine, University of Otago, Wellington. All provide Maori specific information on a range of health issues. The recent publication Tatau Kahukura: Maori Health Chart Book 2015, Ministry of Health, 2010 (3rd edition) is an update relating to the socio economic determinants of health, health status and service utilisation of the Maori population. Further references are available from the HRC’s Guidelines for Researchers on Health Research Involving Maori (page 22), www.hrc.govt.nz

Dissemination of Results
The HRC’s Guidelines for Researchers on Health Research Involving Maori, is important in terms of how your research results may contribute to Maori health gain. Therefore, it will be necessary that appropriate Maori organisations/services are aware of your findings. This should occur not only in an academic forum, but also within the community from where data is drawn. You advise that the study findings will be shared with Ms Marama Tauranga and with members of Te Tumu Whakahaere, the New Zealand Pain Society and clinical and nursing staff. In addition, all study participants will have the opportunity to access a summary of results from the study. As such, these platforms may allow an opportunity for the consideration of Maori feedback into any discussion going forward.
Ka nui tonu nga mihi,

Karen Keelan  
Kaitohutohu Rangahau Maori/Maori Research Advisor