Fourth Year Nursing Students’ Perceptions of their Preparation in Medication Management: An Interpretative Phenomenological Study.

By

Mairéad Moloney, PG. Dip. (Hons), B.Sc. (Hons), R.G.N.

Submitted in Fulfilment of the Requirements for MSc Nursing by Research and Thesis.

University of Limerick

Research Supervisors:
Dr Owen Doody and Ms Liz Kingston.

Submitted to the University of Limerick, November 2014.
Abstract

Fourth Year Nursing Students’ Perceptions of their Preparation in Medication Management: An Interpretative Phenomenological Study.

Mairéad Moloney, PG. Dip. (Hons), B.Sc. (Hons), R.G.N.

Patient safety and medication safety are inherently linked. Medication management by healthcare professionals is one area where patient safety can be protected and enhanced. It is imperative that the nursing profession actively addresses medication safety, considering that nurses are the largest group of the healthcare professional workforce. There are inherent links between nurses’ undergraduate educational preparation in medication management and patient safety. Therefore, this study explored fourth year nursing students’ educational preparation in medication management from an Irish perspective. This qualitative research study utilised an interpretative phenomenological approach to explore the students’ perceptions. Fourteen semi-structured interviews were conducted with students of the undergraduate BSc Nursing (General), BSc Nursing (Intellectual Disability) and BSc Nursing (Mental Health) programmes at the University of Limerick. Data was analysed utilising Burnard’s (2011) method of thematic content analysis. The voices and interpretations of the participants in this study were fundamental to understanding nursing students’ perceptions of their preparation in medication management and provided the foundation for this research. These perceptions were captured in the format of four themes: developing an understanding, embedding knowledge in practice, engaging in practice and accepting professional responsibility. Overall, this research highlights the importance of both the higher education institution and the clinical learning environment in nursing students’ medication management education. There is a need for a collaborative developmental approach within this education that focuses on integrating medication management throughout the students learning across their four years and a need for leadership and support within the clinical learning environment in assuming a supportive role in the students’ educational process.
Declaration

I, the undersigned declare that this thesis which I am submitting to the University of Limerick is entirely my own work and research.

Signed: _____________________________

Mairéad Moloney

20th October 2014
Acknowledgments

This research would not have been completed without the support and encouragement of many people. I would like to take this opportunity to acknowledge those individuals.

Firstly, I want to express my sincere gratitude to my supervisors Dr Owen Doody and Ms Liz Kingston for their support, guidance and patience over the past two years.

Sincere thanks to the fourth year nursing students at the University of Limerick who took the time to participate in this study.

Heartfelt thanks to my friends and colleagues at work, Kevin and Mairead, who were a constant source of support and encouragement. Yes, there were three of us in it.

On a more personal note, to my husband David and my daughter Anna I must express my deepest appreciation and love for their endless support, encouragement and understanding.
Table of Contents

Abstract ........................................................................................................................................ ii

Declaration ................................................................................................................................... iii

Acknowledgments ....................................................................................................................... iv

Chapter 1: Introduction .............................................................................................................. 1
  1.0 Introduction ....................................................................................................................... 1
  1.1 Overview of the research topic ...................................................................................... 1
  1.2 Research aims and objectives ...................................................................................... 4
  1.3 Thesis structure ............................................................................................................. 5
  1.4 Chapter summary ........................................................................................................... 6

Chapter 2: Literature review .................................................................................................... 8
  2.0 Introduction ..................................................................................................................... 8
  2.1 Search methods ............................................................................................................. 9
  2.2 Inclusion and exclusion criteria .................................................................................. 10
  2.3 Nurse registration education programmes in Ireland .............................................. 11
  2.4 Medication management ............................................................................................. 12
  2.5 Preparedness for a medication management role ....................................................... 14
  2.6 The role of higher education institutions ................................................................... 21
    2.6.1 Delivery of programmes ....................................................................................... 21
    2.6.2 Pharmacology content ......................................................................................... 29
    2.6.3 Pharmacology teacher ........................................................................................ 31
2.7 Clinical learning environment ................................................................. 32
  2.7.1 Supervision ......................................................................................... 34
  2.7.2 Learning opportunities ....................................................................... 35
  2.7.3 Collaboration ....................................................................................... 36
  2.8 Chapter summary .................................................................................... 39

Chapter 3: Research methodology .............................................................. 43
  3.0 Introduction ............................................................................................. 43
  3.1 Research aim .......................................................................................... 44
  3.2 Research objectives ................................................................................ 44
  3.3 Research design ...................................................................................... 44
    3.3.1 Quantitative and qualitative research .............................................. 45
    3.3.2 Phenomenology ............................................................................... 48
    3.3.3 Husserlian and Heideggerian approaches ....................................... 49
  3.4 Access ..................................................................................................... 53
  3.5 Ethical considerations ............................................................................ 54
    3.5.1 Beneficence ....................................................................................... 56
    3.5.2 Respect for persons .......................................................................... 57
    3.5.3 Justice ............................................................................................... 59
  3.6 Sampling .................................................................................................. 60
  3.7 Data collection ......................................................................................... 63
  3.8 Pilot study ............................................................................................... 67
  3.9 Data analysis ........................................................................................... 68
3.10 Rigor .................................................................................................................... 72
  3.10.1 Credibility ..................................................................................................... 72
  3.10.2 Dependability ............................................................................................... 74
  3.10.3 Confirmability ............................................................................................... 75
  3.10.4 Transferability ............................................................................................... 75

3.11 Chapter summary ................................................................................................. 75

Chapter 4: Presentation of findings ............................................................................. 78

  4.0 Introduction ............................................................................................................ 78
  4.1 Findings ................................................................................................................. 79
  4.2 Developing an understanding ................................................................................ 80
    4.2.1 The meaning of medication management ....................................................... 81
    4.2.2 Wider issues in medication management ......................................................... 82
  4.3 Embedding knowledge in practice ......................................................................... 83
    4.3.1 The pharmacology module .............................................................................. 84
    4.3.2 Clinical placement ........................................................................................... 88
    4.3.3 Technology enhanced information sources ..................................................... 89
  4.4 Engaging in practice .............................................................................................. 91
    4.4.1 Preceptorship and support ............................................................................... 93
    4.4.2 Clinical learning environment ......................................................................... 95
  4.5 Accepting professional responsibility .................................................................... 99
    4.5.1 Future medication management role ............................................................. 100
    4.5.2 Responsibility for own learning ................................................................. 101
Chapter 5: Discussion of findings ................................................................. 105

5.0 Introduction ................................................................................................. 105

5.1 Developing an understanding ........................................................................ 105

5.1.1 The meaning of medication management .............................................. 105

5.1.2 Wider issues in medication management .............................................. 108

5.2 Embedding knowledge in practice .............................................................. 110

5.2.1 The pharmacology module ................................................................. 111

5.2.2 Clinical placement .............................................................................. 115

5.2.3 Technology enhanced information sources ...................................... 117

5.3 Engaging in practice .................................................................................. 120

5.3.1 Preceptorship and support ................................................................. 120

5.3.2 Clinical learning environment ............................................................ 124

5.4 Accepting professional responsibility ....................................................... 127

5.4.1 Future medication management role ................................................... 128

5.4.2 Personal responsibility for learning .................................................... 129

5.5 Limitations of the study ........................................................................... 130

5.6 Chapter summary ....................................................................................... 131

Chapter 6: Recommendations and conclusion ............................................. 134

6.0 Introduction ................................................................................................. 134

6.1 Significant findings of the study .............................................................. 134

6.2 Recommendations ................................................................................... 137
Chapter 1: Introduction
Chapter 1: Introduction

1.0 Introduction

This chapter introduces the research topic. Rationale for the research study, with an overview of the research aim and objectives is presented. The structure of the thesis is outlined.

1.1 Overview of the research topic

In 21st century global healthcare systems, patient safety is a major concern (Steven et al. 2014). Delivering safe care in complex, pressurised, fast-moving environments is a great challenge for health care professionals (Adhikari et al. 2014). Global healthcare challenges such as inequalities, social exclusion, climate change, urbanisation and an aging population means that the provision of safe and effective healthcare has become a major priority (Buscher et al. 2009, Ndosi and Newell 2008).

The World Health Organisation identified ‘medication safety’ as an integral aspect of patient safety (World Health Organisation 2011). In recent years, the meaning of the term ‘medication safety’ has evolved and become more expansive. Initially it was concerned with ‘adverse drug reactions’ which are unintended, harmful reactions to normal doses of medicines used to treat specific conditions. However, it has now expanded to include ‘medication errors’ which involves medicine administered to the wrong patient in error or the wrong dose, time or route used (World Health Organisation 2008). It is estimated that over 50% of all medicines are prescribed, dispensed or administered inappropriately (World
Health Organisation 2011) resulting in life-threatening and clinically significant medication error rates which are as high as 31% (Smith et al. 2008). Medication errors can have major consequences for the patient and for the healthcare worker who committed the error (Sulosaari et al. 2010). An adverse drug event arising from a medication error is associated with prolonged hospital stays, increased economic burden and an almost twofold increased risk of death (Bates et al. 2010). The statistics relating to current medication safety practices are harrowing and well documented in the literature (Sulosaari et al. 2010, Brady et al. 2009, Page and McKinney 2007, Armitage and Knapman 2003, O'Shea 1999). Therefore, in the global context, medication safety is an urgent challenge for healthcare workers (World Alliance for Patient Safety 2008), and one which requires interdisciplinary co-operation (Sulosaari et al. 2012, World Alliance for Patient Safety 2008).

Medication management by healthcare professionals is one area where patient safety can be protected and enhanced (Adhikari et al. 2014, Meechan et al. 2011). Medication management encompasses all the activity that is involved in meeting the needs of a person who is prescribed medication (Hemingway et al. 2011) and involves a multidisciplinary approach by doctors, pharmacists, nurses and patients (Adhikari et al. 2014). It is well established in the literature that the ultimate goal of medication management is to optimise medication use and improve health outcomes for patients (Liu et al. 2014, Adhikari et al. 2014).

It is imperative that the nursing profession actively addresses medication safety as they are the largest group of the healthcare professional workforce and medication administration is predominately a nursing responsibility (Hemingway et al. 2011,
Sulosaari et al. 2010, Brady et al. 2009). It is estimated that up to 40% of nurses’ time is spent on medication management related activities (Armitage and Knapman 2003). The factors that contribute to medication safety in nursing are well documented and are described as ‘system factors’ and ‘individual factors’ (Sulosaari et al. 2010, Brady et al. 2009, McBride-Henry and Foureur 2006, Armitage and Knapman 2003, O'Shea 1999). System factors include the nurses’ busy workload and inadequate staffing levels. Individual factors include stress, length of work experience and competence related factors such as mathematical skills, knowledge of pharmacology and an ability to contextualise the medication management needs of individual patients (Brady et al. 2009).

There are inherent links between nurses’ undergraduate educational preparation in medication management and patient safety (World Health Organisation 2011). The complexity of medication management and its intricate relationship with patient safety means that nurses must be educated to a very high standard in this process (Manias 2009). However, some literature suggests that nurses are unprepared for their medication management roles and their knowledge in this area is not adequate for the delivery of safe medication care (Meechan et al. 2011, Honey and Gigi Lim 2008, Manias and Bullock 2002a, Manias and Bullock 2002b). These findings invariably raises questions about the role of current educational models in preparing undergraduate nurses for practice (Hemingway et al. 2011).

In Ireland, models of nurse education have undergone fundamental changes (Deasy et al. 2011). Nurse training moved from certificate/apprenticeship programmes to three year registration/ diploma programmes in 1994. The four
year registration/degree programmes were introduced in 2002 (An Bord Altranais 2005). The Nursing and Midwifery Board of Ireland provide guidelines to assist nurses and midwives to understand their roles and responsibilities in medication management. These guidelines are presented in the document ‘Guidance to Nurses and Midwives on Medication Management’ (An Bord Altranais 2007a). Accordingly, medication management has been an integral aspect of the undergraduate BSc Nursing programmes for many years. However, literature addressing nurses’ educational preparation for a medication management role is limited (Cleary-Holdforth and Leufer 2013). It has been reported that nursing students perceive the comprehensives of medication management in their undergraduate programmes as inadequate (King 2004). At present, there are no national or international guidelines on the amount or level of medication management content required within undergraduate nursing curricula (Fleming et al. 2014). Furthermore, there are is an absence of literature and qualitative studies exploring nursing students’ perceptions of their educational preparation in this area. Therefore, this research study aimed to explore Irish fourth year nursing students’ perceptions of their preparation in medication management. By capturing and representing the voices and interpretations of nursing students in this study, it is hoped that findings will contribute to future nurse registration education programmes, which have patient safety issues at their core.

1.2 Research aims and objectives

This research study aimed to explore fourth year nursing students’ perceptions of their preparation in medication management. To meet this aim, research objectives were identified as follows:
- To explore students’ perceptions of their educational preparation in medication management during their time in the higher education institution.
- To explore students’ perceptions of their educational preparation in medication management during their time in the clinical learning environment.
- To highlight students’ perspectives of factors that facilitated or hindered their learning in medication management.

1.3 Thesis structure

This chapter presented an overview of the research topic and the aims and objectives of the study were outlined. Chapter two presents the literature review where current national and international literature regarding nurses’ preparation in medication management is appraised. Chapter three presents the research design. This research study is qualitative in nature and utilises an interpretative phenomenological approach, an approach suited to meeting the research aims and objectives. Chapter four illustrates the findings from this study. These findings are presented in four themes which capture participants’ perceptions about the phenomenon in question. They are developing an understanding, embedding knowledge in practice, engaging in practice and accepting professional responsibility. In chapter five, a discussion and critical analysis of the findings in relation to national and international literature is presented. The limitations of the study are acknowledged. Finally, chapter six summarises significant findings of the study and presents recommendations based on the research findings.
1.4 Chapter summary

This introductory chapter outlined an overview of the research topic and presented the research aims and objectives. The structure of the thesis was outlined. There are inherent links between healthcare professionals educational preparation and patient safety (Steven et al. 2014). Nurses need to be educated to a very high standard in medication management in order to deliver effective and safe patient care. The voices and interpretations of the participants in this study were fundamental to understanding nursing students’ perceptions of their educational preparation in medication management and it is hoped that the findings will contribute to future nurse registration education programmes at a national and international level.
Chapter 2: Literature review
Chapter 2: Literature review

2.0 Introduction

This chapter presents the literature review. A literature review provides relevant, up to date information regarding the knowledge and research available on a topic (Parahoo 2014). The aim of this research study was to explore nursing students’ perceptions of their educational preparation in medication management. Patient safety is inherently linked with medication safety (World Health Organisation 2011) and medication management is an area where medication safety can be maximised (Vaismoradi et al. 2014). The complexity of medication management and its intricate relationship with patient safety means that nurses must be educated to a very high standard in this process (Aggar and Dawson 2014). From a nursing standpoint there are many complex factors which contribute to medication safety. One such factor is the effectiveness of nurse registration education programmes in the preparation of nurses for this role (Sulosaari et al. 2010).

The purpose of this chapter is to review literature related to the preparation of nursing students in medication management. This chapter provides an overview of the existing knowledge on this topic and sets this research study in context (Newell and Burnard 2011). An overview is provided through summary and narrative review of relevant national and international literature. In the following pages, an overview of nurse registration education programmes in Ireland is provided. Following this, a description of the term ‘medication management’ and the nurses’ role in medication management is offered. National and international literature regarding nurses’ preparedness for a medication management role is
presented. Finally, literature regarding the role of higher education institutions and the role of clinical learning environments in preparing undergraduate nursing students for medication management is reviewed. The literature search methods and the criterion used to include or exclude research studies are described below.

2.1 Search methods

A comprehensive review of the literature was undertaken. The literature was sourced at the University of Limerick library comprising of books and electronic databases such as CINAHL, Medline, PubMed, the Cochrane library, Science Direct and Google Scholar. To source the relevant literature pertaining to this study, databases were searched by cross referencing the terms ‘medication management and nursing’, ‘medication administration and nursing’, ‘medication competence and nursing’, ‘pharmacology and nursing’, and ‘undergraduate nursing students’. The terms ‘pharmacology’ and ‘medication management’ were used in the search strategy, as both terms are used in the literature. This search resulted in a large body of published literature which was initially scanned in terms of journal article title, abstract and article content. This process reduced the volume of literature relevant to this study.

A hand search of reference lists of relevant published papers was also conducted. The search was limited to the years 1996-2014, as 1996 was the earliest published paper found to meet the inclusion criteria. An additional search for relevant publications and policy documents was undertaken within the following websites – Nursing and Midwifery Board of Ireland, Department of Health, Health Service Executive and the World Health Organisation.
Initial results revealed a dearth of Irish studies pertaining to the topic under exploration, therefore this chapter offers a review of relevant national and international literature. The criterion used to include or exclude research studies is presented below.

2.2 Inclusion and exclusion criteria

Research studies which addressed nurses’ educational preparation in medication management and literature which described or explained medication management were included in this review. The experiences and/or perceptions of key stakeholders (nursing students, new graduates, registered nurses, lecturers and clinical preceptors) were also included to broaden the perspective of the review.

Research studies concerned with medication management related to specialised areas of nursing practice were excluded, for example intensive care nursing and cancer care nursing. Examination of medication management issues of this nature were outside the scope of this literature review due to their highly specific nature which addressed nursing challenges at an advanced level of practice. Twenty-five published papers were identified that met the inclusion criteria, this included eleven studies with quantitative methodologies, nine studies with qualitative methodologies and three with mixed methods methodologies. One discussion paper and one literature review were also included (see appendix G for a chart of published papers included in this literature review).

In the next section, to put this research study in context, an overview of nurse registration education programmes in Ireland is presented.
2.3 Nurse registration education programmes in Ireland

In Ireland, models of nurse education have undergone fundamental changes, particularly with the move of undergraduate nursing education into higher education institutions in 2002 (Deasy et al. 2011). Presently in Ireland, nurse registration education programmes are four year undergraduate degree programmes which take place at approved higher education institutions and their health service partners within the Health Service Executive. Successful completion of a programme in General, Psychiatric or Intellectual Disability nursing, results in registration as a nurse with the Nursing and Midwifery Board of Ireland and the award of a primary degree from the affiliated higher education institution (An Bord Altranais 2005).

In 2012, a review of undergraduate nursing and midwifery programmes was commissioned by the Minister for Health to examine the efficiency and effectiveness of programmes in preparing nurses for practice. The review group recommended that the Nursing and Midwifery Board of Ireland build on the strengths of current programmes, aligning these with future patterns of healthcare delivery (Department of Health 2012). As a result of the review, several recommendations for education programme evaluation and curriculum review were presented. Recommendation E1 proposed education programme evaluation in terms of design, content and delivery (Department of Health 2012). Specifically it was recommended that higher education institutions and their health service partners should put in place systems to capture feedback from nursing students and midwives to inform the design, content and delivery of education programmes (Department of Health 2012).
At present in Ireland, the design, content and delivery of medication management within undergraduate nursing curricula is unclear (Fleming et al. 2014, Cleary-Holdforth and Leufer 2013). There is an absence of literature and qualitative studies exploring nursing students’ perceptions of their educational preparation in this area. Therefore, this research study aimed to explore the perceptions of undergraduate nursing students in relation to their preparation in medication management. It is hoped that findings will contribute to nursing education in this area. As this research study addressed medication management, it was important to explain this term, a description is provided below.

2.4 Medication management

In this research study the term medication management and the word pharmacology are used. Medication management is the term used in the title and throughout this thesis as it encompasses the nursing roles and responsibilities with regard to medication. It is also the term used by the Nursing and Midwifery Board of Ireland (An Bord Altranais 2007a). However, the word pharmacology is also used, particularly when addressing the pharmacology education of nurses in higher education institutions. Pharmacology is the science that addresses the properties and characteristics of medicines (Galbraith et al. 2007) and how they work in the human body (McFadden 2014). At an undergraduate level, nursing students are exposed to pharmacology teaching and learning in nursing curricula. To fulfil a role in medication management, nurses need comprehensive pharmacology knowledge, which involves understanding the scientific principles

---

1 In 2012, The Nursing Board (An Bord Altranais) changed its name to The Nursing and Midwifery Board of Ireland (Bord Altranais agus Cnáimhseachais na hÉireann). This change of name reflected the recognition of midwifery as a separate and distinct profession to that of nursing.
underpinning medications as well as the ability to contextualise medication management to the complex needs of patients (Manias and Bullock 2002a). In this research study, participants were exposed to a pharmacology module in the higher education institution during the second year of their undergraduate programme.

In the following paragraphs, medication management is described and the role of the nurse in this multistage process is outlined. Medication management is a complex multidisciplinary process (Adhikari et al. 2014). The key players involved are patients, nurses, midwives, doctors and pharmacists (An Bord Altranais 2007a). With regard to nursing, medication management is an important aspect of registered nurses’ roles and responsibilities and accordingly it is accompanied by legal requirements to maximise patient safety. In Ireland, these requirements are provided by the Nursing and Midwifery Board of Ireland who describe medication management as the facilitation of safe and effective use of prescription and over-the-counter medicinal products (An Bord Altranais 2007a). Simply put, medication management is an interaction between nurses, patients and the patients medications (Manias et al. 2005).

Nurses’ responsibilities in medication management include assessment, planning, implementation and evaluation in collaboration with other key healthcare professionals. Furthermore, knowledge of prescribing, dispensing, storing, supplying and administering medicinal products is an obligation of every registered nurse (An Bord Altranais 2007a). However, safe medication management is more than just a technical mechanical process (Leape et al. 1995). The nurses’ role in medication management is complex (Manias and Bullock 2002a) and involves cognitive skills such as decision making and professional
judgement, as well as psychomotor skills like preparation and administration of medicines (Brady et al. 2009).

Nurses are the last link in the safety net to prevent medication errors and enhance patient safety (Vaismoradi et al. 2014, Leape et al. 1995). Therefore, nurses must be educated to a very high standard in medication management (Aggar and Dawson 2014). However, the literature suggests that nurses report deficiencies in their preparation for this role (Meechan et al. 2011, Honey and Gigi Lim 2008, Manias and Bullock 2002a, Manias and Bullock 2002b). This invariably raises questions about the role of current educational models in preparing nurses for practice (Hemingway et al. 2011).

On review of the literature, factors within higher education institutions and within clinical learning environments which influenced nursing students’ preparation in medication management were identified as key themes pertinent to this topic. Therefore, these themes were used to structure the literature review. A narrative review of research studies in relation to methodological considerations as well as findings is presented. In the following section, literature regarding the preparedness of nurses for a medication management role is explored.

2.5 Preparedness for a medication management role

It is suggested that nurses feel unprepared for their role in medication management and report deficiencies in their educational preparation (Meechan et al. 2011, Honey and Gigi Lim 2008, Manias and Bullock 2002b, Manias and Bullock 2002a). Literature is reviewed below to ascertain what is currently known about the perceived and actual preparedness of nurses in medication management.
Most of the studies reported on below predominantly address the preparedness of registered nurses for a medication management role. There is a dearth of research examining nursing students’ preparedness. However, given that there are inherent links between undergraduate education and nurses’ aptitudes in medication management (Manias and Bullock 2002b) it was appropriate to include these studies.

Almost twenty years ago, Ives et al. (1996) explored the pharmacology knowledge of registered nurses in Australia. Respondents (n=363) to a postal questionnaire were asked to self-rate their knowledge of five categories of pharmacology and to answer questions on each category. The mean test score was 55.8% (range 16% to 92%). Higher scores were associated with longer experience as registered nurses and related to whether or not respondents had participated in a graduate nurse programme. When self-rated test scores were compared with actual overall scores, it was found that participants had overestimated their pharmacological knowledge. It was concluded that newly qualified nurses had inadequate knowledge of pharmacology (Ives et al. 1996). This large-scale study was significant as it was the first to explore self-rated and actual pharmacology knowledge of nurses. However, considering its date, it is unlikely to be representative of nurses’ pharmacology knowledge in current times.

More recently, a qualitative study by Manias and Bullock (2002b) explored clinical nurses’ perceptions and experiences of graduate nurses’ pharmacology knowledge. Data collection involved six focus group interviews with clinical nurses (n=36) from four different hospitals in Australia. It was reported that graduate nurses and indeed experienced nurses had deficits in their pharmacology
knowledge. This was attributed to an unstructured approach to learning pharmacology at an undergraduate level and to an unstructured approach to addressing the continuing education needs of graduate nurses. Participants believed that graduate nurses’ preparation in pharmacology could be greatly improved by a reorganisation of undergraduate nursing curricula. How undergraduate nursing curricula could be reorganisation was not made explicit in this study. However, it was suggested that any reorganisation should be complemented by self-directed initiatives and lifelong practices. This study was limited by a small sample size across four hospitals. Therefore findings may not be generalisable internationally.

A Finnish study by Grandell-Niemi et al. (2005) explored the pharmacological skills of nurses. Similar to earlier work by Ives et al (1996), this study evaluated self-rated and actual pharmacological skills. Respondents included registered nurses (n=364) from seven hospitals and graduating nursing students (n=282) from five educational institutions. This represented a 68% response rate for registered nurses and a 70% response rate for students. A questionnaire and a ‘medication calculation skills test’ were developed as the data collection instrument. Findings indicated that nurses and students had some deficiencies in their pharmacological skills. Results from the self-rated aspect of the questionnaire indicated that both nurses and students found pharmacology difficult, particularly knowledge of pharmacokinetics and pharmacodynamics. A minority of nurses (37%) and nursing students (18%) rated their skills as sufficient. In relation to the MCS test, over half of nurses scored 79% or higher, which was considered adequate. However, nursing students did not perform as well, with over half achieving a mean score of 67%. Similar to Morrison-Griffiths
et al. (2002) and Ives et al. (1996) nurses scored better than students according to both self and actual ratings indicating that learning pharmacology actually takes place in the clinical practice. However, students in the study by Bullock and Manias (2002) did not concur with the view that learning pharmacology occurred in clinical practice. While findings from this large scale study may be generalised to Finland, they may not be representative of nurses at an international level. Furthermore, as the MCS test was developed specifically for this study, its reliability was not confirmed.

In New Zealand, Honey and Gigi Lim (2008) conducted a qualitative study with final year undergraduate nursing students to explore perceptions of clinical practice situations where they applied, or were not able to apply, their pharmacological knowledge. A survey consisting of two open ended questions was the data collection method. A response rate of 90 % (n=54) was achieved. Findings demonstrated that 85% of students felt they used their pharmacology knowledge in their clinical placement and they recognised the importance and relevance of pharmacology in their practice. Despite this, respondents did perceive a lack of confidence in their ability to apply pharmacology knowledge and felt unprepared for their roles in medication management. It was reported that the majority of barriers to learning were linked to the clinical context. This small scale study was limited by a sample from one educational institution and may not be generalisable internationally. It was interesting that this study was conducted as part of a course evaluation and this might explain the high response rate.

Ndosi and Newell (2008) conducted a study to determine if nurses had adequate pharmacology knowledge of the medications they commonly administer. This
study utilised structured interviews and a questionnaire to gather data from nurses working in surgical wards at a hospital in the north of England. Participants comprised of junior nurses (n=18) and senior nurses (n=24) representing a 43% response rate. It was reported that 26% of nurses in this study had adequate pharmacology knowledge while the majority of nurses (74%) had insufficient knowledge. While knowledge of dosage indications and drug side effects were satisfactory, knowledge of the mechanism of action and drug interactions was extremely poor. Similar to Ives et al (1996), there were correlations between knowledge and experience, with more senior nurses with longer experience scoring higher. This study was limited in that it had a relatively small sample size from a single centre study and therefore findings may not be generalizable. Furthermore, there was underrepresentation of junior nurses. However, given the correlations between knowledge and experience, it is unlikely that greater representation of junior nurses would have yielded more favourable results. Despite these limitations, the findings of this UK study are consistent with the Australian study by Ives et al (1996) highlighting that nurses’ pharmacology knowledge is below the expected standard and similar to Grandell-Niemi et al (2005) it concluded that nurses are unprepared for their medication management roles.

Dilles et al. (2011) evaluated graduating nursing students’ pharmacological knowledge by cross-sectional survey using a ‘medication knowledge and calculations test’. Thirty-eight nursing schools were surveyed, eighteen of which offered bachelor’s degrees and twenty of which offered diplomas. The response rate achieved was 45% of nursing students (n=613) across twenty five nursing schools. General scores on the ‘medication knowledge and calculations test’
indicated that graduating nursing students had limited pharmacological knowledge and deficits in medication calculation skills. It was concluded that nursing students’ pharmacological knowledge was limited and was not adequate for the delivery of safe medication care. The sample in this study was large and representative of nursing schools in Belgium, however findings may not be generalisable internationally. This study also highlighted that bachelor’s degree students scored higher in the medication knowledge and calculations tests, whether or not this was related to the curriculum approach in bachelor’s degrees was not obvious in this study.

An Irish study by Fleming et al. (2014) evaluated the medication calculation skills of registered nurses. A cross-sectional survey of registered nurses (n=228) commencing employment and undertaking nurse orientation programmes at five major academic teaching hospitals was conducted. A response rate of 58% representing 124 registered nurses was achieved. A two part questionnaire involving qualitative questions (part one) and a medication calculation test (part two) was utilised.

In part one of the questionnaire, findings indicated that participants perceived practical experience as the most common way in which they learned about medication calculations. The pathways identified by participants for improving the medication calculation skills of nurses included practice-based education on drug calculations and greater emphasis on teaching and testing medication calculation in pre-registration nurse education. In the medication calculation test respondents achieved a mean overall score of 60.08%, with 4% achieving a perfect score. Results indicated that that the most frequent type of calculation
errors were attributed to conceptual errors (for e.g. not utilising the standardised formulae for calculating drip rates) rather than maths skills.

This study contributes information from an Irish perspective on this topic. However, aspects of the questionnaire were developed specifically for this survey and would have benefited from further validation. Also the sample consisted of registered nurses commencing employment with an average mean experience of seven years as a registered nurse. Therefore, findings may not be representative of all Irish nurses and particularly not generalisable to junior nurses or nursing students.

Having reviewed the literature, qualitative and quantitative data would suggest that some nurses are unprepared for their role in medication management. However, it is pertinent to highlight that with few exceptions, most studies which aim to evaluate nurses’ preparedness for this role involve questionnaires which address mathematical skills and calculation tests. These skills are integral to medication safety and reports indicated that nurses are deficient in this area. However, medication management is a complex phenomenon and mathematical/calculation skills are just one fragmented aspect of nurses’ competence in this area (Sulosaari et al. 2010). Furthermore, there is a dearth of research examining nursing students’ preparedness for this role as most studies focus on registered nurses.

Inherent links between undergraduate education and nurses’ aptitudes are evident (Manias and Bullock 2002b). Deficiencies in nurses’ medication knowledge and skills invariably raises questions about the role of educational models in preparing
undergraduate nursing students for practice (Hemingway et al. 2011). Nurse registration education programmes encompass learning in higher education institutions and learning in clinical learning environments and thus is influenced by the contexts of both (Budgen and Gamroth 2008). Together, both aspects are important in preparing nursing students for the role of registered nurse (Josen et al. 2013). Therefore, it is appropriate to review the literature to ascertain the role each one plays in nurses’ preparation in medication management. The discussion now moves to the role of the higher education institutions.

2.6 The role of higher education institutions

In this section, factors within higher education institutions which influence the preparation of nursing students in medication management are explored. Preparation for a medication management role often begins with pharmacology teaching and learning in the higher education institutions. There is much debate in the literature about what constitutes best practice regarding educational programmes for nurses in this area. Such debate revolves around the issue of the delivery of programmes and the content of programmes. Furthermore, there is divided opinion as to who should teach pharmacology to nursing students. In the absence of Irish studies, international literature regarding these issues is reviewed.

2.6.1 Delivery of programmes

The literature suggests two main approaches to the delivery of pharmacology. These include a dedicated module in pharmacology or an integrated approach where pharmacology content is interwoven with other modules. There is intense debate in the literature as to which method is best in preparing nurses who are ‘fit
for purpose’ when it comes to real life practice (Gigi Lim and Honey 2006). International literature regarding the delivery of pharmacology education for nursing students is reviewed below.

A UK study by Latter et al. (2000) evaluated the educational preparation of nurses for a health education role, particularly focusing on the nurses’ role in patient education regarding medications. This case study design research involved multiple methods of data collection at three educational institutions involving nursing students, lecturers and practitioners with expertise in the area of medication management. While the delivery approach to pharmacology was not stated explicitly in the findings, this study highlighted a lack of consistency and fundamental flaws in the delivery of pharmacology across nursing programmes in the three educational institutions (for e.g. a lack of opportunities to integrate pharmacology knowledge and skills and unclear learning outcomes within curricula). However, further work by the same authors, Latter et al. (2001) provided more information on programme delivery in the UK. A national survey of fifty-one education institutions in the UK provided a national overview of curriculum design and delivery related factors of pharmacology within pre and post registration nursing education. Respondents were either programme leaders or senior lecturers. A response rate of 84.5% of the institutions was achieved, this represented 141 respondents. Findings highlighted a general dissatisfaction with pharmacology education in pre and post registration curricula. This was related to the fact that the predominant model of teaching pharmacology was by integrating it within other modules rather than as a stand-alone module. Pharmacology was integrated with either a biological science subject or a nursing subject module. It is interesting to note that while respondents were dissatisfied with the amount of
time spent on teaching pharmacology, most did not feel it should be taught as a separate module.

Another UK study by Morrison-Griffiths et al. (2002) surveyed fifty two educational institutions in England with the aim of identifying curriculum design and content of undergraduate nursing education regarding their pharmacology content. This study was similar to Later et al (2001) however the focus of this study was solely on pre-registration nursing education. Respondents from thirty-six education institutions were senior lecturers (n=36) responsible for undergraduate nurse education and this represented a 69.2% response rate. Findings from this study concur with Latter et al. (2001) in that the common approach to teaching pharmacology to nursing students in the UK was via integrated teaching rather than a dedicated module. However, it was highlighted that the teaching of pharmacology varied greatly between educational institutions and suggested that nursing students were inadequately prepared for a role in medication management. Therefore, a separate module approach to teaching pharmacology was advocated. Although this study surveyed all educational institutions providing nursing education in the UK, the sample was limited to educators. The inclusion of other key stakeholders, such as students, would have offered a broader viewpoint.

King (2004) explored nurses’ pharmacology education needs. This qualitative study utilised semi-structured interviews to collect data from qualified nurses (n=10) at one clinical setting in the north of England. Findings concurred with previous findings (Manias and Bullock 2002a, Latter et al. 2000), in that nurses were dissatisfied with their educational preparation in pharmacology and this was
linked to a perceived lack of time, lack of structure and over-emphasis on other modules in undergraduate nursing curricula. Similar to Latter et al (2001), lectures anticipated that the integrated approach would help to consolidate knowledge. However, students expressed a desire for a dedicated pharmacology module. Students perceived that an integrated approach encouraged superficial learning and made linking theory and practice more difficult. The small sample size and single location of this study limit its findings.

There are similar findings from Australia regarding the delivery of pharmacology content within undergraduate nursing education. Bullock and Manias (2002) surveyed lecturers (n=78) in thirteen universities in Victoria, Australia. The study explored lectures’ perceptions and experiences of teaching and learning pharmacology in preregistration nursing programmes. Findings indicated variances between educational institutions with regard to the number of hours and the timing of the pharmacology component of programmes. The preferred model of teaching pharmacology was to integrate it with nursing or biological science modules. However, there was dissatisfaction with the preparation of nursing students with respect to their pharmacology knowledge base. The results of this survey were limited due to a low response rate of 34% and it was also notable that all lectures who responded in this study were also registered nurses.

Further work by Manias and Bullock (2002a) involved a qualitative study which included nursing students’ perspectives and lecturers’ perspectives regarding educational preparation in pharmacology. In this study, fourteen focus group interviews were conducted at ten different university settings in Australia. This involved focus group interviews with academic staff (n=16) and students (n=43).
Similar to findings by Latter et al (2001), it was revealed that seven out of ten universities had integrated programmes of pharmacology. However, the authors reported that in the universities without a dedicated pharmacology module, very little emphasis was placed on pharmacological principles in integrated subjects. The authors concluded that an integrated approach to teaching pharmacology encouraged students to adopt superficial learning processes which led to difficulties in linking theory and practice. Based on findings, one of the recommendations of the study was that pharmacology should be taught as a separate subject with integrated components.

More recent data from Australia was provided by Manias (2009) in an editorial addressing the pharmacology content in undergraduate nursing programmes. It was reported that of thirty universities providing undergraduate nursing programmes in Australia, sixteen had no module in pharmacology, seven had pharmacology content combined with other modules and seven had dedicated pharmacology modules. It was concluded that the teaching and learning of pharmacology for undergraduate nursing students warrants immediate attention (Manias 2009).

In Belgium, Dilles et al. (2011) evaluated graduating nursing students’ pharmacological knowledge. Thirty-eight nursing schools were surveyed, eighteen of which offered bachelor’s degrees and twenty of which offered diplomas. As nurse education in pharmacology was not predefined in Belgium, this study gathered information by a questionnaire to identify organisational and content characteristics of pharmacology curriculum. Twenty-nine nursing schools responded representing a response rate of 76%. Results indicated a large
divergence in pharmacology education organisation between schools. Sixteen schools integrated pharmacology into other modules of the general curriculum and thirteen schools had a separate pharmacology module. The amount of hours dedicated to pharmacology varied greatly and the pharmacology teachers were nurses, pharmacist or physicians. Similar to previous findings (King 2004, Bullock and Manias 2002, Morrison-Griffiths et al. 2002, Latter et al. 2001) a lack of consistency in the content and the time dedicated to pharmacology was reported. The second part of this survey evaluated graduating nursing students’ (n=613) pharmacological knowledge using a medication knowledge and calculations test which was developed specifically for this study. Results indicated that nursing students’ pharmacological knowledge was limited and was not adequate for the delivery of safe medication care.

Sulosaari et al. (2013) conducted a national study in Finland to explore curriculum content, teaching and evaluation methods with regard to medication education in nursing. Questionnaires were used to collect data from programme managers responsible for curriculum (n=22), representing a 78% response rate and from teachers involved with medication education (n=136), representing a 54% response rate. Results showed that the most common curricular approach to medication education was by integrating it into other modules. Similar to other studies there was great variations between nursing programmes regarding the content and time devoted to the pharmacology (Dilles et al. 2011, Morrison-Griffiths et al. 2002, Bullock and Manias 2002, Latter et al. 2001).

Fleming et al. (2014) surveyed thirteen higher education institutions providing the nurse registration education programmes in Ireland. The aim was to determine the
organisation of pharmacology education within curricula, particularly related to medication calculation skills. A 53% response rate was achieved and it was reported that integrating pharmacology within and across modules was the preferred curricular structure, however it was difficult to estimate the amount of hours devoted to the subject because of the integrated approach. Overall, results indicated that there were inconsistencies in the amount of pharmacology within nursing curricula in Ireland. Seven of thirteen higher education institutions responded, therefore the findings may not be generalizable to all higher education institutions in Ireland.

Despite considerable debate, little is known about how nurses should be educated with regard to pharmacology. There is little comparative evidence of the efficacy of either a dedicated or integrated approach to pharmacology education for nursing students (Manias 2009). Meechan et al. (2011) investigated the efficacy of a fourteen month integrated pharmacology and medicines management curriculum for undergraduate nursing students. This study compared two groups of nursing students, the first group were exposed to the usual curriculum (control group, n=60) while the second group (intervention group, n=60) experienced a new integrated pharmacology and medicines management curriculum. Response rate was 100% as no student declined to participate. The impact of the curriculum was assessed by using a short answer questionnaire. Results demonstrated that students exposed to the new integrated curriculum were better able to apply pharmacological knowledge than the control group. It was concluded that early introduction of an integrated approach to the teaching and assessing of pharmacological processes improved students’ knowledge. However, a relatively small sample from one setting limits these findings. Also, the curriculum
approach for the control group was not entirely clear. However, this study was significant as it used a comparative design to investigate the efficacy of different approaches to curriculum design.

It is evident from international literature including reports from Ireland, United Kingdom, Australia, Belgium and Finland that pharmacology is primarily taught to nursing students as an integrated component of curricula as opposed to a dedicated programme (Sulosaari et al. 2013, Dilles et al. 2011, Morrison-Griffiths et al. 2002, Manias and Bullock 2002a, Latter et al. 2001). It is also evident that there are conflicting views as to whether or not this approach prepares students for practice. The literature supports the notion that undergraduate nursing students are unprepared for the medication management role expected of them as registered nurses (King 2004, Manias and Bullock 2002a). Yet, the delivery, organisation and structure of nursing curricula for pharmacology education remain contentious. Morrison-Griffiths et al. (2002) advocated a module approach to teaching pharmacology, one which would provide a sound knowledge base upon which students may build. Manias and Bullock (2002b) advocated a combined approach where pharmacology is taught as a separate module with integrated components throughout other modules. Meechan et al. (2011) while also highlighting the merits of an integrated curriculum approach recommended that students should be exposed to a more structured teaching approach which was aligned throughout the curriculum.

As well as the organisation and structure of pharmacology curricula, divergent views regarding the content of curricula and who is best placed to deliver this
content are also evident in the literature. Literature regarding these issues is presented below.

2.6.2 Pharmacology content

The content of pharmacology education for nurse registration education programmes is also debated in the literature. Just under twenty years ago, Wynne et al. (1997) suggested that the rejection of the biomedical model of nursing in favour of the philosophy of holism may be detrimental to the preparation of future nurses who are fit for purpose. This debate is still on-going, particularly so in relation to medication management.

Findings from Latter et al (2000) and Latter et al (2001) revealed that lecturers and students were dissatisfied with the perceived insufficient amount of taught content in undergraduate curricula. It was also reported that there were limited opportunities within the curricula for integrating knowledge and skills and a lack of evidence based teaching. However, these findings were dependent on individual lecturers rather than on the curricula approach to teaching pharmacology.

Bullock and Manias (2002) reported dissatisfaction with respect to the pharmacology knowledge base of nursing students and suggested that more content and more time were needed. Similar findings by Morrison-Griffiths et al (2002) indicated that while curriculum content of pharmacology teaching appeared to be comprehensive, it remained unclear whether or not topics were addressed in sufficient depth and this was due to the nature of integrated curricula approaches. It was argued that the biological sciences have as much relevance as
behavioural sciences in pharmacology education and that nurses needed a more comprehensive knowledge of pharmacology for safe practice. King (2004) suggested that a greater emphasis on behavioural sciences rather than the biological sciences may have contributed to the unpreparedness of nurses for their medication management roles.

Manias and Bullock (2002a) found that potential conflicts existed between academic staff relating to the balance of pharmacology and nursing content in curricula, the result of which often leads to overburdened curricula. Latter et al (2000) reported that nursing curricula were crowded and that students felt overwhelmed with the amount of pharmacology they had to learn. Lecturers from scientific backgrounds were of the view that content tended to favour more sociological and nursing orientated subjects to the detriment of science based subjects such as pharmacology. On the other hand, lecturers with nursing backgrounds affirmed the value of incorporating pharmacology content with nursing subjects as it helped students to apply knowledge to clinical practice (Bullock and Manias 2002). Latter et al (2001) stated that this old debate can only move forward if outcomes or competencies become the drivers for curriculum planning rather than the preferences and traditions of nurse educators.

It is noteworthy that the studies above are dated more than ten years ago and it is plausible that pharmacology content in curricula has evolved with current times. However, more recent studies demonstrate that nursing students remain unprepared for a medication management role and this is inherently linked with undergraduate nursing education which continues to vary greatly with regard to pharmacological content and to the time dedicated to this topic (Dilles et al. 2011,
Meechan et al. (2011). Sulosaari et al. (2013) indicated that the theoretical basis of medication management remained underemphasised in nursing curricula. Therefore, the old debate of balancing biological sciences and behavioural sciences in relation to the pharmacology content of nursing education is still current. Yet, increasing the breadth and depth of pharmacology in nursing curricula does not seem like a plausible option (Latter et al. 2000). Therefore, innovative ways of enhancing learning in this area need to be explored (Manias, 2009, Gigi Lim and Honey 2006, Ives et al. 1996).

### 2.6.3 Pharmacology teacher

Latter et al (2000, 2001) reported divergent views as to who should teach pharmacology. Some lecturers considered that teaching needed to be undertaken by those with a nursing background in order for pharmacology to be applicable to nursing. Other lectures considered that biological scientists and pharmacologists were best placed to teach pharmacology. Morrison-Griffiths et al (2002) reported that nurse lecturers considered themselves the preferred teachers. Manias and Bullock (2002a) found that interdepartmental politics and finance may be responsible for the failure of many nursing departments to utilise the expertise of colleagues from the medical or biological sciences departments.

To summarise, it is evident in the literature that fundamental flaws in the delivery, structure and content of pharmacology education exist, from the perspectives of those responsible for course delivery and from the perspective of students and registered nurses. However, despite differences of opinion, there is consensus that regardless of curriculum design or teacher, that the most important aspect of teaching and learning pharmacology is that it would allow opportunities for the
integration of knowledge and skills that are necessary to ensure competent nurses develop, who are capable of sound pharmacological decision making skills (Sulosaari et al. 2013, Dilles et al. 2011, Meechan et al. 2011).

In Ireland, there are 13 higher education institutions with allied health service partners providing nurse registration education programmes (Fleming et al. 2014). In keeping with international trends (Sulosaari et al. 2013, Dilles et al. 2011) and European Union Directives (Lahtinen et al. 2014), two-thirds of theoretical content of Irish nurse registration education programmes is devoted to nursing studies, one-sixth to biological sciences and one-sixth to social sciences (An Bord Altranais 2005). However, how this translates with regard to pharmacology education is unclear. There are no national or international guidelines on the amount or level of pharmacology content required within nurse registration education curricula (Fleming et al. 2014). In 2012, the Irish Department of Health recommended that an evaluation of different approaches for the delivery of nursing and midwifery curricula should be conducted (Department of Health 2012). It is hoped that research findings within this thesis will add to the body of knowledge in the area of nursing education, particularly from an Irish perspective.

Moving away from the role of the higher education institutions, the discussion now moves to factors in the clinical learning environment which influence nursing students’ preparation in medication management.

2.7 Clinical learning environment

Nursing is a practice based profession and practice in the clinical learning environment is an essential component of undergraduate nursing education (Josen

In Ireland, nurse registration education programmes involve clinical instruction in the clinical learning environment. The time spent by students in the clinical learning environment is referred to as clinical placement. Clinical placements are supernumerary with the exception of a clinical internship in year four. Supernumerary status means that the nursing students are surplus to the rostered complement of registered nurses. However, during the clinical internship nursing students are part of the workforce and are therefore rostered on the duty roster of the allocated clinical setting. Learning on clinical placement requires integration of nursing students into clinical activities (Henderson et al. 2012) allowing students the opportunity to develop their skills and knowledge in order to become competent practitioners (Killam and Heerschap 2013).

There is available literature regarding the role of the clinical learning environment in preparing nursing students for practice. However, there is a dearth of literature specifically relating to the role of the clinical learning environment in preparing students in medication management (Sulosaari et al. 2012, Grandell-Niemi et al. 2005). The following sections explore relevant research in this area. Emerging subthemes include supervision, availability of learning opportunities and collaboration between higher education institutions and clinical learning environments.
2.7.1 Supervision

Nursing students consider human relations and support a top priority in the clinical learning environment (Papathanasiou et al. 2014, Yonge et al. 2005). Budgen and Gamroth (2008) identified ten different practice education models with regard to supervision and these vary greatly internationally.

The model of supervision used in Ireland is the preceptorship model (An Bord Altranais 2005). In the clinical learning environment, students are engaged in a preceptorship programme. Preceptorship is a one-to-one educational relationship between an experienced nurse and a nursing student. The preceptor is the clinical supervisor who provides direct clinical supervision of the undergraduate nursing student. It is the preceptor who directly interacts with the student during clinical learning opportunities (O'Brien et al. 2014). While there is literature addressing preceptorship, there is a dearth specifically relating to preceptorship in relation to medication management. Those identified are discussed below.

Reid-Searl et al. (2008) conducted a study to explore undergraduate nursing student experiences of administering medications in the clinical learning environment. This study used a grounded theory approach to gather data using semi-structured interviews with final year undergraduate nursing students (n=28). Findings indicated that in the clinical learning environment, undergraduate nursing students were involved in medication errors and ‘near misses’ and this was attributed to inadequate supervision of students. This finding concurs with earlier studies (Morrison-Griffiths et al. 2002, Latter et al. 2000). The importance of high quality supervision to ensure the delivery of safe and effective healthcare was highlighted. The quality of supervision students received in this area was
related to the attitudes of supervisors, the expectations they had of final-year students, and the educational background of the supervisor (Reid-Searl et al. 2010). Further work by Reid-Searl et al. (2013) investigating nursing students (n=45) experiences of supervision concurs with previous findings, highlighting that in order to protect patient safety, nursing students need quality supervision in relation to medication management.

2.7.2 Learning opportunities

It is accepted that nurses learn through experience in clinical practice (Ndosi and Newell 2010). Nursing students’ placement in the clinical learning environment is based on the need to integrate theory and practice and to facilitate the progressive development of clinical skills, knowledge and competence (An Bord Altranais 2005). To this end, quality learning opportunities in the clinical learning environment are fundamental (Ndosi and Newell, 2008). The need for quality learning opportunities specific to medication management has been highlighted by several authors (Sulosaari et al. 2012, Ndosi and Newell 2010, King 2004, Latter et al. 2001). Manias and Bullock (2002a) found that learning medication management did not occur in a systematic way in the clinical learning environment and recommended collaborative, structured educational initiatives to address this. This concurs with later findings by Ndosi and Newell (2010) who found that meaningful learning opportunities related to medication management did not occur without structured learning supports.

Reid-Searl et al (2008) found that quality learning experiences for students were dependent on high quality supervision. If supervision was inadequate, learning was not facilitated. This aligns with current research in that meaningful clinical
learning opportunities need to be protected and encouraged in order to support student learning (Kristofferzon et al. 2013). The literature suggests that clear learning objectives, systematic structured supports and high quality supervision need to be in place if students are to avail of meaningful learning opportunities in medication management (Ndosi and Newell 2010, Honey and Gigi Lim 2008, Morrison-Griffiths et al. 2002, Latter et al. 2001). There is limited literature available regarding learning opportunities in medication management within the clinical learning environment.

Collaboration between the higher education institutions and their healthcare partners is also highlighted in the literature as a factor in nursing students’ development. This will now be addressed.

2.7.3 Collaboration

Collaboration between higher education institutions and health service partners is fundamental to programme development, delivery and success and underpins programme delivery in Ireland (An Bord Altranais 2005). However, the literature reports that collaboration may be hampered by poor communication in some cases. This can result in a further widening in the theory practice gap for students as they do not know what is expected of them (Reid-Searl et al. 2009, Manias and Bullock 2002a).

As part of a qualitative study exploring undergraduate nursing students’ (n=28) experiences of administering medications in the clinical learning environment Reid-Searl et al. (2009) reported that divergent requirements and expectations between the university and the clinical learning environment created internal
conflict and stress for students. Nursing students were torn between meeting the expectations of the university and meeting the expectations of the clinical learning environment, particularly meeting the expectations of their preceptor. This often resulted in nursing students participating in risky behaviour which compromised patient safety. This concurs with earlier findings by Honey and Gigi Lim (2008) who reported that the majority of barriers to learning were linked to the clinical context, particularly to a lack of communication between educational and clinical learning environments.

It is evident that innovative approaches to the teaching and learning of medication management are necessary, particularly in the clinical learning environment. It is suggested that the depth and dynamic nature of pharmacology needs self-directed and continuous lifelong learning (Grandell-Niemi et al. 2005, Latter et al. 2001, Latter et al. 2000, Ives et al. 1996). The Nursing and Midwifery Board of Ireland state that nurses are expected to develop and maintain their competence with regards to all aspects of medication management and ensure their knowledge, skills and clinical practice are up to date (An Bord Altranais 2007). Manias and Bullock (2002b) found that self-directed learning was a favoured way in which nurses strived to improve their pharmacology knowledge. However, Banning (2003) cautioned that self-directed strategies for nursing students should be avoided as they needed considerable amounts of instruction, guidance and support to comprehend knowledge of applied pharmacology. In their Finnish survey of registered and graduating nurses, Grandell-Niemi et al. (2005) reported that despite the majority of participants reporting pharmacology as hard, they still found it interesting and were motivated to study pharmacology as it was perceived as relevant to their clinical practice. Findings from a cross-sectional survey of
nurses (n=42) by Ndosi and Newell (2010) concur with Grandell-Niemi et al. (2005) in that the majority of participants received the greatest part of their pharmacology knowledge in the clinical learning environment. Sources of medicine information that informed nurses’ practice were the British National Formulary (BNF), consultation with pharmacists, nursing colleagues and doctors as well as patient information leaflets (Ndosi and Newell 2010). Similarly, Sulosaari et al. (2012) and King (2004) concluded that most nurses learn pharmacology at the workplace through self-directed learning and practical experience rather than formal training. However, for this learning to occur, workplace employers need to support nurses in their medication management role (Sulosaari et al. 2012, Hemingway et al. 2011, Ndosi and Newell 2010).

Recommended supportive measures for learning pharmacology / medication management in the clinical learning environment include clinically based pharmacological knowledge assessments, pharmacological updates and an information databases (King 2004). A cross sectional exploratory study by Aggar and Dawson (2014) surveyed nursing students (n=88) from two educational institutions. A response rate of 68% was achieved and results suggested that low fidelity simulated teaching environments may improve nursing students’ perceived preparedness for oral medication administration. However, it was cautioned that such simulated environments should be in addition to, and not instead of the real life clinical learning environment (Aggar and Dawson 2014). Banning (2003) recommended mentoring, feedback and student focused methods of appraisal. Similarly, Hemingway (2011) and Fleming et al. (2014) advocated the use of practice based education and assessment frameworks in practice. However Fleming et al (2014) questioned who should teach practice based
medication management as experienced nurses may be reluctant to take on a teaching role due to their own lack of adequate pharmacological knowledge.

Multidisciplinary approaches to enhance medication management teaching and learning in the clinical learning environment are also advocated in the literature. Manias and Aitken (2004) highlighted the importance of a multidisciplinary approach to learning, advocating the idea that doctors, pharmacists and experienced clinical nurses could provide educational medication management sessions based on clinical cases. Cleary-Holdforth and Leufer (2013) suggested that shared learning and collaborative approaches to multidisciplinary learning in medication management are the way forward. They argued that medication management is a multidisciplinary process and multidisciplinary approaches to learning may reduce time and financial outlay for all concerned. Similarly, Adhikari et al. (2014) claim that the nurses’ role in medication management has evolved, beyond administration, to a multi-skilled professional role and accordingly more collaboration, more involvement and more education from a multidisciplinary perspective is needed.

2.8 Chapter summary

This chapter presented the literature review. A narrative review of literature related to nurses’ educational preparation in medication management was provided. A description of medication management, pharmacology and the nurses’ role in this area was outlined. A review of research examining the self-rated and actual preparedness of nurses for a medication management role was provided. Conclusions from the literature review indicate that nursing students and indeed experienced registered nurses are unprepared for this role. Inherent
links between the undergraduate educational preparation of nursing students and the aptitudes of registered nurses were evident. Nurse registration education programmes encompass learning in higher education institutions and learning in clinical learning environments and are influenced by the contexts of both (Budgen and Gamroth 2008). Therefore, literature regarding the role of both in the preparation of nurses was reviewed.

It was evident that the delivery, organisation and structure of pharmacology in nursing curricula vary internationally. Common approaches include dedicated modules in pharmacology or an integrated approach where pharmacology content is interwoven with other modules. Discussions concerning what constitutes an ideal programme for nursing students are contentious.

Inadequate supervision, a lack of meaningful learning opportunities and a breakdown in communication between higher education institutions and their healthcare partners were highlighted as factors which affect student learning in the clinical learning environment. It was evident that innovative ways are needed to address this problem. Recommendations included self-directed learning and shared learning with multidisciplinary, collaborative approaches to teaching and learning.

From an Irish perspective, there is very little published research regarding nursing students’ educational preparation in medication management. This research study will address this dearth by exploring nursing students’ perceptions of their educational preparation in this area. An interpretative phenomenological approach to the study will give students an opportunity to voice their perceptions and it is
hoped that findings will contribute to a greater understanding and add to the body of knowledge in this area.
Chapter 3: Research methodology
Chapter 3: Research methodology

3.0 Introduction

This chapter presents the research design. The methodological approach to a study must be capable of answering the question it seeks to answer (Newell and Burnard, 2011). Rationales for the chosen research methodology are discussed in this chapter, in an attempt to create logical links between the research question and the methodology (Polit and Beck 2013).

Conclusions from the literature review indicated that nursing students and registered nurses are unprepared for their role in medication management. Inherent links between the undergraduate educational preparation of nursing students and the aptitudes of registered nurses were evident. From an Irish perspective, there is limited published research regarding nursing students’ preparation in medication management. Therefore, this research study aimed to addresses this dearth of knowledge.

In this chapter, the aims and objectives of the study are outlined. Justification for choosing the research methodology is presented. Ethical considerations are explored. Clear details regarding sampling and access to the sample are provided. Data collection methods, piloting of the study, data analysis and the rigor of the study are discussed. The strengths and weaknesses associated with aspects of the methodology are addressed as they arise.
3.1 Research aim

The aim of this research study is to explore fourth year nursing students’ perceptions of their preparation in medication management. To meet this aim, research objectives were identified as follows.

3.2 Research objectives

- To conduct a literature review of national and international literature regarding medication management.
- To explore students’ perceptions of their educational preparation in medication management during their time in the higher education institution.
- To explore students’ perceptions of their educational preparation in medication management during their time in the clinical learning environment.
- To highlight students’ perspectives of factors that facilitated or hindered their learning in medication management.

3.3 Research design

The research design is the blueprint for a study. It represents the exact research approach best suited to answering the research question. Selection of the research design is influenced by the purpose of the study, taking cognisance of the research questions, aims and objectives (Cormack 2000). The research design creates a logical link between the research question and methodology and allows the reader to gauge the validity of the research findings (Polit and Beck 2013). In essence, a
research methodology must be fit for purpose. It must be capable of answering the research question (Newell and Burnard, 2011).

Quantitative and qualitative methods are two fundamental approaches to research design. Both approaches are major theoretical perspectives in the attainment of knowledge (Polit and Beck 2013). Quantitative studies are deductive, meaning they gather data and develop predictions from data. Qualitative studies are inductive, meaning that they gather data and develop theories about the data. In simpler terms, quantitative research is a top-down approach, the researcher starts with a general stand point and aims to confirm or disconfirm that general view. This is also known as theory testing. In contrast, qualitative research is a bottom-up approach. The researcher starts with a set of specific instances and derives a general conclusion from them. This is also known as theory building (Newell and Burnard, 2011).

Both qualitative and quantitative approaches are utilised in nursing research, neither is superior to the other but rather one approach is often deemed more suitable to the nature of the research (Newell and Burnard 2011). A qualitative/quantitative debate exists and there are many arguments for and against the use of both designs (Grove et al. 2014)

### 3.3.1 Quantitative and qualitative research

A quantitative approach is often used in nursing research and has a long tradition dating back to the 19th century with the iconic Florence Nightingale often referred to as a statistician (Parahoo 2014). Quantitative research is a formal, objective, systematic process of obtaining information, using numerical data and statistical
analysis. It is thought to be a hard science that uses numerical data to authenticate facts and quantify or measure findings and phenomena (Grove et al. 2014, Cormack 2000). It emerged from a branch of philosophy called logical positivism and is usually concise and reductionist in that it assumes it is possible to reduce complex phenomena to simple laws (Fossay et al. 2002). Generally quantitative findings are presented using graphs, mathematical models and statistical tables (Parahoo 2014). Quantitative research lends itself to the idea that the world can be understood and explained in terms of universal laws and objective truths, which apply irrespective of place and time. This view can also be interpreted as a major criticism of quantitative research - assuming that an objective reality of truth exists, independent of those undertaking the inquiry (Grove et al. 2014). Hence, one of the most important differences between quantitative and qualitative research lies in the relationship between the researcher and the participants (Grove et al. 2014). While quantitative approaches are considered valuable to healthcare research for providing sound and reliable knowledge bases to guide nursing practice, they are criticised for being inconsistent with holistic practice in the denial of unobservable values including moral and ethical relationships (Polit and Beck 2013). In light of this, a quantitative design was deemed unsuitable for this study. A quantitative approach did not create a logical link between the research questions and answers. This study did not aim to authenticate facts, quantify or measure findings and phenomena, data collection was not formal or objective and findings were not suited to numerical or statistical representation. This study was inductive in nature and multiple realities of participants existed. A qualitative approach was deemed more suitable and was the chosen methodological approach.
for this research study. An explanation and justification for this decision is presented below.

Qualitative research encompasses a variety of focuses, involving an interpretative, naturalistic approach to its subject matter, and combines the scientific and artistic nature of nursing to enhance understanding of the human experience (Newell and Burnard, 2011). It enables the researcher to make sense of reality, to describe and offer explanations of the social world to develop explanatory models and theories (Morse and Field, 2002). It is an umbrella term for a number of approaches, seeking to understand by means of exploration, human experience, perceptions, motivations, intentions and behaviours (Parahoo 2014). While quantitative research often explains why something has occurred, a qualitative approach seeks to understand the interpretations and motivations of the person involved (Creswell 2013). In direct contrast to quantitative approaches, qualitative research is based upon the belief that no one singular truth or answer to a particular matter exists (Grove et al. 2014). Reality is subjective and multiple realities exist (Creswell 2013). Therefore, qualitative research employs flexible methods of data collection which allow the researcher to explore the subjective complexity of human relationships and interactions (Polit and Beck 2013). Qualitative research is often referred to as a soft science and is criticised because the nature of the inquiry can be very subjective and as human beings are the direct instruments through which information is gathered, this can lead to insignificant finding from less experienced researchers (Polit and Beck 2013).
A qualitative approach was the chosen methodology for this study as this study aimed to explore nursing students’ perceptions of their preparation in medication management. The findings were subjective as reality exists in the mind of the person experiencing it. Multiple realities or perspectives of participants arose in this study (Jolley 2010). Human speech was the type of data collected and as Morse and Field (2002) state this type of qualitative data collection can help uncover the understandings and motives that lead to certain perceptions or behaviours. This study aimed to explore human perceptions in an attempt to provide meaningful research findings, which contribute to the future preparation of nursing students in medication management. A qualitative approach was best suited to meeting the research aims and objectives as it allowed the researcher flexibility to work in depth with a few participants, allowing them to give detailed accounts of their experiences (Newell and Burnard 2011). Specifically, a qualitative phenomenological approach was chosen, the rationale for which is discussed below.

3.3.2 Phenomenology

Unlike quantitative research designs which are underpinned by the philosophy of positivism, qualitative research designs are underpinned by a number of philosophies. Hence, there are many approaches to qualitative design, each having their own focus or way of approaching and answering research questions. Common qualitative methodologies include grounded theory, case studies, ethnomethodology, phenomenology, and constructivism (Maltby et al. 2010).
In this particular study the perceptions of nursing students regarding their preparation in medication management was only accessible by directly studying the individuals living this phenomenon. Therefore, phenomenology was the chosen qualitative methodology for this study. Phenomenology has its roots in European philosophy and is considered a philosophical discipline and a research method (Wojnar and Swanson 2007). Phenomenology highlights an understanding of the world from the viewpoint of the individual who is viewing the world. It does not attempt to come to an objective ‘truth’ about how all individuals view the world, instead it emphasises individuals’ unique views (Maltby et al. 2010). A qualitative phenomenological approach is very much in keeping with the idea that multiple realities exist and takes the view that what people perceive as real is in fact real (Jolley 2010). In this research study, students’ perceptions will vary and multiple realities will exist, all of which provide an understanding of the phenomenon. Therefore, a phenomenological methodology was chosen. However, the researcher also needed to uncover meaningful data or interpret the data in order to meet the research objectives. To this end, an interpretative phenomenological approach was used. An explanation of interpretative phenomenology follows.

### 3.3.3 Husserlian and Heideggerian approaches

At the core of phenomenology lies the attempt to describe and understand phenomena (Wojnar and Swanson 2007). Embree et al. (1997) identified seven unique perspectives of the phenomenological approach. A description of these seven approaches is outside the scope of this chapter. Instead, the two most common approaches used in nursing will be outlined. They are Husserlian
(descriptive phenomenology) and Heideggerian (Hermeneutic or Interpretive phenomenology) approaches. Husserl, a German philosopher and mathematician, is considered the founder of phenomenology and, in particular, descriptive phenomenology. Descriptive phenomenology focuses on the meaning of the lived experience, from the first person point of view. This approach (the Husserlian approach) advocates that through a process of listening, interaction and observation with the participant, a representation of reality, more refined than previous understandings, can develop. The Husserlian approach (descriptive phenomenology) advocates transcendental subjectivity – that being a process by which the researcher abandons his or her own lived reality in view of describing the phenomenon under investigation in its purist form. To achieve this transcendental subjectivity, Husserl recommended employing the use of bracketing (Wojnar and Swanson 2007). Bracketing involves the researcher examining his or her own attitudes, beliefs and prejudices and subsequently disregarding any preconceptions about the phenomenon under study (Polit and Beck 2013). Therefore, a pure description of the phenomenon emerges. The definitive test for descriptive phenomenology is that the participants themselves endorse the researcher’s description of the phenomenon as an accurate reflection of their personal experiences. The Husserlian approach advocated that human beings are free agents and are responsible for influencing their own environment (as opposed to the environment influencing individuals). The concept of ‘context’ or ‘environment’ was not central to this approach. It is this particular aspect of the ideology that leads to Husserl’s successors modifying, critiquing and further developing Husserl’s approach (Wojnar and Swanson 2007).
Heidegger, a student of Husserl, developed the Heidegger (interpretive) phenomenological approach using the premise that all humans are interpretative. For Heidegger, the ‘environment’ or ‘context’ in which a phenomenon occurred was of upmost importance. Heidegger believed that understanding of individuals does not occur in isolation of their culture, social context or of the times in which they live. This is the fundamental difference between Husserlian (descriptive phenomenology) and Heideggerian (Hermeneutic or Interpretive phenomenology) phenomenology (Brinkmann et al. 2014).

Within the qualitative paradigm, hermeneutic (interpretive) phenomenology is the chosen methodological approach for this study. While the words hermeneutic phenomenology and interpretive phenomenology are used interchangeably in the literature, for the remainder of this chapter, the term interpretive phenomenology will be used.

Interpretative phenomenology and descriptive phenomenology are useful approaches to understanding human lived experiences. It has already been established that phenomenology is an appropriate methodological approach to exploring nursing students’ perceptions of their preparation in medication management. The more specific reasons for choosing an interpretative phenomenological approach are outlined below.

The researcher aimed to understand nursing students’ perceptions in their social and cultural context. The nursing students had varied backgrounds, ages and life experiences, each bringing their own unique perspectives.
The researcher did not believe that descriptive phenomenology and bracketing will yield bias free research findings in this particular study as the researcher is also a nurse and has her own perceptions and experiences of medication management. Rather a pre-understanding of the ‘forestructures of understanding’ will be helpful. The ‘forestructures of understanding’ according to Heidegger, is the concept that all humans come to a situation with pre-understandings of phenomena based on their own social and cultural experiences. The ‘forestructures of understanding’ involve fore-having (coming to a situation with familiarity), fore-sight (the researchers’ sociocultural background) and fore-conception (anticipation of what might be found in an investigation). Interpretative phenomenologist recommend that researchers must reflect on their own past experiences, preconceptions and biases before engaging with participants so that they can more clearly access the ‘forestructures of understanding’ held by the study participants. The goal of interpretative phenomenology is that the researcher and the participants cogenerate an understanding of the phenomenon being studied, taking into account the forestructures of understanding of the researcher and the participants. In this study, the researcher had past experiences of medication management as a nursing student and registered nurse. The researcher also had awareness or ‘fore-conception’ of what might be found during this study due to her involvement in undergraduate medication management teaching. Therefore, an interpretative phenomenology approach to this study is more suitable as bracketing cannot yield bias free findings. It will be the co-creation of understanding that will make the study findings meaningful.
An objective of this study is to provide meaningful information that may influence future nursing curricula regarding medication management. An interpretative phenomenological approach, with its co-creation of understanding and acknowledgement of the subjectivity of the researcher, seems the obvious methodology choice for this study. Having discussed the rationales for choosing an interpretative phenomenological approach to this study, the next section addresses access to the study participants and ethical considerations.

3.4 Access

Any research project which involves human participants is subject to ethical approval by a research ethics committee. In general, ethics committees consist of professionals and members of the lay community with interest in such areas as law, theology and moral practices. The aim of such committees is to protect the rights and interests of the people by scrutinising research proposals before they can be put into practice (Cormack 2000). Human participants must be safeguarded by the knowledge that the research being carried out is in fact ethical. There are ethical deliberations surrounding all forms of research and this includes nursing research (Newell and Burnard 2011). As a nurse, the researcher involved in this study abides by the code of professional practice set out by the Nursing and Midwifery Board of Ireland (An Bord Altranais 2007). The researcher also abides by the University of Limerick research ethics process as this research study was part of an academic programme and the study participants were students of the Faculty of Education and Health Sciences at the University of Limerick. Therefore, this particular research study was subject to the approval of the Faculty of Education and Health Sciences Research Ethics Committee at the University of
Limerick. Ethical approval was granted in May 2013 (Appendix A). Once ethical approval was granted, a letter was sent to the Head of the Nursing and Midwifery Department requesting access to the fourth year nursing student cohort. This was granted and student names and university email addresses were provided by a gate keeper in the department.

3.5 Ethical considerations

The conversation about ethics began in ancient Greek times, it is a branch of philosophy that deals with the dynamics of right or wrong in our moral lives (Fouka and Mantzorou 2011). Ethical considerations in research can be explained as a set of moral values that are concerned with the degree to which researchers adhere to professional, legal and social obligations regarding human study participants (Polit and Beck, 2013). In response to human rights violations during the 20th century, codes of ethics were developed around the world. The first international set of ethical standards, known as the Nuremberg Code, was developed in 1949, in response to human rights violations carried out in the name of research during the Nazi atrocities of the Second World War. Guided by the Nuremberg code, the World Medical Association developed the Declaration of Helsinki in 1964 and this code of ethics was adopted around the world by those involved in health research. The Belmont Report was published in 1979 and summarised ethical principles and guidelines for research involving human subjects (National Commission for the Protection of Human Subjects of Biomedical and Behavioural Research 1979). Since these landmark ethical codes and declarations, many international ethical standards have been developed and
adopted in health research internationally (Parahoo 2014, Newell and Burnard 2011).

In Ireland, a guidance document regarding the ethical conduct of nursing and midwifery research is provided by the statutory body known as the Nursing and Midwifery Board of Ireland (An Bord Altranais 2007). In this document it clearly states that Irish nurses must take cognisance of the principles within the Nuremberg Code (1947), the Helsinki Declaration (1964), Human Rights Legislation and the Irish Data Protection Acts (1988; 2003). Furthermore, Irish nurses engaged in research must adhere to the Code of Professional Conduct for each Nurse and Midwife’ as described by the Nursing and Midwifery board of Ireland (An Bord Altranais 2014).

As stated, this particular research study was granted ethical approval by the Faculty of Education and Health Sciences Research Ethics Committee at the University of Limerick (Appendix A). A fundamental ethical requirement of all research is that it is scientifically sound and conducted by researchers who are supervised or have adequate expertise (Richards and Schwartz 2002). The researcher involved in this study was a novice and therefore was supervised by two experienced researchers as part of an academic programme.

The Belmont Report instructed on three specific, fundamental ethical principles. They are beneficence, respect for persons and justice (National Commission for the Protection of Human Subjects of Biomedical and Behavioural Research 1979). These guiding principles are the benchmark that is used when formulating and assessing the appropriateness of research studies (Polit and Beck 2013, Newell
and Burnard 2011). These principles will be explored next in relation to this particular research study.

3.5.1 Beneficence

In research, the researcher should maximise benefits to the participants and avoid, prevent or minimise harm at all times, this is known as beneficence (Newell and Burnard 2011). Findings from this research study yielded valuable information for supporting nursing students’ future learning in medication management. Participants in this study were fourth year nursing students, nearing completion of their programme. Therefore, findings would not directly impact or benefit them. However, it is important that students have a voice or a say in their educational experiences and this research study offered students that opportunity.

In keeping with the notion of beneficence, the term non-maleficence refers to the principle that research should not cause any harm to participants (Parahoo 2014). While there were no anticipated risks to participants in this study, it was acknowledged that all qualitative research has the potential to raise emotive response in people, especially when participants are drawing on past experiences. As stated by Parahoo (2014), physical injury may be obvious but psychological effects are not so transparent. In this study, the researcher ensured that participants were aware of the student support services available, for example UL student counselling services. Support was also available from academic advisors and course directors. If participants were on clinical placement in the clinical learning environment during the research, students could avail of an employee assistance programme, details of which were provided by the researcher. However, it was anticipated that this study would not place excessive physical, emotional or
psychological demands on the participants and no signs of emotional upset or discomfort were noted during the interviews.

3.5.2 Respect for persons

Respect for persons is a fundamental ethical principle in research and encompasses many complex issues like the right to self-determination, to autonomy, to informed consent, to privacy and the right to full disclosure of relevant information and above all truth (Polit and Beck 2013, Maltby et al. 2010, Parahoo 2006, Richards and Schwartz 2002). These principles are intertwined but they will be addressed hereunder.

Self-determination refers to the individuals’ right to agree to participate or not participate in a study. The individual has the right to make a knowledgeable voluntary decision in this regard. Self-determination was upheld in this study as participation was voluntary and informed consent was sought prior to data collection (Appendix D). Also, participants were reminded that even after agreeing to participate, they could still decline to answer questions and could withdraw from the study at any stage.

Autonomy is considered to be an individual’s capacity to be one's own person, to make one’s own decisions freely, based on personal reasons and motives and not because of manipulation or coercion (Polit and Beck 2013, Newell and Burnard 2011). In research, autonomy involves ensuring that participants make free, independent and informed choices about taking part in the study (Newell and Burnard 2011). In this research study, the autonomy of the research participants was upheld by ensuring that they were making informed decisions about
consenting to participate. An informed decision to consent to be part of a study involves an autonomous decision on behalf of the participant (Parahoo 2014). In this study, informed consent was safeguarded by ensuring that participants had clear, accurate and unambiguous information about the study (Appendix D). Information about the study was provided verbally and in a written format, in a manner that allowed the person time to consider their position and seek clarification if required. It was important that participants did not feel coerced into participating. The autonomy of this study was upheld by the aforementioned measures to address self-determination and by reinforcing the fact that participation was voluntary and the right to withdraw was pertinent at all stages. However, the researcher acknowledged one issue that may affect participants’ autonomy in this study - the researcher was involved in teaching on the undergraduate nursing programmes, albeit this involvement was with a small number of students. Therefore, it was important that students felt no coercion to participate in this study. The right to participate or not and the right to withdraw were reinforced at all stages of the study. The researcher was involved in the second year teaching of the programme and the students involved in this study were in their fourth year, so it was anticipated that this helped negate feelings of coercion as there was no interaction between the researcher and the students in fourth year outside of this study.

All research participants are entitled to privacy as a basic ethic principal (Newell and Burnard 2011). To ensure privacy in this study, the confidentiality and anonymity of participants were guaranteed at all times and written consent was obtained from participants prior to any data collection (Appendix D). Participants’ names were not linked to their responses in the research transcripts or the research
thesis. Participant numbers were used at all times in the presentation of findings. Masking was used in verbatim statements to hide verbal mannerisms or figures of speech which might identify a participant. All data gathered from participants was held securely by the researcher in a locked cabinet and/or on a password protected data management system. Only the researcher and the researchers’ supervisors had access to the data.

Truth and full-disclosure involves ensuring participants were fully informed about the study, were aware of what the study was about, what was expected of them and what the benefits and the risks were. Researchers must tell the truth, even if this means participants decide not to participate or to withdraw from the study (Parahoo 2014). This principle was upheld by providing participants with an invitation email (Appendix B) and a participant information sheet (Appendix C), both of which provided full disclosure of relevant study information. Participants also had an opportunity to verbally discuss the study with the researcher prior to consenting to take part and at any stage during the research process.

3.5.3 Justice

The ethical principal of justice in research refers simply to the right of people to be included in a research study and consequently benefit from that. All fourth year nursing students had an equal chance of being included in this study and were not excluded based on age, race, colour or gender (Parahoo 2014, Newell and Burnard 2011). The sampling methods used in this study took cognisance of the ethical principal of justice. A further exploration of this will be provided in the next section.
3.6 Sampling

Sampling is a process of selecting a representative group of the population under study. In other words a sample is a subset of the population (Polit and Beck 2013). According to Groves et al. (2014) the term population refers to all those who fit into the inclusion criteria of a particular study. It incorporates the entire class of cases to which the researcher wishes to generalise research findings to (Cormack 2000). The population of particular interest in this study were fourth year undergraduate BSc Nursing students at the University of Limerick. The nursing students were on one of the following programmes – BSc Nursing (General) BSc Nursing (Intellectual Disability) or BSc Nursing (Mental Health).

There are two types of sampling – probability and nonprobability sampling (Polit and Beck 2013). Probability sampling uses a form of randomisation in the selection of subjects. Therefore, there is a greater likelihood of the sample being representative of the population. In nonprobability sampling, subjects are selected without randomness. Therefore, results are less likely to be representative of the population under investigations. This is known as generalisability, meaning the extent that results can be applied to other groups (Arslanian 2000). Qualitative researchers more often than not employ nonprobability sampling techniques, as sample selection is not determined by the need to ensure generalisability but rather to investigate fully the chosen topic and provide information rich data (Higginbottom 2004).

Nonprobability sampling was the chosen method for this study. Fourth year nursing student were the population under investigation and in attempt to yield detailed and rich descriptions of their perceptions, nonprobability sampling was
necessary. The aim of this study was not to generalise but rather to describe and interpret the student’s perspectives in a manner that created meaning and achieved a sense of understanding.

There are three common methods of sampling in qualitative research, they are convenience sampling, purposive sampling and snowball sampling. Purposive sampling was the method used in this study. In purposive sampling, the researcher selects a subset of the population who may have something relevant to say in relation to the research aims (Newell and Burnard 2011). In this case, the researcher was selective in so far as the fourth year nursing students were the sample of interest, not the students of first, second or third year. The researcher anticipated that fourth year nursing students may have a more relevant perspective on their preparation in medication management due to their seniority in the programme. The following inclusion and exclusion criteria applied during the nonprobability purposeful sampling in this study:

Inclusion criteria

- Students of year four BSc Nursing (General), BSc Nursing (Intellectual Disability) or BSc Nursing (Mental Health) programmes at the University of Limerick.

Exclusion criteria

- Students of first, second and third year BSc Nursing programmes at the University of Limerick.
Illumination of data rather than representativeness is the aim of qualitative nonprobability sampling (Newell and Burnard 2011). As a result, sample sizes are often much smaller in nonprobability sampling than in probability (Higginbottom 2004). Criticism of lower sample sizes in qualitative research is well refuted in the literature with the agreement that high quality, illuminating data is the focus of qualitative work, not generalisability (Parahoo 2014, Polit and Beck 2013, Newell and Burnard 2011). Smith (2004) recommends using between five and ten participants for qualitative research. Watson et al. (2008) suggest that a larger sample size can be used in interpretative phenomenology as long as the researcher has appropriate time and resources. The sample size for this study was fourteen participants as the researcher wanted to allow for a pilot study, increase the probability of reaching data saturation and also allow for drop-outs while still maintaining a good sample size.

The target population in this study were fourth year nursing students across three programmes. Students’ university email addresses were obtained from a gate keeper in the Department of Nursing and Midwifery. This resulted in a list of eighty-six student email addresses which were based on student identification numbers rather than names. In order to recruit fourteen participants, an invitation email (Appendix B) with a participant information sheet attached (Appendix C) was sent to randomly selected groups of up to twenty students until a sample size of fourteen participants was achieved. The aim of contacting groups of twenty at a time was to promote inclusiveness. This negated the probability of more than fourteen participants volunteering and reduced the risk of having to turn away participants. Therefore, this enhanced inclusiveness and was in keeping with the ethical principal of justice.
Once a student replied and expressed an interest in the study, a face to face meeting was organised where verbal and written study information was provided again. The study was discussed and informed consent was obtained or declined in verbal and written format (Appendix D). If consent was obtained then a date for interview, at a time convenient for the participant, was organised.

In the event of no email replies, the researcher had also planned a face-to-face meeting with all students at the end of a lecture during university time. It was planned to distribute hardcopy invitation letters and participant information sheets. However, this did not come to pass as email responses to the study were high. It was interesting to note, that after the pilot study, unknown to the researcher at the time, a pilot study participant posted their experiences of participating in the study on a private, closed group social media page (Facebook) for fourth year nursing students and encouraged others to participate. The researcher believes that this influenced the high email response rate to participate. Some participants informed the researcher that they heard about the study on Facebook.

3.7 Data collection

Data collection is a series of organised activities aimed at assembling good information to answer the research questions. There are many different approaches to collecting data and the task of selecting or developing methods of gathering data is a challenging experience for the researcher. Without appropriate data collection methods, the validity of the research conclusions can be challenged without difficulty (Polit and Beck 2013). Ultimately, the nature of the research question informs the data collection approach (Doody and Noonan 2013).
Qualitative research is about words spoken, usually in one of three formats - words spoken in an interview, words written down by the researcher during or following an observation or words already published or audio-recorded. Hence, qualitative data collection occurs in several forms such as observations, interviews, from reading documents (e.g. personal accounts or diaries) or from listening to audio-visual material (Newell and Burnard 2011).

This interpretative phenomenological study aimed to explore nursing students’ perceptions of their preparation in medication management. In order to uncover the understandings and motives that led to certain perceptions or behaviours it was important that flexible data collection methods were utilised (Smith and Osborn 2003). Human speech would be the type of data collected in this study. Therefore, interviews were the chosen data collection method.

There are three broad interviewing techniques. They are structured interviews, semi-structured interviews and unstructured interviews (Doody and Noonan 2013). Structured and unstructured interviews were rejected for this study as they were not deemed suitable methods of data collection. A structured interview is often likened to a ‘verbal questionnaire’. While it has advantages of speed and consistency, the structured interview was deemed limiting in trying to meet the aims and objectives of this study as the participants can only answer in a short format and there is no room for deep exploration or deviation from the topics at hand (Parahoo 2014, Polit and Beck 2013, Maltby et al, 2010). The type of data collected from this form of interviewing is the very antithesis of the type of data needed for an interpretative phenomenological study, as deep exploration and interpretation of topics is not possible. Likewise unstructured interviews were
rejected, although an unstructured interview allows for depth and exploration of meanings, their use was deemed inappropriate in this study as they can allow participants to veer away from the direct focus of the research. This results in data that is so diverse between participants that comparison and contrasts between transcripts becomes impossible (Newell and Burnard 2006, Smith and Osborn 2003).

Semi-structured interviews were the chosen data collection method in this study. Semi-structured interviews are commonly utilised in interpretative phenomenological studies (Smith and Osborn 2003). This method allowed the researcher and the participant to engage in dialogue. It also allowed the researcher to modify questions in light of responses and to probe interesting and important areas as they arose (Smith and Osborn 2003). In the semi-structured interview, the researcher had an interview guide with predetermined questions (Appendix E). However, it is important to point out that the interview was guided by the interview guide, not restricted by it. This type of interviewing allowed the researcher flexibility in the way and order in which questions were asked. Thereby, allowing the interview to flow more freely and naturally. The main aim was to cover similar topics in each interview but not necessarily have identical interviews with each participant (Newell and Burnard 2011).

Semi-structured interviews were conducted face-to-face with participants. Face-to-face encounters enabled the researcher to get a deeper understanding of the participants experience by observing non-verbal communication such as facial expressions, blushing, gestures and silences (Kleiman 2004). To assist with data collection and analysis, the research used a reflective diary to make note of such
non-verbal communication at the end of each interview. Participants were given a choice of settings for the interview in order to provide a comfortable, informal, relaxed environment with minimal distractions. The researcher suggested a small, private interview room in the university but also offered the participants the option of picking a more suitable place of their choice. However, all participants choose the interview room in the university as it didn’t place undue time or travel constraints on them.

A limitation of the interview technique is that there is no way of knowing that the participant is telling the truth. People are known to respond in a way that creates a positive impression (Doody and Noonan 2013) Therefore, the researcher made the assumption that the participants were being truthful. The interview guide (Appendix E) was used to guide the interview but it did not dictate its natural course. The interview session was audio-recorded with the participants’ permission and the ethical considerations of beneficence, respect for persons and justice were upheld throughout the process. A reminder discussion with participants, prior to commencing the interview, about how anonymity and confidentiality would be maintained helped to build trust (Doody and Noonan 2013). Participants were also reminded that they didn’t have to answer a question if they didn’t want to and they could end the interview or withdraw from the study at any stage. Interviews duration ranged from forty to sixty minutes. As recommended by Doody and Noonan (2013), at the commencement of the interview the following information was discussed with participants:

- The nature and format of the interview was explained to the participant.
It was highlighted that there were no right or wrong answers.

Participants were reassured that they could take their time in thinking and answering questions.

Participants were encouraged to ask questions as they arose.

The approximate length of the interview was discussed.

Through taking these adequate steps to build trust and establish a rapport with the participants a comfortable environment was created. This allowed the interview to flow naturally with the generation of information rich data (Doody and Noonan 2013). A pilot study was conducted prior to data collection in the actual study.

3.8 Pilot study

Pilot studies are conducted as a preliminary to the actual study (Cormack 2000). They are conducted to refine methodology and are often seen as a small scale trial run of the study (Grove et al. 2014). Unforeseen problems may arise during the course of a study and by having previously conducted a pilot study, these problems may be minimised or eliminated. A pilot study also helps the researcher to improve or develop their interviewing skills (Polit and Beck 2013).

Prior to the initiation of this particular study, a pilot study was conducted with two participants. In turn, these participants were excluded from the actual study as repeated interviewing may have elicited different or pre-determined responses. Several issues arose from the pilot study. Participants were conscious of the audio recorder so in subsequent interviews the researcher placed it out of sight. However, participants were still aware of its existence and consented to its use.
The researcher was nervous in the pilot interviews and on reflection and listening back on interviews it was felt that the interview schedule was adhered to too strictly and this hindered deep exploration of topics. The researcher addressed this in the actual study by being more flexible, allowing participants to clarify and expand their answers and generally allowing the interviews to flow more naturally. In light of participants responses it was felt that the interview questions were unambiguous and therefore the questions remained the same for the actual study.

3.9 Data analysis

This qualitative study was inductive in nature and hence the data analysis process was also inductive. The aim of data analysis in phenomenological studies is to produce a detailed and systematic recording of themes and ideas that arise during the interview stage and to link similar themes together under a practical comprehensive category system. In doing this, the researcher aimed to preserve the uniqueness of each lived experience of the phenomena, while allowing an understanding of the topic itself (Parahoo 2014, Wojnar and Swanson 2007). In interpretative phenomenology, the aim of analysis goes further than the categorisation of recurrent themes. It aims to understand the content and complexity of those themes rather than just list and measure their frequency. This can only be achieved through the researcher having a sustained, engaged relationship with the interview transcripts and through a process of interpretation. Good data analysis balances phenomenological description with insightful interpretation (Smith and Osborn 2003).
In this study there was a phenomenological requirement to give a voice to the nursing students and an interpretative requirement to contextualise and make sense of those voices. This is what guided the researcher in moving from a descriptive to an interpretative phenomenological approach to this study. The interpretative approach was suited to meeting the research aims of giving a voice to the nursing students, while at the same time yielding valuable information for supporting future learning in this area. In phenomenological research, the participant is trying to make sense of their personal and social world and the researcher is trying to make sense of the participant trying to make sense of their personal and social world, so it is a double hermeneutic or interpretation (Smith 2004). Therefore, it is difficult for novice researchers to understand and identify a point where description ends and interpretation begins (Larkin et al. 2006). The researcher involved in this study is a novice researcher and therefore was guided by a published method of thematic content analysis (Burnard 2011). The researcher also chose to transcribe all interviews rather than employ transcription services in an attempt to develop a deep understanding of the data. There are many analysis methods used for interpretative phenomenology such as Van Kaam (1959), Giorgi et al (1975), Colaizzi (1978), Van Manen (1989) and Watson (2008). A description of all these methods was outside the scope of this thesis. Burnard’s (2011) framework for thematic content analysis was utilised in this study. This six stage method has been widely used in published qualitative studies (Newell and Burnard 2011). It allowed for a large body of information to be condensed into thick descriptive findings. A description of the steps involved is outlined below.
**Stage one:** reflective diary entries were made after each interview. Each interview was unique and left an impression on the researcher. These impressions were noted in the diary and later acted as ‘memory joggers’ for the researcher. This helped the researcher to enhance the dependability of the data. The interviews were transcribed verbatim by the researcher. As the researcher was novice, it was felt that immersion through transcription would help with data analysis and further enhance the credibility and dependability of the study. Each participant was given a number and each response was numbered for example P1 = Participant 1 and P1-20 = Participant 1, response number 20. This made it easy to trace data back to the original transcripts, particularly in the later stages, when data was reduced and collapsed into subthemes and themes.

**Stage two:** the transcripts were read and re-read until the researcher felt immersed in the data. Initial impressions about the transcripts were noted in the margins. Comparing reflective diary entries and initial transcript impressions was useful at this stage. It added a deeper understanding and authenticity to the analysis.

**Stage three:** the transcripts were read and re-read again. Words or phrases that summarised what was being said by participants were written in the margins of transcripts. This is known as open coding. Reduction of text was carefully applied and as a result, one hundred and thirty three category codes were recorded across the twelve participant interviews (Appendix F).

**Stage four:** the category codes were analysed and similar category codes were collapsed into higher order category codes. This resulted in nine higher order category codes (Appendix F). At this stage it was decided to start using the term
‘subtheme’ instead of ‘higher order category code’ and the word ‘theme’ instead of ‘final category code’. The phrases ‘themes and subthemes’ are more widely used in published research and these phrases made more sense to the researcher. In their book, Newell and Burnard (2011) used the phrases ‘subthemes’ and ‘themes’ interchangeably with the phrases ‘higher order category codes’ and ‘final category codes’ respectively, thereby justifying the adoption of this approach by the researcher.

**Stage five:** returning to the original transcripts armed with the final list of subthemes is recommended at this stage. The researcher worked through the original transcripts matching sections of text to the corresponding subtheme, until there was no text left. Burnard (2011) stated that this stage can be achieved using a data management program or it can be done by hand using highlighter pens and a scissors to cut out and match up corresponding text. In this study, the researcher felt there would be greater learning as a novice researcher to complete this section of analysis without a data management programme. Therefore, the text of interview transcripts were colour coded until all text was accounted for. Each colour represented a subtheme. The end result meant that all quotations related to specific subthemes were recorded in a manageable, easily accessible way.

**Stage six:** four themes emerged from the organised data. They were *developing an understanding, embedding knowledge in practice, engaging in practice* and *accepting professional responsibility*. These themes captured participants’ perceptions of their preparation in medication management and provided the basis for the subsequent findings and discussion chapters. This qualitative research aimed to present truthful illustrations and interpretations of participants’
perceptions. To ensure the accuracy and truth of the research, rigor must be established. In the following section the rigor of this study is discussed.

3.10 Rigor

The term rigor relates to striving for excellence in research (Grove et al. 2014). In order to achieve a rigorous study the researcher must demonstrate to the reader that all measures were taken to ensure the reliability of the research and the validity of the findings. No research is entirely flawless and no research carried out in a natural setting can be perfect. If a researcher does not acknowledge limitations, problems and ambiguity then the study risks losing credibility and integrity (Cormack 2000). Guba and Lincoln (1994) describe authenticity criteria for establishing rigor in qualitative research. The key concepts are credibility, dependability, confirmability and transferability. These concepts are discussed in relation to this research study.

3.10.1 Credibility

The aim of qualitative research is to present findings which are plausible. This is often referred to as the credibility of a piece of work (Sliverman 2000). Research operates on a basis of trust (Cormack 2000). To demonstrate rigor, the researcher must establish trustworthiness. Trustworthiness means that the research is carried out fairly and that the findings are a true representation of the perceptions and experiences of the participants under study (Byrne 2001). Establishing credibility of a research method is achieved by numerous strategies built into the data collection and analysis phase (Byrne 2001). The strategies that were used to enhance credibility in this study are outlined below.
The researcher had prolonged engagement with participants during data collection, during transcription of interviews and during the data analysis stage of the research. Interpretative phenomenological research is known to require considerable investment of time on behalf of the researcher (Smith and Osborn 2003). The researchers’ prolonged engagement and immersion in data enhanced the credibility of this study.

A fundamental ethical requirement of all research is that it is scientifically sound and conducted by researchers who are supervised or have adequate expertise (Richards and Schwartz 2002). As the researcher in this study is a novice undertaking an academic programme, peer checks were sought from the expert research supervisors. Audio recordings and verbatim interview transcripts were peer checked by the supervisors for accuracy.

A reflective journal was kept during the research process to add authenticity and enhance data analysis. Entries were made after each interview, taking note of how the interview went and noting particular topics which were emphasised by participants. Initial impressions were recorded and these acted as memory joggers during data analysis.

Reflexivity is the hallmark of excellent qualitative research. Reflexivity can be described as the willingness of the researcher to acknowledge and take account of the ways they influence the research findings. The researcher then subjects their own influences to the same critical analysis and scrutiny as the research itself (Sandelowski and Barroso 2002). In this study, the researcher had prior experiences in the area of medication management as a nursing student and as a
registered nurse. The impetus for this study arose from the researchers’ involvement with nursing students in the area of medication management education. Anecdotally, students expressed an appetite for more input on pharmacology and medication management. This research aimed to give a voice to students regarding their preparation in this area. However, the researcher acknowledged that her perceptions and experience could influence the findings. Therefore, the researcher reflected on her own past experiences, preconceptions and biases before engaging with participants so that the ‘forestructures of understanding’ held by the study participants would be more clearly accessed.

3.10.2 Dependability

Dependability refers to the stability, consistency and accuracy of the data over time. A study is considered dependable if another researcher can follow the original researchers’ process and decision trails and arrive at the same conclusions. In order to do this, the original researcher must leave behind a logical, traceable and clearly documented process of research (Polit and Beck 2014). Keeping reflective diaries, audio recordings of interviews, transcribed interview data and audit trails are all ways in which dependability can be enhanced. In this research study, all data records were maintained in a secure and confidential manner for an allocated period of time as per data protection laws. Also an audit trail was kept, detailing coding information and decision making rationales.
3.10.3 Confirmability

Confirmability refers to the objectivity of the data. It involves demonstrating that the interpreted findings are actually from the collected data and that the researcher did not allow personal beliefs or inclinations to sway the findings. Interpretation of the data must portray the same meaning for all (Parahoo 2014). The researcher used an audit trail to enhance confirmability. This will allow external examiners or other readers to access the decisions made and the steps taken in this study (Byrne 2001).

3.10.4 Transferability

Transferability refers to the extent to which findings from the data can be transferred from one setting to another. This is also known as the generalisability of findings (Polit and Beck 2013). A purposeful sample of nursing students, from three different nursing programmes provided rich data and thick descriptions which addressed the research aims and objectives. This makes transferability of the research possible.

3.11 Chapter summary

This chapter outlined the research methodology for this qualitative research study. Research aims and objectives were outlined. An overview of quantitative and qualitative approaches was provided and the justification for choosing an interpretative phenomenological approach was offered. Access to the research site and population was discussed. Ethical considerations to safeguard the rights and welfare of the study participants were explored. Details regarding the data collection and data analysis were presented. Finally, a brief description of rigor in
research was given, including an overview of how this was achieved in this particular study. The next chapter presents the findings from this study.
Chapter 4: Presentation of findings
Chapter 4: Presentation of findings

4.0 Introduction

This study explored the perceptions of fourth year undergraduate nursing students regarding their educational preparation in medication management. Participants of this study were students on the undergraduate BSc Nursing (General), BSc Nursing (Intellectual Disability) and BSc Nursing (Mental Health) programmes at the University of Limerick. In Ireland, nurse registration education programmes are four year degree programmes which encompass theoretical and clinical instruction. Theoretical instruction occurs in approved higher education institutions and clinical instruction occurs in clinical learning environments within the health service providers in the Health Service Executive. The time spent in the clinical learning environment is called clinical placement and occurs in the first three years of the programme where students are supernumerary (surplus to the complement of registered nurses). In the fourth year, students commence a clinical internship where they are part of the workforce and are therefore rostered on the duty roster of the clinical placement. Participants in this study were entering the fourth year of their programme and about to embark on a clinical internship and so findings are interpreted within that context.

Fourteen semi-structured interviews were conducted to obtain in-depth qualitative data from the participants. The interviews were transcribed and analysed utilising Burnard’s (2011) framework for thematic content analysis. The findings reflect the participants’ perceptions of their educational preparation during their time in
the university, supernumerary clinical placements and their expectations for the future.

This chapter presents the findings, which include the themes and subthemes that emerged from the data. Participants’ statements are included to support the themes. Some of the themes have overlapping elements and some of the statements may highlight more than one theme. Polit and Beck (2013) identifies that narrative material is generally not linear, and paragraphs from transcribed interviews often contain elements relating to several themes. However, in presenting the findings, the researcher has selected quotes that illuminate the concept most appropriately. The themes and subthemes identified in the findings are presented in Table 4.1.

4.1 Findings

The four themes formulated through data analysis were; developing an understanding, embedding knowledge in practice, engaging in practice and accepting professional responsibility. As described in detail in chapter three, these themes were formulated by grouping the key statements in each interview into category codes and then collapsing similar category codes into subthemes and themes (Burnard 2011). Therefore, the purpose of creating themes was to provide a means to describe the phenomena, increase understanding and generate knowledge (Burnard 2011, Elo and Kyngas 2008).
Table 4.1 Themes and subthemes

<table>
<thead>
<tr>
<th>Themes</th>
<th>Subthemes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing an understanding</td>
<td>The meaning of medication management.</td>
</tr>
<tr>
<td></td>
<td>Wider issues in medication management.</td>
</tr>
<tr>
<td>Embedding knowledge in practice</td>
<td>The pharmacology module.</td>
</tr>
<tr>
<td></td>
<td>Clinical placement.</td>
</tr>
<tr>
<td></td>
<td>Technology enhanced information source.</td>
</tr>
<tr>
<td>Engaging in practice</td>
<td>Preceptorship and support.</td>
</tr>
<tr>
<td></td>
<td>Clinical learning environment.</td>
</tr>
<tr>
<td>Accepting professional responsibility</td>
<td>Future medication management role.</td>
</tr>
<tr>
<td></td>
<td>Responsibility for own learning.</td>
</tr>
</tbody>
</table>

4.2 Developing an understanding

The first theme encapsulated the participants’ understandings of what medication management means. This study was about medication management, so it was important to explore what this term meant to the study participants. However when asked, participants’ initial responses were limited and focused on medication administration. Participants expressed concerns about having limited experience in this and reported feeling overwhelmed by all the different medications and by the inconsistent use of pharmaceutical language by staff. However, when further elaboration was sought and the researcher probed participants’ responses in an open manner, it was evident that participants were considering wider issues and developing their understanding of the general
principles and responsibilities of medication management. These areas are addressed further under the subthemes the meaning of medication management and wider issues in medication management.

4.2.1 The meaning of medication management

The first subtheme identified was the meaning of medication management. Within this subtheme participants discussed their understandings of the term medication management.

Across all interviews, participants referred to many aspects of medication management and appeared to have awareness of medication management general principles and responsibilities as described by the Nursing and Midwifery Board of Ireland (An Bord Altranais 2007). For example the five rights of medication administration (right patient, drug, date, time and route), monitoring, documentation, patient education and safety were identified by participants. However, when asked at an individual level, participants focused on medication administration of oral medications, to the exclusion of other routes of medication administration. This focus was driven by the fact that medication administration of oral medications is routine practice in nursing and something that the participants had encountered and been involved in. This involved administration of prescribed medicines to patients at set times of the day/night. While participants clearly expressed their involvement in the administration of oral medications during their educational preparation, other routes of medication administration were only mentioned by two participants (i.e. intravenous and intramuscular). Given that medication administration is a major element within medication management, participants did express their concerns regarding the
opportunity to engage in these activities. This limited exposure created an underlying insecurity, in that participants felt they had not gained sufficient practice across the wider areas of medication management and as a result felt unprepared as they entered their fourth year and clinical internship. Noteworthy within this study was that even when participants had the opportunity to participate in medication administration, they reported feeling overwhelmed by all the medications. This sense of being overwhelmed arose due to the quantity of different medications and due to the inconsistent use of pharmaceutical language by staff using generic and trade medication names interchangeably.

“I mean when I look into that drug trolley it’s like….for all the worlds, it’s like looking into a bunch of thistles…..I don’t know what’s what” P10.

“The terminology as well, some still refer to them [drugs] as the brand name and you’re trying to learn generic names” P2.

4.2.2 Wider issues in medication management

The second subtheme addressed wider issues in medication management. In addition to participants’ initial understanding of medication management, it was evident that participants appeared to be developing an understanding to include the wider issues of medication management. Within the discussion participants identified wider issues such as the changing role of the nurse, the role of the multidisciplinary team, patient education and patient safety. Within the context of the changing role of the nurse, participants referred to increased nursing responsibilities with the increasing number and the complexity of medications used in practice. However, it is interesting to note that nurse prescribing was not raised by participants considering that, education programmes for nurse/midwife
prescribing in Ireland commenced in 2007 and currently registered nurse prescribers are active within the health services. However, participants perceived that a multidisciplinary approach to medication management was evident and they discussed pharmacists, doctors, dieticians and nurses working together to meet individual patient needs.

Awareness of patient education was evident across all interviews and participants highlighted the importance of taking time to sit with patients and discuss medication management issues. Patient safety and an awareness of the links between medication safety and patient safety were also highlighted. This was evident when participants spoke of their fear of making a medication error which could endanger patients.

“You’re really nervous you know because these are big mistakes, these are important things...people can die...you are now responsible and legally responsible for this so it’s very scary” P2

Overall in this theme, it was evident that participants were considering wider issues and developing their understanding of the general principles and responsibilities of medication management.

4.3 Embedding knowledge in practice

This second theme captured how participants developed their knowledge and related it to their practice. An essential element in developing knowledge was the structured learning regarding medication management that occurred in the university setting, particularly the pharmacology module. However, there were divergent views as to whether or not the module was helpful. In addition, the importance of clinical placement in the clinical learning environment was
highlighted by participants and it was considered a fundamental aspect of their education. Within the clinical learning environment, participants spoke about the use of information sources as a means of assisting them in their quest to embed knowledge in practice. A move towards technology enhanced information sources as opposed to the traditional ‘hardcopy’ sources was evident. These areas are further addressed under the subthemes of: the pharmacology module, clinical placement and technology enhanced information sources.

4.3.1 The pharmacology module

The first subtheme identified is the pharmacology module. Within this subtheme participants spoke of the structured learning that occurred in the university related to medication management. Issues that arose included participants’ views regarding the delivery, content, assessment strategies and timing of the pharmacology module. Perceptions regarding who teaches pharmacology were also expressed. Participants referred to learning styles and indicated that their preferred learning style may have influenced their perceptions of the pharmacology module.

For participants, structured learning in the university regarding medication management mainly occurred during the pharmacology module in the second year of their undergraduate programme. The pharmacology module included weekly lectures and clinical skills laboratory teaching sessions. Lectures were facilitated by lecturers with a pharmacology background and the clinical skills laboratories were facilitated by lecturers with a nursing background. However, in addition to the pharmacology module it was evident from the discussions that medication
management education was an integral part of other modules throughout the four year undergraduate curriculum.

There were mixed feelings regarding the pharmacology module and a split in participants’ perceptions regarding the helpfulness of the module. The contrasting views were evident as half of all participants expressed negative views about the helpfulness of the module, while the other half expressed positive views about the module. These divergent views were interlinked with participants’ views regarding the balance between biological sciences and nursing science in the pharmacology module. Some expressed the view that a scientific approach to medication management enhanced their education in this area, while others expressed the view that there wasn’t enough nursing science and that this limited their opportunities to link theory and practice.

“The pharmacology module is brilliant, coz there’s a huge science range in it and all that science stuff has stayed with me, even in my own life I’m recognising drugs, I think it makes you a real….you know a broader nurse….so I definitely think that the full module is definitely needed” P2

“The lecture was kind of, it can be very wordy, it was hard to be interested in it, very science…y,…in the lecture there was never an example really of an actual person that this [a medication] could be used on, it was always ‘this [a medication] does this and it’s for this’, but it was never like ‘this does this for a person’. It’s hard enough to relate it back to an actual setting” P3

The dichotomy in participants’ views was also linked to participants preferred learning styles and whether or not they felt that the module met their preferred style. This notion is illustrated in the following participant quote where the participant expressed difficulty with the module, followed by a recommendation for a more visual teaching approach as this suited his/her particular learning style.
“It was a lot to take in and it was difficult to understand...maybe more visual stuff...that would be helpful” P6.

Although there were mixed views regarding the pharmacology module, all participants positively commented on their learning experiences in the clinical skills laboratory sessions. This positive perception was enhanced by the fact that participants considered the clinical skills laboratories to be a safe learning environment and a conduit for linking knowledge and practice.

“It is a good way to learn because for people in a big lecture hall with two or three hundred other students and you’re just kind of going oh my god I’m like a lost sheep in here but in the labs you’re more inclined to get involved because it’s so small and so informal and its comfortable like, you’re kinda in a comfort zone” P5.

An issue raised during discussions with some participants related to the delivery of the module and the fact that the lecturer had a professional background in pharmacology rather than nursing. Two participants felt it was of benefit to the module to have a lecturer with a pharmacology background, whereas another two participants expressed a desire for a lecturer with a nursing background. Again this was linked to participants’ views on the balance of biological and nursing science with regard to medication management.

“It was a pharmacist, I thought that was very interesting and it was good the way they brought in the pharmacy side of things, it helped me understand things on a wider level” P12.

“It was a pharmacist that was teaching us, whereas if it was a nurse....some of the lectures could be case studies and linking the different types of drugs and the families of drugs into case studies, whereas it was very as you’d say scientific, you kind of lose interest in it” P10.
Participants spoke freely and openly regarding the timing of the pharmacology module during their BSc Nursing programme. Participants expressed a mixture of views as to when they perceived to be the ideal timing of the module. Two participants would prefer the module in first year, one participant identified that the module would be more beneficial in fourth year - just before the clinical internship commences. A further four participants expressed an opinion that a pharmacology module should be delivered during each year of the BSc Nursing programme.

“I do think that maybe an additional module or even if that module continued every year that you start at year one.......and it grew each year and that maybe you could build on your knowledge and relate them in each placement” P2.

Noteworthy within this study was that even though participants did have medication management addressed in most modules during each year of the BSc Nursing programme, eight participants did not perceive this to be happening. However, four participants identified that even though there wasn’t a timetabled pharmacology module each year, medication management was addressed throughout other modules during the four year BSc Nursing programme.

“Even this year now, the pain management, there’s a good part of pharmacology in it” P7.

Within the discussions, participants identified assessment strategies in the pharmacology module and indicated that multiple choice questions as an assessment method was unhelpful. Based on this and through probing questions regarding assessment strategies, participants suggested case studies as an assessment strategy that promoted learning. All participants had experienced case studies in other modules and indicated that they perceived them as an excellent
learning strategy. Participants identified that in other modules which used case studies as assessment strategies, that learning occurred during their own case studies and learning also occurred from listening to other student presentations of case studies.

“It’s when you relate it to the patient, even I find learning wise if I’m given a case study, I’ll remember a case study about something more than I’d remember just a lecture on the condition” P9.

Following on from the pharmacology module, the discussion about embedding knowledge in practice led onto participants’ perceptions regarding their clinical placement in the clinical learning environment.

4.3.2 Clinical placement

The next subtheme to emerge was clinical placement. This subtheme highlighted the importance of clinical placement in the clinical learning environment to participants.

Participants positively viewed the clinical learning environment as an essential arena for embedding knowledge in practice with regard to medication management. This was evident as participants repeatedly referred to positive experiences in the clinical learning environment and expressed the view that they looked forward to their scheduled clinical placements. Clinical placement in the clinical learning environment was seen as an integral aspect of learning and an essential component within the BSc Nursing programme. To assist the process of embedding knowledge in practice, participants identified the need to link theory and practice in a ‘real world’ setting and the necessity of the clinical learning environment in this process. While, participants expressed the view that learning
in university was important they also identified its limitations and emphasised the importance of time spent in the clinical learning environment to bridge the theory practice gap.

“There’s only so much you can learn in university, I think it’s just doing it [medication management] in the hospital that you get used to it and it all comes together” P8.

All participants spoke positively of the importance of their clinical placement experiences. Participants used phrases like “linking it” P5, “interlinking” P10, “relating it” P9, “picturing it” P2, “making sense of it” P1, “fulfilling your learning” P11 and generally they spoke about it “all coming together” P8. Although the university and the clinical learning environment are both fundamental components of the undergraduate nursing students’ professional education, participants in this study appeared to recount the importance of their clinical placement in the clinical learning environment with higher regard.

Participants also discussed the use of information sources which aided their quest to embed knowledge in practice, particularly relating to medication. A preference for technology enhanced information sources was evident.

4.3.3 Technology enhanced information sources

This subtheme identified how participants used technology to aid their learning in medication management. In the clinical learning environment, information sources were used by participants. These sources included traditional ‘hardcopy’ information sources and technology enhanced information sources. However, participants expressed a preference for technology enhanced information sources
as they felt they were more reliable and easier to access than the traditional information sources.

Many ‘hardcopy’ traditional information sources in relation to medication management were identified, such as patient notes, ward information, manufacturers’ information, BNF (British National Formula) and MIMS (Monthly Index of Medical Specialities) books. However, despite the availability of ‘hardcopy’ traditional information sources, participants expressed a preference for technology enhanced information sources, particularly medication management programmes or applications (apps) which were accessible on smartphones. Participants expressed the view that the information provided by technology enhanced information sources was more reliable than ‘hardcopy’ sources as they were regularly updated. It was also expressed that smart phone apps were more readily available and easily accessible. It is noteworthy to point out here that the participants did not express any concerns as to the provenance of technology enhanced information sources and whether they were actually reliable or not. In the following quote, the participant talked about how smartphone apps are more up-to-date and reference is made to the Food and Drug Administration (FDA), a United States based agency within the U.S. Department of Health and Human Services. No reference was made to local agencies such as the Irish Health Products Regulatory Authority or even the European Medicines Agency, which would have been more appropriate to the participants’ clinical context.

“Well they’re not updated as much [books], whereas the apps every few weeks it will come on, it will tell you like it’s time to update the app so you’ve to update it again, that’s really good, then it gives you alerts to drugs that have been taking off and alerts that drugs are dangerous and it gives you the reason why and why they, the FDA or
While participants found technology enhanced information sources more readily available and easier to access, they expressed concerns as to whether using technology in the clinical learning environment was permissible. Furthermore, participants expressed the view that accessing medication management apps needed to be done covertly to avoid being mistakenly accused of engaging in personal matters such as texting friends. However, participants witnessed other clinical staff covertly using technology enhanced information sources on smart phones and therefore felt it was okay to mirror their actions.

“I know you’re not supposed to have phones on the ward either, sometimes it comes in handy….you would see some of the nurses taking out their phones and going to the apps like” P4.

In this theme participants discussed aspects of their education which facilitated or hindered them in a quest to embed knowledge in practice. In the following theme, participants perceptions and experiences of engaging in practice with regard to medication management is presented.

4.4 Engaging in practice

This theme captured participants’ perceptions and experiences of engaging in practice and availing of learning opportunities during their time in the clinical learning environment. In Ireland, clinical learning environments range from hospital settings to community care setting (An Bord Altranais 2005). The clinical learning environment provides undergraduate nursing students with opportunities for practice-based learning which enables them to develop competencies to become safe, caring and competent practitioners. In this environment, students are
engaged in a preceptorship programme. Preceptorship is a one-to-one educational relationship between a registered nurse and a nursing student. The preceptor provides direct clinical supervision to the undergraduate nursing student (the preceptee) and directly interacts with the student in the clinical learning environment.

In this study, participants openly discussed their engagement in practice in the clinical learning environment. Preceptorship and support were identified as key elements in the participants’ preparation in medication management. Positive and negative aspects were conveyed. Within the aspect of support, participants referred to multiple sources of support such as the multidisciplinary team members, peers, nurses, nurse managers and patients. Participants also identified issues in the clinical learning environment which affected their ability to engage in practice. This embodied several issues such as the perceived lack of learning opportunities related to environmental factors such as logistics and timing. Missed learning opportunities were discussed and were attributed to the attitude of the preceptor and/or to the busyness of the environment. Finally, learning frameworks (such as competency assessment portfolios and clinical skills books) that encouraged students to identify and engage in learning opportunities were perceived as unsupportive due to a perceived lack of feedback. These areas are developed further under the subthemes of preceptorship and support and clinical learning environment.
4.4.1 Preceptorship and support

Issues arising under the subtheme of preceptorship and support included positive and negative aspects of preceptorship. Other members of the multidisciplinary team were identified who supported and contributed to the students’ development. Positive support from other nursing students was also recounted. In addition, participants spoke positively about listening to patients stories and how that assisted them in their quest for knowledge and understanding.

Preceptorship was considered very important to the participants and the preceptor was seen as a central figure in how the students developed and engaged in clinical practice. When preceptorship was perceived as ‘good’ it was seen as very rewarding. When it was perceived as ‘not good’, it was considered a major hindrance to the students’ development. Eight participants spoke about positive experiences with their preceptors, while six participants spoke about negative experiences. There is an overlap of numbers here and it’s noteworthy that most participants had negative and positive experiences. This was attributed to, firstly the willingness of the preceptor to engage with the student, and secondly to a culture of positive preceptorship which was tangible in some clinical sites. Participants felt that a culture of positive preceptorship, which was conducive to learning, was evident on some clinical placements and this was usually instigated by the person in charge, for example the clinical nurse manager. Positive experiences with preceptors were more likely to occur in clinical settings where a culture of positive preceptorship was perceived.

“the staff is obviously a huge thing, the CNM [clinical nurse manager], the very first day she, before anyone sat down to the report she brought us all into her office, asked us all our first names, do you
know introduced us to the rest of the staff, that’s a huge thing, you are just comfortable straight away, do you know, and then she assigned us all a preceptor, she was really involved with the CPC [clinical placement coordinator] about making sure we had constantly, as much as possible, the same preceptor and then just people who are willing to teach” P9.

Another aspect of this subtheme was multidisciplinary support. Other members of the multidisciplinary team were identified who supported and contributed to nursing students’ development - clinical nurse managers, clinical nurse specialists, clinical placement coordinators, pharmacists, doctors, newly qualified nurses, other student nurses and patients were all mentioned by participants. This multidisciplinary approach was perceived by participants as a positive support, as is evident in the following quote.

“There was one pharmacist there....if you ever had a problem now you could approach her.....she was actually very good. She was better than some of the nurses, but I suppose that’s her profession you know what I mean...she was always going to be” P11.

Just over half of all participants spoke about the positive support they felt from other nursing students. The following participant spoke about the support that arises from having another student at the same stage of the undergraduate programme with you on clinical placement.

“It’s great to have another person on the same level so you can kind of bounce off each other; I suppose it always kind of makes you feel better to have someone else there.... I would have always asked anyway another student first if I didn’t know something, did they know it like?” P5.

Within the interviews, participants spoke positively about listening to patients experiences and how that assisted them in their quest for knowledge and understanding.
“Patients who had the knowledge on their condition themselves, especially things now let’s say when I was in second year – diabetes and the insulin and everything you’d find the patient’s themselves with type two would tell you more, they could tell you more than the nurse about when it suits them to take it, if you were taking their blood sugar and it seemed high, they’d be like oh no that’s because…….you’d learn lots from the patients too” P9.

Preceptorship and support were central aspects of participants’ ability to engage in practice. However, other aspects in the clinical learning environment were also identified and these are presented next.

### 4.4.2 Clinical learning environment

This subtheme identified issues in the clinical learning environment which affected participants’ ability to engage in practice. Findings included participants’ perceptions that the availability and accessibility of learning opportunities in the clinical learning environment were inadequate. This was interlaced with environmental factors such as the logistics of where the student was placed and the length of time spent on the placement. Missed learning opportunities were discussed and were attributed to the attitude of the preceptor and/or to the busyness of the environment. Supportive learning frameworks (such as competency assessment portfolios and clinical skills books) that encouraged students to identify and engage in learning opportunities were seen as unsupportive due to a perceived lack of feedback.

Eight participants discussed learning opportunities in the clinical learning environment and how this is influenced by the range of placements encountered and the duration of the placements. Participants identified that longer placements contributed to better learning opportunities. However, despite the length of time
spent it was evident that participants considered certain clinical learning environments as synonymous with providing good opportunities, whereas others were considered as lacking in opportunities. These placement choices were out of their control. Participants perceived that more opportunities to engage in medication management were associated with being in an acute setting. This may be attributed to the fact that participants’ understanding of medication management was inherently linked with the ‘medication administration’ which is more common in acute settings and not having a placement in an acute setting was perceived as negative.

“It can be very luck of the draw really; you mightn’t have had a placement in an acute setting in a few months so you miss out then”

P3.

However, even when medication management learning opportunities were available in the clinical learning environment, this did not necessarily mean that participants availed of these opportunities. Participants identified ‘missed opportunities’ and attributed these to unsupportive preceptors and to a busy environment, which often meant that students were delegated other work resulting in them missing out on opportunities to be involved in medication management activities. This view was expressed by the majority of participants.

“It’s up to us to be like oh I’ll do the drug round and you could be in the middle of that drug round with them and a bell will go off and it’s the student that there’re going to send off to answer the bell, you know what I mean and then you could be gone and the drug round is over and you’ve missed it….everything”
P10.

Interestingly, four participants accepted that they had a role in the ‘missed opportunities’ and spoke about a need to ‘make opportunities’ for themselves.
This acceptance highlighted the emergence of participants’ awareness of professional responsibility.

“You’re just sent away and it’s, maybe it’s kind of a fault, let’s just say my own, on myself, you know it might be my own fault, let’s just say, say no, look lads, I need to learn this……I’d say I’m going to have to make the opportunities come up” PII.

In-keeping with current times, the busyness of the clinical learning environment was often mentioned and was seen as a major hindrance to learning. By referring to the ‘busy environment’ participants were talking about the busyness of the nurses and the busyness of the environment. Participants expressed empathy for the nurses and felt that they tried their best to engage students yet they also expressed the view that the busy environment negatively impacted on the accessibility of learning opportunities.

“They’d [nurses] do their best to keep you on but there’re so understaffed as well, it’s hard on them too and you can see that and you can understand that but it’s, it’s a difficult situation for the student you know” PII.

Highlighted within the study was the need for more structure and guidance for students while trying to engage and learn in the clinical learning environment. During clinical placement, students need to achieve identified clinical competencies in order to successfully progress through their programme. Students must identify the knowledge, attitudes and skills necessary to achieve these competencies and consequently this means identifying clinical learning opportunities to allow them to practice. Within the undergraduate programmes, there are supportive learning frameworks available in the clinical learning environments that support the student in this learning process. In this study, participants identified and talked about frameworks such as their competency
assessment portfolio, clinical skills books and medication portfolios. However, it was evident that participants perceived that their current learning frameworks were not supportive and this was directly related to the perception that supervision or feedback was not happening. As participants perceived that supervision or feedback were not occurring, these structures were seen as unhelpful. Many participants were eager to make suggestions for improvements for example ‘a protocol’ \textit{P10} or ‘a workbook’ \textit{P9}. However, it was noteworthy that a majority of participants expressed a desire for a specific medication competency assessment.

“If medication management in particular was more structured in the clinical setting, like we have our modules here [university] but there’s no structured actual learning of medication management in placement, if there was some kind of medication competency that would really help” \textit{P3}.

However, all suggestions had a common thread, which was that someone might actually validate or guide their learning in medication management through supervision and feedback.

“We’ve a skills book and as I say there’s rakes of skills in it but nothing happens with it at the end, you know what I mean” \textit{P11}.

“Even if we had some kind of checking up on how you’re getting on with it or are you having any chance to do it, coz it’s very much self-directed learning” \textit{P3}.

To sum up, this theme captured participants’ perceptions and experiences of engaging in practice with regard to medication management. Preceptorship and support were identified as key elements in this process. Within the aspect of support, participants referred to multiple sources of support such as the multidisciplinary team members, peers, nurses, nurse managers and patients, through listening to their stories. Participants also identified issues in the clinical
placement environment which affected their ability to engage in practice such as perceived lack of learning opportunities and missed learning opportunities. Learning frameworks (such as competency assessment portfolios and clinical skills books) that encouraged students to identify and engage in learning opportunities were perceived as unsupportive due to a perceived lack of supervision and feedback. Towards the end of participant interviews, the discussion moved towards professional responsibility. All participants conveyed positive views about taking responsibility for their own learning, this is presented below.

4.5 Accepting professional responsibility

The fourth and final theme was accepting professional responsibility. Within this theme, participants conveyed their views regarding their upcoming role in medication management during their clinical internship. A broad spectrum of emotions was expressed by participants, ranging from excitement to fear and anxiety. Participants expressed a desire for reassurance but did not openly look for this reassurance during clinical placement as they didn’t want to be perceived as not knowing. Therefore, in an attempt to gain reassurance the participants began to question their own abilities and consulted with their peers. Participants expressed a strong desire to fit in and be accepted and to ‘belong’ to the clinical team. While participants sought reassurance and had a sense of being unprepared, they also recognised that the clinical internship was not the end of the road in their learning journey. All participants identified that it was their professional obligation to take responsibility for their own learning and they expressed an appreciation for self-directed and lifelong learning. There was an acceptance that
they would need to continually update and engage with further learning in medication management and other areas of practice. These issues are addressed under the subthemes: perceptions of a future medication management role and personal responsibility for learning.

4.5.1 Future medication management role

All participants were about to embark on a clinical internship and discussed their expected upcoming role in medication management during the internship. Participants expressed mixed emotions regarding their anticipated role, ranging from being excited about it to being afraid. Furthermore, participants were not entirely sure of what was expected of them as final year students on the clinical internship. This created confusion and led to participants questioning themselves and comparing their clinical knowledge and abilities with other fourth year nursing students. A number of participants referred to their fears of getting judged by clinical staff and not measuring up to standard. It was evident that they were questioning their credibility as final year students.

“All your classmates have done stuff and you’re like oh my god, they have done that and I haven’t done that, I must be terrible” P2.

“I just think as fourth years there’re [clinical staff] going to expect a lot from us about medication. I know it’s going to be ‘you’re fourth year now you should know this’ and that’s what we’re going to be hearing. I know it’s going to be ‘well you should know this now, you’ve done it in college now and you’ve been out on the wards for three years. Oh god, I’m so afraid of that happening to me’” P10.

Ultimately, having a sense of belonging and wanting to be an accepted member of the clinical team was expressed by participants as an important dimension of their upcoming role during the clinical internship. This was highlighted by a majority
indicating that a process of adaptation and socialisation had already begun whereby participants were role transitioning from supernumerary nursing student to final year student on a clinical internship. They anticipated that being an accepted member of the clinical team, one would have a contribution to make.

“It’s something as a final year student, you want to be able to do things on the ward, to be part of the team, being able to do the drug kardex and to do it right and to be confident about it, you’re not in first year anymore, things are expected of us now.” P1.

This subtheme presented participants’ perceptions of their upcoming role in medication management during the clinical internship. In another subtheme, participants looked to the future and recognised the importance of self-directed and lifelong learning and this is discussed below.

4.5.2 Responsibility for own learning

While half of participants felt they were unprepared for their clinical internship role, others recognised that the internship was not the end of the road and that their learning trajectory regarding medication management would continue long after the clinical internship ended. Despite participants’ mixed emotions, each participant was clearly aware of their personal responsibility for learning and expressed positive views regarding responsibility, motivation and initiative. Participants indicated they had regularly engaged in self-directed learning regarding medication management. It was noteworthy in this study that at undergraduate level, participants were already taking responsibility for their own learning.

“It’s up to you to highlight I don’t feel competent.....I had to do that myself, I had to ask for my own CPC to give me a site where I could do more [IM injections] because I felt I hadn’t enough, now it was
nobody’s fault it was just a matter of where I was at that time, just logistics, so I had to kind of highlight it, so you do have to highlight where you feel that you’re lacking and where you feel you should be improving so it’s definitely very self, self you have to be self-aware about how much you fall down and how much you think that you know and then of course develop on that further” P2.

“You’re an adult learner as well and it’s very important that you take responsibility and as a nurse you are constantly learning as well, so you have to take responsibility and develop the knowledge you have..... you need to develop yourself. I found myself if I needed to know something about medicines, I would take a bit of time and go off and research it and learn about it” P4.

An appreciation for lifelong learning was also expressed. Participants indicated that lifelong learning would be an integral aspect of their future professional practice.

“Sure its lifelong learning, the nurses even say the medications change or a new drug comes along....you will spend your whole career as a nurse, drugs will change and new information will come out about drugs, even talking to nurses just when I’m working and they still have to go back and do it.... I suppose you will always have to keep your skills up to date you know, it is a lifelong learning” P1.

This final theme indicated that participants were already taking professional responsibility for their learning and recognised the need for lifelong learning in relation to their future nursing roles in medication management. A chapter summary follows.

4.6 Chapter summary

The four themes emerging from data analysis are presented above. The themes, derived from analysis of twelve participant interviews utilising Burnard’s (2011) framework for thematic content analysis were developing an understanding, embedding knowledge in practice, engaging in practice, and accepting professional responsibility for learning. Participant quotes that illuminated
findings most appropriately were included. A brief interpretation of the data was offered. A more detailed discussion and critical analysis of the findings with regard to current literature takes place in chapter five.
Chapter 5: Discussion of findings
Chapter 5: Discussion of findings

5.0 Introduction

This study explored the perceptions of fourth year nursing students regarding their educational preparation in medication management. The voices and interpretations of the participants in this study were fundamental to understanding this phenomenon and provided the foundation for this research (Polit and Beck, 2013). Four themes emerged following data analysis developing an understanding, embedding knowledge in practice, engaging in practice and accepting professional responsibility. This chapter discusses and critically analyses the study findings in relation to national and international literature. The discussion of findings is presented under the four identified themes.

5.1 Developing an understanding

This theme captured participants’ understandings of medication management. Within the interviews, participants’ initial responses were limited and focused on medication administration. However, participants were considering wider issues and developing their understanding of the general principles and responsibilities of medication management. The subthemes that informed these themes were; the meaning of medication management and wider issues in medication management.

5.1.1 The meaning of medication management

It was important to explore what medication management meant to the study participants as this was the fundamental concept of the research. Medication management encompasses all the activity that is involved in meeting the needs of
a person who is prescribed medication (Hemingway et al. 2011) and the nurses role in this is a complex one (Bullock and Manias 2002). The Nursing and Midwifery Board of Ireland describe medication management as the facilitation of safe and effective use of prescription and over-the-counter medicinal products (An Bord Altranais 2007a). It involves assessment, planning, implementation and evaluation in collaboration with other key healthcare professionals. Furthermore, medication management is more than just a technical skill, it involves cognitive skills such as decision making and professional judgement, as well as psychomotor skills like preparation and administration of medicines (Brady et al. 2009).

Through the interviews collectively, study participants referred to many aspects of medication management and appeared to have awareness of the general principles and responsibilities involved, similar to that described by the Nursing and Midwifery Board of Ireland (An Bord Altranais 2007a). However, similar to findings by King (2004) participants understanding of medication management was limited. At an individual level, the overarching response and concerns of participants were about medication administration. Participants expressed feelings of anxiety related to the perception that they hadn’t had enough experience in medication administration. Medication administration is a fundamental nursing role (Morrison-Griffiths et al. 2002). In the clinical learning environment, administering medications is an important skill for nursing students to acquire as it is a major facet of nursing care (Bourbonnais and Caswell 2014). Engaging in medication administration tasks can be stressful for nursing students as they are high risk occasions for making mistakes which could result in negative patient
outcomes (Castledine 2007). Nursing students’ fears about the medication administration are not unfounded as it is reported in the literature that undergraduate students are involved in medication errors and ‘near misses’ (Reid-Searl et al. 2010).

Participants also reported difficulty with the quantity of different medications and with the inconsistent use of pharmaceutical language by staff regarding generic and trade medication names. Rather than focusing on broader principles, participants honed in on trying to recognise and ‘learn off’ the medications. This caused a lot of distress and feelings of being overwhelmed. This echoes the work by Manias and Bullock (2002a) who found that rather than focusing on fundamental principles, students were concerned about the actual number of medications they had to learn and this involved the memorisation of isolated and numerous facts relating to particular medications. While knowing and recognising medications is important, it is also important that students’ have awareness of the theoretical underpinnings of medication.

Medication administration is just one aspect of medication management but it is also probably the most obvious aspect. Interpretation of participants’ limited understanding of medication management, particularly focused on the task of medication administration, would suggest that they were progressing through a learning trajectory. Such a journey often begins by participating in routine skills and mirroring the attributes of the professional nursing team with whom the participants interact (Henderson, 2012). Participants in this study were final year nursing students about to embark on a clinical internship. Current nursing research regarding role transitioning acknowledges that it is a stressful time for students
and focusing on specific clinical skills or tasks, fitting in with the team and generally just trying to cope with the realities of real clinical practice are often priorities for students (Parker et al. 2014, Deasy et al. 2011). Often, the result of this stressful time for transitioning students is a clash between the professional value of patient-orientated nursing and the organisational value of task-orientated nursing (Feng and Tsai 2012). Medication administration is an obvious, regularly occurring task in the clinical learning environment (Castledine, 2007) and nursing does have a tradition, albeit a diminishing one, of task orientated work (Henderson et al, 2012). The literature supports the approach taken by students in this study, highlighting that students tend to focus on specific tasks such as medication administration or on the memorisation of isolated and numerous facts relating to particular medications rather than focusing on the fundamental principles and responsibilities of medication management like patient education and patient safety (Manias and Bullock 2002a).

5.1.2 Wider issues in medication management

Participants were developing their understanding to include wider interpretations about medication management rather than one-dimensional task-orientated views. While at an individual level, participants’ initial understandings revolved around medication administration, collectively wider issues were highlighted including the changing role of the nurse, the role of the multidisciplinary team, patient education and patient safety. Participants did have an awareness of the links between medication safety and patient safety and recognised they played a role in this. It was interesting to note that while acknowledging the changing role of the nurse in relation to medication management, participants did not comment on
nurse prescribing (Drennan et al. 2014). In Ireland, registered nurse prescribers, are actively prescribing and impacting on health services by providing innovative, responsive and appropriate service delivery (Creedon et al. 2009). The fact that this was not raised by participants suggests that they did not have contact with nurse prescribers in the clinical learning environment. If participants did have contact, than this was not recognised suggesting maybe an ambiguity aspect to the nurse prescribing role. Perhaps nursing students’ limited exposure to speciality placements might go some way to explain this, considering that the representation of nurse prescribers would be stronger in more specialist areas where advanced levels of nursing practice are delivered (Drennan et al. 2014).

Participants’ references to wider issues in medication management suggested that they were developing their knowledge, attitude and skills in this area and were progressing through a learning trajectory. Over the years, educational theorists have published several models to describe the development of knowledge and the educational trajectory involved in achieving competence (Miller 1990, Dreyfus 1986, Benner 1984, Kolb, 1976). Defining nursing competence is difficult and many definitions exist in the literature. Cowan et al (2005) describe competence as a complex combination of knowledge, skills, performance, values and attitudes. In an integrative review of the literature, Sulosaari et al. (2010) identified eleven competency areas that constitute nurses’ medication competence: i) anatomy and physiology ii) pharmacology iii) communication iv) interdisciplinary collaboration (v) information seeking (vi) mathematical and medication calculation (vii) medication administration (viii) medication education ix) assessment and evaluation (x) documentation and (xi) promoting medication safety as part of patient safety. It is notable that participants in this study did refer
to most, but not all of the competency related areas described by Sulosaari (2010) when they elaborated on their understanding of wider issues in medication management. However, not all aspects were raised and interpretation of findings suggests that participants were developing their knowledge and understanding of medication management and some were further along in this learning trajectory than others.

Overall in this theme, participants were developing their knowledge, skills and attitudes related to medication management. The learning journey of participants represented in this study is consistent with educational theories on how students develop their knowledge and skills (Miller 1990, Dreyfus 1986, Benner 1984, Kolb, 1974). In the next section, how participants related this knowledge to their practice is discussed.

5.2 Embedding knowledge in practice

Embedding knowledge in practice is the second theme in this study as participants’ described ways in which they strived to develop their knowledge and relate it to their practice. If nursing students are to prepare for the reality of their professional role, they need opportunities to integrate knowledge and practice. It is necessary to integrate the ‘knowing what’ with the ‘knowing how’ (Midgley 2006). An essential element in developing knowledge was the structured learning regarding medication management that occurred in the university setting, particularly the pharmacology module. Participants viewed their clinical placement in the clinical learning environment as an integral aspect of learning and an essential component within the BSc Nursing programme. Within the clinical learning environment, participants spoke about the use of information
sources as a means that assisted them in their quest to embed knowledge in practice. A move towards technology enhanced information sources as opposed to the traditional ‘hardcopy’ sources was evident. These areas are discussed below under the following subthemes; the pharmacology module, clinical placement, and technology based information sources.

5.2.1 The pharmacology module

Participants indicated that the pharmacology module played an integral role in their quest to embed knowledge in practice. For participants, the pharmacology module occurred in the second year of their undergraduate programme. The pharmacology module included weekly lectures and clinical skills laboratories teaching sessions. There was a split in opinion regarding the helpfulness of this module and this was related to participants’ perceptions of an appropriate balance between biological and nursing science content. Some expressed the view that a scientific approach to medication management enhanced their education in this area, while others expressed the view that there wasn’t enough nursing science and this limited their opportunities to link theory and practice. In the literature, there is on-going debate as to what constitutes an ideal programme in relation to pharmacology for nursing students (Meechan et al. 2011, Bullock and Manias 2002, Latter et al. 2001). It is argued that the biological sciences have as much relevance as nursing sciences in pharmacology education (Morrison-Griffiths et al 2002). In the context of this study, findings indicated that nursing students had divergent views as to the appropriate balance of pharmacology content in the curriculum. However, it was evident that participants were more concerned with the application of knowledge to practice rather than the theoretical underpinnings.
of the science of pharmacology. This finding concurs with Parker et al. (2014) who identified that nursing students often focus on practical issues rather than theoretical underpinnings in an attempt to cope with the realities of clinical practice.

Variances in personal learning styles may have also contributed to the conflicting views regarding the helpfulness of the pharmacology module. Participants expressed preferences for certain learning styles and suggested that this may have influenced their perception of the pharmacology module. There are many different conceptions of ‘learning styles’ but generally they can be described as a person’s preferred way of perceiving, organising and retaining information (Strayer and Beitz, 2010). In a study about learning style preferences, Hallin (2014) found that most nursing students were flexible in their preferences but having an awareness of such styles does provide valuable awareness for the student and the teacher. Findings from this study suggested that students had awareness about learning styles and appraised the pharmacology module on the merits of how well it suited their preferred learning style. Flexible teaching methods that complimented their styles were valued more. However, a learner’s experience of the learning process is not solely based on learning style preferences. It is also influenced by the educators’ approach to teaching and by the learning environment (Herrington et al. 2014).

Although there were mixed views about the pharmacology module, all participants expressed positive views about learning medication management in the clinical skills laboratories. Participants had an innate preference for practical learning and viewed the clinical skills laboratories as a safe environment for
learning and a conduit for linking knowledge and practice. This finding is not unique and is echoed in other studies (Raphaela-Godson et al. 2007, Morgan 2006, Freeth and Fry 2005). Preferences for the practical side of learning would not be unusual in practice-based educational programmes where the integration of theory and practice is paramount (Parker 2014, Stanton and Grant, 1999).

In this study, positive and negative views about the professional background of the lecturer were raised. Some expressed a desire for a lecturer with a nursing background, whereas others found it interesting to have a lecturer with a pharmacology background. Divided opinion as to who should teach pharmacology to nursing students has been reported in several studies (Morrison-Griffiths et al. 2002, Latter et al. 2001, Latter et al. 2000). However, Latter et al. (2001) found that the background of the person teaching pharmacology was irrelevant as long as the person teaching provided opportunities for students to integrate pharmacology theory with nursing practice issues. Participants’ mixed views about the pharmacology module in this study may reflect their varying learning styles, as previously mentioned, but it was also related to a perceived lack of opportunities to integrate pharmacology knowledge with nursing practice during the pharmacology module. Dissatisfaction regarding opportunities to integrate knowledge and practice was echoed by participants when they spoke about the assessment strategies employed in the module. Participants expressed disquiet about their assessment formats, particularly multiple choice questions, stating it did not allow for integration of knowledge and practice. It is noteworthy that just under half of all participants expressed a desire for ‘case studies’ as an assessment strategy as they had experienced this in other modules. Case studies are teaching and assessment strategies which usually involve the description of real life cases.
which are drawn from the real world of professional practice. Case studies commonly involve decisions, challenges, problems or opportunities which are used to evoke students’ critical thinking skills and promote the integration of knowledge and practice (Yoo and Park 2014, Kunselman and Johnson 2004). Case studies have been shown to be effective strategies in nurse education (Popil 2011, Lovat and Toomey 2009) and considering that pharmacology teaching requires considerable clinical application, they are particularly useful for nursing students (Banning 2003, Latter et al 2000). However, Popil (2011) reports that despite overwhelming evidence of their efficacy, case studies are still underutilised by nursing educators. Findings from this study indicated that participants perceived their assessment strategies in pharmacology did not allow for integration of knowledge and practice and a preference for case studies was evident.

In the literature, there are many different approaches advocated with regard to the delivery of pharmacology modules, such as a separate subject with integrated components (Bullock and Manias 2002) and an integrated curriculum approach (Meechan et al. 2011). Similar to these findings, participants in this study expressed divergent views as to how and when the pharmacology module could have been delivered. Participants were exposed to a pharmacology module in the second year of their programme. Furthermore, medication management education was integrated in other modules and ascended throughout the four years of their programme. However, this was not perceived by the majority of participants in this study. This finding suggests that nursing students need definitive structure to their medication management education and would benefit from pharmacology content in each year of their programme.
Within this theme, participants’ perceptions regarding their structured learning of medication management in the university was discussed. However, embedding knowledge in practice also occurred in the clinical learning environment and in the following subtheme, the importance of clinical placement as perceived by participants is discussed.

5.2.2 Clinical placement

This subtheme captured participants’ perceptions regarding their clinical placement in the clinical learning environment. Within the theme *embedding knowledge in practice* participants repeatedly referred to positive experiences in the clinical learning environment. They looked forward to their clinical placements and regarded them as an essential component of the BSc Nursing programme. Similar to other allied healthcare professional education, learning in a clinical learning environment is an essential component of undergraduate nursing programmes and experiences in the real world of practice shape students’ professional development (Henderson, 2012). Participants recounted many challenges when engaging in practice (these challenges are acknowledged in the theme *engaging in practice*). However, they indicated that their experiential learning on clinical placement was irreplaceable and placed more emphasis on their learning in real life practice than on learning in the university.

There are many published studies which focus on the experiences of nursing students in the clinical learning environment and recommendations for more positive learning environments are advocated (O'Brien et al. 2014, Kristofferzon et al. 2013, Henderson et al. 2012). The findings presented in this thesis revealed
that despite the challenges nursing students face in the real world of clinical practice, they positively viewed their clinical placements in clinical learning environments and in relation to medication management they considered them fundamental for embedding knowledge in practice. This finding correlates with Anderson and Kiger (2008) who found that nursing students placed high value on their time spent in clinical practice.

Contemporary healthcare is becoming more complex and demanding. Due to the complexities of healthcare, there are now greater requirements for clinical learning environments than ever before (Thistlethwaite and Jackson 2014). This places strain on an already burdened health care system. Greater requirements coupled with educational requirements and standards means that clinical placements in clinical learning environments for healthcare students are becoming more difficult to source (Barnett et al. 2008). Innovative ways of addressing this difficulty and providing alternative options to the clinical learning environment are more common in current healthcare literature (Chipchase et al. 2014). Some innovative suggestions for replacing, reducing or supplementing requirements for students’ clinical placements in the clinical learning environment include i) education in simulated learning environments (Watson et al. 2012), ii) simulations underpinned by inter-professional educational principles (Williams et al. 2009b), iii) human simulations (Cant and Cooper 2010) and iv) telesupervision (Chipchase et al. 2014). Telesupervision involves distant supervision of students in the clinical learning environment by the use of electronic information and communication technologies (Chipchase et al. 2014). Substituting the clinical learning environment with simulated practice learning for nursing students began in the UK in 2008. Designated simulated learning environments are now used to
substitute direct clinical care hours in the practice setting (Wilford and Doyle 2006). Findings from an evaluation by Ricketts et al. (2012) indicated that the support of direct care hours through simulated practice learning can permit students to practice essential clinical skills in a designated clinical skills suite. However, a study by Watson et al. (2012) found that physiotherapy students’ achievements of clinical competence were no better or worse in simulated learning environments compared to the traditional clinical learning environments. Findings from this study indicated that nursing students felt strongly about the importance of their time in the clinical learning environment because of the ‘real life’ opportunities it provides for linking theory and practice. These findings correlate with (Williams et al. 2009a) who found that while paramedic students positively viewed the simulated learning environment, they did not want them to replace their time in the real life, hands-on clinical learning environment. There is no doubt that reducing the burden of clinical placements in the clinical learning environment by replacing them with simulated learning opportunities described above may become more commonplace. However, the findings presented in this thesis are significant as they highlighted the value that participants placed on clinical placements in the real life clinical learning environment.

Moving on from clinical placement, the next subtheme addresses the use of technology enhanced information sources by participants in their quest to embed knowledge in practice.

5.2.3 Technology enhanced information sources

In this subtheme, participants spoke about information sources, particularly in the clinical learning environment, which aided them in their quest to embed
knowledge in practice. Sulosaari et al. (2010) identified information seeking as a factor in nursing students’ competency development. Medication management involves cognitive skills such as decision making and professional judgement (Brady et al. 2009) and to exercise these skills, nurses need to be informed by reliable evidence-based information sources (Ndosi and Newell, 2010). In order to provide safe care nurses seek information from many different sources (Sulosaari et al. 2010, Ramritu and Barnard 2001). Traditional information sources (such as ward books about medication management) and technology enhanced information sources (such as medication management applications for smartphones) were identified. It is not surprising to report that a move away from traditional sources towards technology enhanced information sources was evident in this study. Participants expressed the view that technology enhanced information sources were easily accessible on smart phones and more reliable as they were updated regularly. This finding concurs with Killam and Heerschap (2013) who found that increased accessibility of information is promoted through the use of technology. One participant spoke about the usefulness of an iPhone application where the FDA (a United States agency) provided updates on medications on a weekly basis. The participant felt this source of up to date information was unparalleled in traditional information sources like hardcopy books. While, there is no doubt that this is useful information, it does raise a concern about nursing students awareness of the provenance of technology enhanced information sources and whether or not they are fitting to the context of the students setting. In this instance, reference to national or EU agencies regarding medications rather than the FDA would have been more appropriate as medicines approved for use in the US may not be approved in the EU and vice versa. The trustworthiness, authenticity and
credibility of online technology must be considered by the user (Morley 2014) and participants in this study did not express any concern about such issues. Interpretation of this finding suggests that nursing students need guidance and education about the positives and perils of using online medication management programmes so that they can make informed decisions about their appropriate use.

Participants also raised concerns about whether or not using smartphones in the clinical learning environment was permissible. They also reported that they didn’t have any alternatives like access to the ward internet and this hindered their efforts to link theory and practice. However, despite this uncertainty, participants reported using smartphones anyway as they observed other registered nurses and healthcare staff doing this. Given that students often mirror the attributes of the professionals with whom they interact (Henderson, 2012), it is not surprising that participants mirrored the use of technology. Widespread use of electronic devices and technology enhanced information sources by nurses in the clinical learning environment is already acknowledged in the literature (Killam and Heerschap 2013). Ndosi and Newell (2010) advocated that within the clinical learning environment, access to trustworthy, authentic and credible information sources should be provided and promoted. Findings in this study suggest that further exploration of how the use of technology enhanced information sources by nursing students can be facilitated both safely and effectively. It is timely to explore the possibility of creating a more permissible culture towards the use of technology for providing reliable evidence-based information sources in practice.

Overall, in the theme embedding knowledge in practice participants’ described ways in which they strived to develop their knowledge and relate it to their
practice. Following on from this, discussions moved to the concept of engaging in practice where participants expressed their views regarding factors which facilitated or hindered them in their attempts to avail of learning opportunities in the clinical learning environment.

5.3 Engaging in practice

This theme captured participants’ perceptions and experiences of engaging in practice in the clinical learning environment with regard to medication management. Preceptorship and support were identified as key elements in the participants’ preparation in medication management. Participants referred to multiple sources of support such as multidisciplinary team members, other nursing students, nurses, nurse managers. Patients were also identified as a means of support as learning occurred for participants by listening to their stories. Another issue related to the clinical learning environment which affected participants’ ability to engage in practice was the perceived lack of meaningful learning opportunities in medication management. In addition, learning frameworks (such as competency assessment portfolios and clinical skills books) that aimed to encourage students to identify and engage in learning opportunities were perceived as unsupportive due to a perceived lack of supervision and feedback. The subtheme preceptorship and support is discussed next.

5.3.1 Preceptorship and support

In this study participants recalled positive and negative experiences with preceptors and reported that this affected their ability to link theory and practice. Participants also expressed the view that a culture of positive preceptorship was
evident in some clinical learning environments. This positive culture was attributed to the person in charge who welcomed and supported the students in a positive manner e.g. clinical nurse manager. In addition to the preceptor, the multidisciplinary team and other nursing students were also seen as positive supports. It was noteworthy in this study, that participants expressed the view that learning in medication management also occurred by listening to patients’ stories.

Current literature recognises the importance of a supportive learning environment for students with regard to preceptorship (Sundler et al. 2014, Kristofferzon et al. 2013), although not specifically in the context of medication management. Current research varies - some report students are satisfied with their preceptorship (Kristofferzon et al. 2013) while others report dissatisfaction (Papathanasiou et al. 2014). An Irish study by Frazer et al (2014) reflected international studies in that both positive and negative experiences with preceptors were reported and more opportunities to engage in the clinical learning environment were needed. A study specific to the supervision of nursing students regarding medication management was conducted by Reid-Searl et al (2009) in Australia. In-depth interviews with twenty-eight undergraduate nursing students revealed that quality supervision in medication management was not occurring (Reid-Searl et al. 2009). Similarly, in the context of this study, participants reported both positive and negative experiences with preceptors and expressed the view that this was related to the preceptors’ attitude to teaching. This correlates with current literature which suggests that the quality of supervision is directly related to preceptors who enjoy teaching and are interested in it (Sundler et al. 2014, Reid-Searl et al. 2010, Reid-Searl et al. 2008). A positive relationship between preceptor and student directly influences the experience that the student

121
has on clinical placement (Foley et al. 2013). Findings presented in this thesis indicated that if a culture of positive preceptorship was nurtured by the person in charge e.g. clinical nurse manager, then this affected the approach to preceptorship in that area, which led to a more positive experience for nursing students. When the clinical nurse manager was perceived as a role model for staff and led by example in promoting a culture of openness and support for student learning this created a positive culture within the clinical learning environment. These findings correlate with current literature in that a welcoming, permissive clinical learning environment is fundamental to the student experience (Broadbent 2014, Henderson, 2012).

Other members of the multidisciplinary team were also identified as supporting and contributing to students’ learning in medication management. Participants reported experiencing positive support from the multidisciplinary team and expressed the view that input from other healthcare professionals enhanced their learning opportunities. Medication management is multidisciplinary business that requires multidisciplinary management (Armitage et al. 2011). A multidisciplinary approach to learning medication management in practice is advocated in the literature as it helps foster an understanding of the contribution different professions make to the medication process (Page and McKinney 2007). It allows opportunities for students to practice open mindedness, flexibility and critical thinking (Killam and Heerschap 2013). However, a current study by Adhikari et al. (2014) found that multidisciplinary medication management education is not fully integrated in nursing education. In the researchers study, participants experienced and appreciated a multidisciplinary input with regard to their learning in medication management in the clinical learning environment.
Participants also experienced support from other nursing students in the clinical learning environment. The importance of peer support for nursing students is documented in the literature (Houghton 2014, DeAndrea et al. 2012). Positive aspects of peer support include sharing experiences, reinforcing knowledge and enhancing confidence (Ranse and Grealish 2007). The findings from an evaluation of a peer mentoring programme for nursing students by Gilmour et al. (2007) found that it encouraged collegial interaction and learning amongst nursing students. However, it was highlighted that such a formal mentoring programme requires considerable organisation and commitment. Findings from this study illustrated that positive peer support between nursing students is happening but unlike Gilmore et al (2007) it occurred in an unstructured, informal manner in the clinical learning environment. Peer support in this study, meant nursing students in the same year of a programme supporting each other. It was informal and did not occur in a professional, supervisory, teaching or appraisal sort of way. DeAndrea et al. (2012) also found that learning through peers promotes confidence and feelings of being connected. However, a literature review by Houghton (2014) advocated peer support but cautioned that it could have a negative impact, particularly if students congregated and isolated themselves from staff and potential learning opportunities in practice. Interpretations of findings presented in this thesis suggest that peer support is happening in an informal manner in the clinical learning environment and it is positively perceived by participants. Further exploration of this finding is warranted but was not possible within the scope of this study.

Participants also spoke candidly about how listening to patients stories aided their learning in medication management. There is a dearth of literature available on
how healthcare professionals can learn from patients. A study by Terrien and Fraser Hale (2014) advocated patients as educators for nursing students, stating that patients can bring life to multiple concepts and content areas, far more effectively than an abstract case, lecture, and/or bulleted slides. They also found that patients found teaching empowering and were proud to teach future nurses. Findings from the researchers study correlate with Terrien & Frazer Hale (2014) in that participants felt supported in their education by listening to patients, particularly in relation to learning in medication management. This source of learning warrants further exploration, particularly regarding the potential role patients could have in undergraduate nurse education. Patients’ perceptions of their role in supporting nursing students learning was not explored in the context of this study and also warrants further investigation.

In this subtheme, preceptorship and support from multiple sources were central aspects which affected participants’ ability to engage in practice. However, other aspects in the clinical learning environment were also identified and these are discussed next.

5.3.2 Clinical learning environment

It is well documented in the literature that the clinical learning environment is a major factor in supporting a developing nursing student (Papathanasiou et al. 2014, Killam and Heerschap 2013). This study highlighted several issues in the clinical learning environment that had a significant impact on participants’ ability to engage in practice. These included a perceived lack of quality learning opportunities, which was related to environmental factors such as the location and duration of clinical placement. Missed learning opportunities were reported and
were attributed to the attitude of the preceptor and/or to the busyness of the environment. Finally, learning frameworks (such as competency assessment portfolios and clinical skills books) were perceived as unsupportive due to a perceived lack of supervision and feedback.

The need for quality learning opportunities in the clinical learning environment is well documented in the literature (Sulosaari et al. 2012, Ndosi and Newell 2010, King 2004, Latter et al. 2001). Learning in the clinical learning environment requires integration of nursing students into clinical activities (Henderson et al. 2012) allowing students the opportunity to develop their knowledge, attitudes and skills in order to become competent practitioners (Killam and Heerschap 2013). Participants in this study perceived a lack of quality learning opportunities in relation to medication management. Similar to Killam and Heerschap (2013) it was found that the duration and location of placement were significant to the student experience and short duration placements in particular were seen to impede participants’ development. In this study, some clinical learning environments were seen as synonymous with good learning opportunities whereas others were seen as lacking. This may be linked to participants’ limited understanding of medication management, which was focused on medication administration and this was more likely to occur in acute clinical learning environments. If participants hadn’t a recent placement in an acute clinical learning environment, they felt they had missing out on learning opportunities in medication management. However, even when participants were placed in acute settings, they talked about missed learning opportunities and this was attributed to unsupportive preceptors and to the busyness of the clinical environment.
It is established in the literature that busy clinical learning environments negatively impact students’ ability to engage in quality learning opportunities (Broadbent et al. 2014, O’Brien et al. 2014). Similarly in this study, participants linked missed learning opportunities with the busyness of the clinical environment. Since medication administration usually occurs at the busiest times of the day, participants felt there was little opportunity to be involved as they were often delegated other work e.g. helping patients with meals. Participants reported positive experiences engaging in practice in quieter clinical environments. Unique to this study, participants were keen to express empathy for the nurse’s busy workload. However they still felt disadvantaged when they perceived that their preceptor was too busy to engage with them.

In addition, the need for more structure and guidance while trying to engage and learn in the clinical learning environment was expressed by participants. Learning frameworks which aimed to encourage students to identify and engage in learning opportunities while on clinical placement (such as competency assessment portfolios and clinical skills books) were perceived as unsupportive by participants and this was directly related to the perception that supervision or feedback on theses aspects was not happening. Participants were keen to make suggestions for improvement such as a ‘protocol’ or a ‘workbook’. It was noteworthy that the majority of participants expressed a desire for a specific medication competency assessment. However, all suggestions had a common thread, which was that someone might guide their learning in medication management through supervision and feedback. Similar to other studies, this finding suggests that in order for meaningful learning experiences to occur, more structured learning opportunities related to medication management in the clinical
environment are needed (Ndosi and Newell 2010, Morrison-Griffiths et al. 2002) and that structured educational initiatives, such as learning frameworks, need to be effectively utilised and are redundant without feedback (Killam and Heerschap 2013).

Despite the challenges to student learning reported above, participants in this study also spoke about blaming themselves for missed opportunities and taking responsibility to create new learning opportunities. Interpretation of this finding would indicate that an awareness of professional responsibility was emerging in participants. This finding is not linear and overlaps with later findings in theme four.

These findings align with current research (Kristofferzon et al. 2013) in that meaningful clinical learning opportunities need to be protected and encouraged in order to support student learning. There is very little published literature specific to learning opportunities in relation to medication management in the clinical learning environment, therefore findings from this study contributes to this topic. The fourth and final theme accepting professional responsibility is discussed below in relation to current literature.

5.4 Accepting professional responsibility

In the final theme, participants discussed their expected upcoming role in medication management during the clinical internship. Overall, it was accepted and demonstrated by participants that they had a professional responsibility to develop their knowledge, attitudes and skills in this area. Participants expressed mixed emotions ranging from excitement to fear. Furthermore, participants were
not entirely sure of what was expected of them as final year students on the clinical internship. Participants questioned their credibility as final year students. Perceptions of a future medication management role were also conveyed and participants expressed an appreciation for self-directed and lifelong learning.

### 5.4.1 Future medication management role

Participants expressed their views regarding their upcoming role in medication management as an intern in the impending clinical internship. Participants in this study were in the final year of their programme and therefore were in transition from supernumerary nursing student (surplus to the complement of registered nurses) to rostered intern (part of the workforce). There are several studies which report on role transition in nursing. However, studies about role transition of nursing students in the clinical internship are sparse, as most focus on the experiences of new graduates (Phillips et al. 2014). Considering the transition here is quite significant, involving becoming paid members of the clinical nursing team, with every two nursing students on clinical internship replacing a registered nurse position, findings from this study contribute to the body of knowledge available in this area. Similar to other findings about role transition (Deasy et al. 2011), participants in this study expressed mixed emotions about this upcoming role, ranging from being excited about it to being afraid. Participants questioned themselves and compared their abilities with other fourth year students. Fears of being judged and not measuring up to standard were expressed. Interpretation of this finding would suggest that participants needed feedback about their progress and this aligns with current research, in that students need reassurance and knowledge about what will be expected of them in their new roles (Houghton
Ultimately, participants wanted to feel like they belonged and had a contribution to make to the clinical team. This finding aligns with current socialisation literature (Houghton 2014, Feng and Tsai 2012). Professional socialisation in nursing is about becoming an ‘insider’, an accepted member of the clinical nursing team, one who makes valuable contributions (Tomietto et al. 2014). Participants’ fears of being judged, not measuring up and wanting to belong are consistent with some of the literature addressing socialisation (Houghton 2014, Tomietto et al. 2014) and suggest that a process of adaptation to their upcoming roles had already begun for participants in this study.

5.4.2 Personal responsibility for learning

All participants in this study spoke at length about taking a personal responsibility for learning. Half of all participants felt unprepared for their upcoming role, while the other half acknowledged that it was not the end of their learning journey. It was evident that participants perceived an on-going learning trajectory regarding medication management, one that would span through the internship and continue as a new graduate and even as an experienced nurse. Despite the mixed emotions expressed about their upcoming role, positive views about responsibility, motivation, initiative, self-directed learning and lifelong learning were expressed. It is reported that virtues such as motivation and initiative precede competence (Papathanasiou et al. 2014, Khomeiran et al. 2006) and this correlates with the findings presented in this thesis, which indicated that the participants were taking professional responsibility for their future medication management role. This was evident when participants spoke about taking responsibility to create new learning.
opportunities for themselves and they indicated that they regularly engaged in self-directed study.

It was noteworthy, that participants expressed the view that theoretical and clinical instruction in undergraduate nursing programmes could only take them so far and they believed that a personal responsibility for learning was paramount. All participants commented on the concept of lifelong learning. Lifelong learning in nursing is defined as a dynamic process, both personal and professional, formal and informal and involves seeking and appreciating new worlds or ideas in order to gain a new perspective as well as questioning one's environment, knowledge, skills and interactions (Davis et al. 2014). Similar to work by Halttunen et al. (2014), findings reported in this thesis indicated that participants ascribed importance to their responsibility as lifelong learners. This was the fourth and final theme identified in this study. In the next section the limitations of this study are discussed.

5.5 Limitations of the study

This study contributes to current knowledge by exploring the perceptions of fourth year nursing students regarding their educational preparation in medication management. Despite the contribution of this study, the findings are limited by the small sample size. Although the small sample size is acceptable for an interpretative phenomenological study, the views and perceptions of those interviewed cannot claim to be representative of all nursing students.

Participants were from one educational setting, thus limiting the study further, albeit three programmes were represented – BSc Nursing (General), BSc Nursing
(Mental Health) and BSc Nursing (Intellectual Disability) which provided a broader perspective on the phenomenon in question.

Findings from this study provide a snapshot in time. To provide more representative views the study population would need to be expanded to include a larger sample size from more than one educational institute. Furthermore, the inclusion of perspectives from lectures, preceptors and other nursing staff would offer a broader viewpoint. In addition, a comparative study of perceptions of nursing students, post the internship would be helpful. This interpretative phenomenological study was a starting point but more work would be needed to facilitate a greater understanding of nursing students’ preparation in medication management.

5.6 Chapter summary

In this study, final year nursing students about to embark on their clinical internship shared perceptions of their educational preparation in medication management. For the most part, findings in this study support current literature regarding nursing students’ perceptions of their educational preparation. However this study does offer new knowledge, specific to medication management. This chapter discussed the study findings in relation to national and international literature. The discussion was presented under the four themes that emerged during data analysis; developing an understanding, embedding knowledge in practice, engaging in practice and accepting professional responsibility. The knowledge that emerged from this study will contribute to future educational initiatives which aim to enhance nursing students learning in the area of
medication management. In chapter six, a summary of the significant findings of
the study and recommendations based on the research findings are presented.
Chapter 6: Recommendations and conclusion
Chapter 6: Recommendations and conclusion

6.0 Introduction

Patient safety and medication safety are inherently linked (World Health Organisation 2011). Medication management by healthcare professionals is one area where patient safety can be protected and enhanced (Adhikari et al. 2014, Meechan et al. 2011). Medication management is multidisciplinary business that requires multidisciplinary management (Adhikari et al. 2014). However, considering that nurses are the largest group of the healthcare professional workforce, it is imperative that the nursing profession actively addresses medication safety (Hemingway et al. 2011, Sulosaari et al. 2010, Brady et al. 2009). There are inherent links between nurses’ undergraduate educational preparation in medication management and patient safety (World Health Organisation 2011). Therefore, this study aimed to explore fourth year nursing students’ educational preparation in medication management from an Irish perspective. This chapter will summarise the significant findings of the study and present recommendations based on the research findings.

6.1 Significant findings of the study

Fourth year nursing students in this study had limited understandings of medication management. They were developing their knowledge, attitudes and skills to include wider interpretations of medication management rather than one-dimensional task orientated views. Findings indicated that nursing students had
specific concerns about medication administration and that they were unprepared for this aspect of medication management in the clinical learning environment.

An essential element for nursing students in developing knowledge was the structured learning regarding medication management that occurred in the university setting, particularly the pharmacology module. Findings suggested that nursing students had divergent views as to the helpfulness of this module with regard to its structure, delivery and content. However, despite divergent views, there was consensus that opportunities to integrate pharmacology knowledge with nursing practice were integral to their education in this area.

In this study participants positively viewed their clinical placements in the clinical learning environments and in relation to medication management they considered them fundamental for embedding knowledge in practice. Participants placed more emphasis on their learning in the clinical learning environment than on learning in the higher education institution as experiential learning in practice was perceived as an irreplaceable aspect of nursing education.

Findings from this study indicated that nursing students used technology enhanced information sources in the clinical learning environment in an attempt to link theory and practice. However, nursing students did not assess the provenance of technology enhanced information sources to assess their trustworthiness, authenticity or credibility. Furthermore, a permissible culture towards the use of technology for providing reliable evidence-based information sources in the clinical learning environment was not evident and this hindered participants’ ability to link theory and practice.
Current literature recognises the importance of a supportive clinical learning environment for students with regard to preceptorship (Sundler et al. 2014, Kristofferzon et al. 2013). In this study, participants reported both positive and negative experiences with preceptors and this affected their ability to link theory and practice. This study found that if a culture of positive preceptorship is nurtured by the person in charge e.g. clinical nurse manager, then this affected the approach to preceptorship in that area which led to a more positive experience for nursing students. Members of the multidisciplinary team, such as pharmacists and doctors, were also seen as positive supports for nursing students with regard to learning in medication management. Peer support between nursing students was also happening and was perceived as positive. It was noteworthy in this study, that participants expressed the view that learning in medication management occurred by listening to patients stories. This source of learning has not been identified in previous studies.

This study highlighted several issues in the clinical learning environment that had a significant impact on participants’ ability to engage in practice. These included a perceived lack of quality learning opportunities. This was related to factors such as the location and duration of the clinical placement. Missed learning opportunities were reported and were attributed to the attitude of the preceptor and/or to the busyness of the environment. Learning frameworks (such as competency assessment portfolios and clinical skills books) were perceived as unsupportive due to a perceived lack of supervision and feedback. A majority of
participants expressed a desire for a specific medication management assessment framework in the clinical learning environment.

A process of professional socialisation and role transition had begun for participants in this study. Participants needed feedback about their progress and needed reassurance about what would be expected of them in their new roles. It was noteworthy, that participants accepted a personal responsibility for learning and recognised that the clinical internship was not the end of their learning journey in medication management. Positive views about responsibility, motivation, initiative, self-directed learning and lifelong learning were evident.

6.2 Recommendations

Based on the findings of this study and supporting previous literature, the following recommendation for education, practice and research are suggested.

6.2.1 Education

Medication administration is just one aspect of medication management. However, in light of findings that nursing students feel unprepared and anxious about this task, perhaps greater emphasis might be placed on simulated medication administration. It is recommended that workshops or classes in the clinical skills laboratories would help prepare students for this multifaceted task in the clinical learning environment.

When developing and evaluating outcomes of undergraduate curricula, nurse educators need to consider the perceptions of undergraduate nursing students with regard to their educational preparation in medication management. While acknowledging that students expressed divergent views about module delivery
and content, nonetheless consideration of these viewpoints is recommended. As nursing is a practice based profession, teaching, learning and assessment strategies that promote integration and narrow the theory practice gap are favourable. It is recommended that case studies should be considered as an effective approach to teaching, learning and assessment in medication management education.

Medication management is a multidisciplinary process. Findings in this study suggested that nursing students are supported in their learning by members of the multidisciplinary team. Therefore, it is recommended that shared learning and collaborative approaches to multidisciplinary teaching and learning of medication management in higher education institutions should be encouraged. Furthermore, shared learning sessions in the clinical learning environment would assist students in the application of theory to practice. This multidisciplinary approach to learning would have benefits for all professions involved and would broaden students understanding of the different contributions that different professional make to medication management.

Final year nursing students are in role transition during the clinical internship. This is a stressful time for students and they need to know what is expected of them in relation to their upcoming role in medication management. Nurse educators are suitably placed to support students during this transition from supernumerary nursing student to intern on a clinical internship. In Ireland, protected reflective time is an integral aspect of undergraduate nursing programmes. It is recommended that aspects of medication management could be a focus within protected reflective time. This would enhance students’
understandings of the expectations of them regarding a medication management role during the clinical internship.

6.2.2 Practice

In this study participants positively viewed their clinical placements in the clinical learning environments. In relation to medication management, clinical placements were considered fundamental for embedding knowledge in practice. Nursing is a practice based profession and practice in the clinical learning environment is an essential component of undergraduate nursing education. Participants placed more emphasis on their learning in the clinical learning environment than on learning in the higher education institution as experiential learning was perceived as an irreplaceable aspect of nursing education. It is recommended that decision makers acknowledge nursing students’ perceptions regarding their clinical placements in a time where clinical learning environments are becoming harder to source and replacing them with alternatives is a potential reality.

This study reported that nursing students used technology enhanced information sources to link theory and practice in the clinical learning environment. Their ability to assess the provenance of such sources needs further exploration. Nurse educators and clinical nurse managers could provide more training and practice in this area. A permissible, supportive climate towards the use of technology enhanced information sources by nursing students in the clinical learning environment is recommended. Perhaps it is timely to provide and promote access to the web 2.0 technologies for nursing students. It is recommended that the use of approved technology enhanced medication management information sources via portable technological devices would enhance nursing students’ ability to embed
knowledge in practice. This would also be of benefit to the wider multidisciplinary team and it would ultimately enhance patient safety by ensuring that healthcare professionals have access to reliable evidence based information.

Educational institutions and their allied healthcare partners need to collaborate to ensure a welcoming permissive clinical learning environment for nursing students. To maximise meaningful learning opportunities, it is recommended that a positive learning culture in the clinical learning environment must be nurtured, ensuring sufficient exposure to various aspects of medication management, for example student participation in medication administration rounds.

Learning frameworks in the clinical learning environment need robust monitoring and feedback systems, without this they are meaningless. It is recommended that distinct learning frameworks with robust monitoring and feedback systems are implemented in the clinical learning environment to support nursing students learning in medication management. Furthermore, it is recommended that higher education institutions and their allied healthcare partners could collaborate to develop practice-based medication management training with specific learning outcomes for transitioning nursing students during the clinical internship.

6.2.3 Research

Embarking on a clinical internship is a stressful time for nursing students, particularly in relation to medication management. There is little research about role transition from supernumerary nursing student to nursing student in the clinical internship. Considering it is a major change, it is recommended that
further research would enhance understanding of this role transition and add knowledge on how best to support nursing students during this time.

It is recommended that further research addressing the views of key stakeholders in nursing education (lecturers, preceptors and nursing staff) would offer a broader viewpoint and facilitate greater understanding regarding nursing students’ educational preparation in medication management.

Further research is warranted on the prevalence, the positives and the negatives of peer support amongst nursing students in the clinical learning environment. It is recommended that research regarding peer support amongst nursing students in relation to learning medication management in the clinical learning environment should be explored.

The concept of patients as educators in the area of medication management was identified in this study. This concept warrants further exploration and it is recommended that research exploring the potential contributions of patients as educators in undergraduate nurse education should be explored, particularly contributions from patient advocacy groups. Patients’ perceptions of their role in supporting nursing students learning also warrants further investigation.

6.3 Chapter summary

Today’s students are tomorrow’s nurses and it is on this premise that this study was conducted. This interpretative phenomenological research study explored the perceptions of fourth year nursing students regarding their educational preparation in medication management. Semi-structured interviews were conducted with
fourteen participants across three BSc Nursing programmes at the University of Limerick. Data analysis was facilitated by utilising Burnard’s (2011) method of thematic content analysis. Participants’ voices and interpretations provided important research findings which were presented in four themes; *developing an understanding*, *embedding knowledge in practice*, *engaging in practice* and *accepting professional responsibility*. These findings were discussed in relation to national and international literature and recommendations for practice, education and research were offered. Overall, this research highlighted the importance of both the higher education institution and the clinical learning environment in nursing students’ medication management education. There is a need for a collaborative developmental approach within this education that focuses on integrating medication management throughout the students learning across their four years and a need for leadership and support within the clinical learning environment in assuming a supportive role in the students’ educational process. It is hoped that findings from this study will contribute to nursing education in this area.
References
References


An Bord Altranais (2005) 'Requirements and standards for nurse registration education programmes'.

An Bord Altranais (2007) 'Guidance to Nurses and Midwives Regarding Ethical Conduct of Nursing and Midwifery Research',

An Bord Altranais (2007a) 'Guidance to Nurses and Midwives on Medication Management',

An Bord Altranais (2014) 'The code of professional conduct for each nurse and midwife',


146


Fouka, G. and Mantzorou, M. (2011) 'What are the major ethical issues in conducting research? Is there a conflict between the research ethics and the nature of nursing?', *Health Science Journal*, 5(1).


Houghton, C. E. (2014) "'Newcomer adaptation': a lens through which to understand how nursing students fit in with the real world of practice', *Journal of Clinical Nursing*, 23(15-16), 2367-2375.


Reid-Searl, K., Moxham, L., Walker, S. and Happell, B. (2009) 'Internal conflict: Undergraduate nursing students’ response to inadequate supervision during the administration of medication', *Collegian*, 16(2), 71-77.


Richards, H. M. and Schwartz, L. J. (2002) 'Ethics of qualitative research: are there special issues for health services research?', *Family Practice*, 19(2).


Appendix A: Ethical approval
May 2013

Dear Owen, Liz, Mairead

Thank you for your amended Research Ethics application which was recently reviewed by the Education and Health Sciences Research Ethics Committee. The recommendation of the Committee is outlined below:

**Project Title:** 2013_05_05_EHS A Qualitative Study exploring 4th Year Nursing Students Perceptions of their Educational Preparation in Medication Management.
**Principal Investigator:** Owen Doody
**Other Investigators:** Liz Kingston, Mairead Moloney.
**Recommendation:** Approved until November 2014

Please note that as Principal Investigator of this project you are required to submit a Research Completion Report Form on completion of this research study.

Yours Sincerely

__________________________________________________________________________

Dr. Barry Coughlan  
Snr. Lecturer & Assistant Director  
Doctoral Programme in Clinical Psychology  
Chair, Education and Health Sciences Research Ethics Committee  
University of Limerick.  
Tel: xxxxxxxxxxxx  
Mobile: xxxxxxx  
Barry.Coughlan@ul.ie
Appendix B: Recruitment letter/email
Recruitment Letter/Email

Researchers name,
Researchers Address,
Tel: xxx xxxxxx
Email: xxxx@ul.ie

19th April 2013

Research Study: 4th Year Nursing Students’ Perceptions of their Preparation in Medication Management

Dear [Student name],

My name is Mairead Moloney and I’m writing to you to ask if you would agree to become involved in a study I’m about to conduct. I aim to investigate 4th year nursing students’ perceptions of their educational preparation in medication management. This area of study is of great importance as medication management is an important aspect of patient safety and many student nurses report gaps in their educational preparation for this role, for this reason I would like to study your perceptions regarding this topic. I feel this study will be of benefit in highlighting current students’ perceptions and go
some way to enhancing future nursing students’ educational preparation in this
area.

For this study to take place I will be looking for 4th year student nurses who
feel they would like to contribute to the study. I hope you agree to take part in
the study and if so would you please return the enclosed reply slip, which
indicates your interest to participate in the study, you can use the stamped
addressed envelope enclosed or email the reply slip to me at the email address
above. On receipt of the reply slip I will contact you to further explain the
study and answer any questions that you may have. This study will be
conducted through interviews conducted by myself. The interview will be
audio-recorded and will take approximately 40-60 minutes. Participation in the
project is voluntary and confidential; your anonymity will be protected and
maintained at all times. If you decide to respond it is important that you are
aware that you can withdraw from the study at any time if you so wish.

I would be grateful if you would consider my request and return the reply slip
so we can have a broader discussion of what is involved. Should you wish to
participate in the study you will not be expected to make any commitments that
will put any pressure on your daily life and it would be my responsibility to
organise my schedule to facilitate a time and location for the interview that
suits you. Thank you for your time and I look forward to hearing from you.

Yours Sincerely,

Mairead Moloney.
Appendix C: Participant information sheet
Appendix C: Participant information sheet

Participant Information Sheet

Title of Study

4th Year Nursing Students’ Perceptions of their Preparation in Medication Management

EHS Approval number

2013_05_05_EHS

Aims of Study

The aim of this study is to explore the perceptions of 4th year nursing students regarding their educational preparation in medication management. To date, there are no such studies regarding students’ perceptions in this area of study in Ireland.
What will you have to do?

If you volunteer to take part in this study, you would be required to participate in a one-to-one interview with the researcher. This interview would last approximately forty to sixty minutes. The time and venue for the interview will be organised to facilitate you. This interview will be audio-recorded to assist the researcher in the data analysis stage.

What are the benefits for you?

There may not be a personal benefit to you if you choose to participate, however by highlighting your perceptions in this area, you will be contributing to the current body of knowledge and understanding of this topic area and thereby enhancing future nursing students’ educational preparation.

What are the risks to you?

While there are no anticipated risks to participants, it is acknowledged that all qualitative research has the potential to raise emotive response in people, especially when participants are drawing on past experiences. Your confidentiality and anonymity are safeguarded at all times.

What are the alternatives?

Participation in this research study is voluntary. If you decide to participate you can still withdraw from the study at any time or stage of the research if you so wish without penalty or disadvantage occurring.
Who is taking part?

4th year students on the undergraduate BSc nursing programmes in UL will be invited to participate on a voluntary basis.

What happens to the data?

If you volunteer to participate in this research study, your confidentiality and anonymity will be protected at all times. Your name will not be linked to your responses either in the research transcripts, research report or in any publications. Pseudo names will be used at all times and in the presentation of findings and masking will be used in verbatim statements to hide verbal mannerisms or figures of speech which might identify a participant. The findings from the study will be presented in the researchers’ final MSc thesis, which will be held in the UL library. On completion of the study, the researcher will forward a summary of the research findings to each participant. All data gathered during the interview will be stored securely by the researcher. Only the researchers named below will have access to the data. All data will be destroyed after a seven year timeframe.

Name and contact details of the researchers

Mairead Moloney,
MSc Student,
Department of Nursing and Midwifery, UL,
Email: xxxxxxxxxxxx Tel: xxx-xxxxxx
Dr Owen Doody,
Lecturer / Research Supervisor
Department of Nursing and Midwifery, UL,
Email: xxxxxxxxxxxx Tel: xxx-xxxx.

Ms Liz Kingston
Senior CSL Coordinator / Research Supervisor,
Department of Nursing and Midwifery, UL,
Email: xxxxxxxxxxxx Tel: xxx-xxxx

Concerns

This research study has received Ethics approval from the Education and Health Sciences Research Ethics Committee (2013_05_05_EHS). If you have any concerns about this study and wish to contact someone independent you may contact:

Chairman Education and Health Sciences Research Ethics Committee
EHS Faculty Office
University of Limerick
Tel (061) 234101
Email: ehsresearchethics@ul.ie
Reply Slip

Research Study: 4th Year Nursing Students’ Perceptions of their Education Preparation in Medication Management

I am interested in your research study and I would like to find out more about what is involved. My contact details are (please give details of whatever means of communication is most suitable and preferable to you).

Name:

Preferred means of contact:

My preferred times of contact are:
All correspondence can be sent to this address:

________________________________________________________
________________________________________________________
________________________________________________________

Please return this form to Mairead Moloney via email or post using the stamped addressed envelope provided:

Email: xxxxxxxxxxxxxx Tel: xxx-xxxxxx

Post: Mairead Moloney, Department of Nursing and Midwifery, Health Sciences Building, University of Limerick, Limerick.
Appendix D: Informed consent form
Appendix D: Informed consent form

Informed Consent Form

Title of Study

4th Year Nursing Students’ Perceptions of their Educational Preparation in Medication Management

EHSREC approval number:

2013_05_05_EHS

Invitation to take part in a Research Study

You are invited to take part in a research study to explore 4th year nursing students’ perceptions of their educational preparation in medication management. If you agree to take part, you would be required to take part in a one-to-one semi-structured interview, lasting approximately 40 to 60 minutes.

Purpose of the Research Study

The purpose of this research study is to explore 4th year nursing students’ perceptions of their educational preparation in medication management. By consenting to take part and by highlighting your perceptions in this area, you
will be contributing to the current body of knowledge and understanding of this topic area and thereby enhancing future nursing students’ educational preparation.

**Before you begin the study it is important that you understand the following points:**

- Your participation is voluntary and you may withdraw from the research at any time for any reason.
- Your confidentiality and anonymity are assured by the researcher.
- Your name or any information that might identify you will not be linked to your responses either in the research transcripts, research report or in any publications.
- You may omit questions that you do not want to answer.
- On completion of the study, you will receive a summary of the findings.

By signing below you are agreeing that you have read and understand the Participant Information Sheet and that you agree to take part in this research study.

________________________________  ___________
Participant’s signature    Date

_________________________________  _____________
Signature of person obtaining consent Date
Appendix E: Interview guide
Appendix E: Interview guide

Interview Guide

Research Title: 4th Year Nursing Students’ Perceptions of their Preparation in Medication Management

Researchers Name: Mairead Moloney, MSc Student
Email: xxxxxx
Tel: xxxxxx

Research Supervisor: Dr Owen Doody
Email: xxxxxx
Tel: xxxxxx

Research Supervisor: Liz Kingston
Email: xxxxxx
Tel: xxxxxx
General conversation used to commence the interview

Welcome and thank you for volunteering to meet with me, how is 4th year going?

Introduction to the Interview

I invited you here today to talk about your perceptions of your educational preparation in medication management. Your educational preparation involves you’re learning in the university setting and you’re learning in clinical practice. I want to emphasise that there are no right or wrong answers and what’s important is your perceptions. My role is to facilitate the interview and I do have some questions that I would like you to consider.

Questions from here on in will focus on the students’ perception of his or her educational preparation in medication management

Questions about the students’ perceptions of their educational preparation during their time on clinical practice

- From your experience to date, what do you consider to be medication management activities?
- In your role as a student nurse, have you been involved in such activities?
- You will be commencing your internship soon – how do you feel about your upcoming medication management role?
Questions about the students’ perceptions of their educational preparation during their time in the university

- How do you feel your undergraduate education prepared you for this role?
  - What aspects do you feel supported you?
  - Are there aspects you feel hindered you?
- Is there anything else you would like to add or ask?

Based on the participants’ responses, I will use probing questions to try and elicit a deeper understanding of their responses.
Appendix F: Data analysis
Appendix F: Data analysis

Burnard’s (2011) thematic content analysis

**Stage One:** Reflective diary entries were made after each interview. The interviews were transcribed verbatim by the researcher. Each participant was given a number and each response was numbered.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 = Participant 1</td>
<td>P1-1 = Participant 1, response 1</td>
</tr>
<tr>
<td>P2 = Participant 2</td>
<td>P2-1 = Participant 2, response 1</td>
</tr>
<tr>
<td>P3 = Participant 3</td>
<td>P3-1 = Participant 3, response 1</td>
</tr>
<tr>
<td>P4 = Participant 4</td>
<td>P4-1 = Participant 4, response 1</td>
</tr>
<tr>
<td>P5 = Participant 5</td>
<td>P5-1 = Participant 5, response 1</td>
</tr>
<tr>
<td>P6 = Participant 6</td>
<td>P6-1 = Participant 6, response 1</td>
</tr>
<tr>
<td>P7 = Participant 7</td>
<td>P7-1 = Participant 7, response 1</td>
</tr>
<tr>
<td>P8 = Participant 8</td>
<td>P8-1 = Participant 8, response 1</td>
</tr>
<tr>
<td>P9 = Participant 9</td>
<td>P9-1 = Participant 9, response 1</td>
</tr>
<tr>
<td>P10 = Participant 10</td>
<td>P10-1 = Participant 10, response 1</td>
</tr>
<tr>
<td>P11 = Participant 11</td>
<td>P11-1 = Participant 11, response 1</td>
</tr>
<tr>
<td>P12 = Participant 12</td>
<td>P12-1 = Participant 12, response 1</td>
</tr>
<tr>
<td>P13 = Participant 13</td>
<td>P13-1 = Participant 13, response 1</td>
</tr>
<tr>
<td>P14 = Participant 14</td>
<td>P14-1 = Participant 14, response 1</td>
</tr>
</tbody>
</table>
**Stage Two:** The transcripts were read and re-read until the researcher felt immersed in the data.

**Stage Three:** The transcripts were read and re-read again. Open coding began. Reduction of text was carefully applied and as a result one hundred and thirty three category codes were recorded.

**Stage Four:** The category codes were analysed and similar category codes were collapsed into higher order category codes. This resulted in nine higher order category codes.

**Stage Five:** Researcher returned to the original transcripts with the final list of subthemes / higher order category codes. The researcher worked through the original transcripts matching sections of text to the corresponding subtheme, until there was no text left. The text of interview transcripts were colour coded until all text was accounted for. Each colour represented a subtheme. The end result meant that all quotations related to specific subthemes were recorded in a manageable, easily accessible way.

**Stage Six:** Four themes / final category codes emerged from the organised data. These themes provided the basis for the subsequent findings and discussion chapters.
<table>
<thead>
<tr>
<th><strong>Theme / Final category codes</strong></th>
<th><strong>Subtheme / Higher order category codes</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing an understanding</td>
<td>The meaning of medication management.</td>
</tr>
<tr>
<td></td>
<td>Wider issues in medication management.</td>
</tr>
<tr>
<td>Embedding knowledge in practice</td>
<td>The pharmacology module.</td>
</tr>
<tr>
<td></td>
<td>Clinical placement.</td>
</tr>
<tr>
<td></td>
<td>Technology enhanced information source.</td>
</tr>
<tr>
<td>Engaging in practice</td>
<td>Preceptorship and support.</td>
</tr>
<tr>
<td></td>
<td>Clinical learning environment.</td>
</tr>
<tr>
<td>Accepting professional responsibility</td>
<td>Future medication management role.</td>
</tr>
<tr>
<td></td>
<td>Responsibility for own learning.</td>
</tr>
<tr>
<td>Subtheme / Higher order category codes</td>
<td>Category codes</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>The meaning of medication management.</td>
<td>Administration</td>
</tr>
<tr>
<td></td>
<td>Documentation</td>
</tr>
<tr>
<td></td>
<td>Stocking</td>
</tr>
<tr>
<td></td>
<td>IM/IV</td>
</tr>
<tr>
<td></td>
<td>Double checking</td>
</tr>
<tr>
<td></td>
<td>Observation</td>
</tr>
<tr>
<td></td>
<td>Side effects</td>
</tr>
<tr>
<td></td>
<td>History taking</td>
</tr>
<tr>
<td></td>
<td>The five ‘R’s</td>
</tr>
<tr>
<td>Wider issues in medication management.</td>
<td>Responsibility</td>
</tr>
<tr>
<td></td>
<td>Sharps</td>
</tr>
<tr>
<td></td>
<td>Hand Hygiene</td>
</tr>
<tr>
<td></td>
<td>Multidisciplinary</td>
</tr>
<tr>
<td></td>
<td>Varied</td>
</tr>
<tr>
<td></td>
<td>Restricted drugs</td>
</tr>
<tr>
<td></td>
<td>Pain management</td>
</tr>
<tr>
<td></td>
<td>Nutrition</td>
</tr>
<tr>
<td></td>
<td>Patient support</td>
</tr>
<tr>
<td></td>
<td>Patient education</td>
</tr>
<tr>
<td></td>
<td>Patient safety</td>
</tr>
<tr>
<td></td>
<td>Nurses’ role</td>
</tr>
<tr>
<td></td>
<td>Nurses’ role is changing</td>
</tr>
<tr>
<td></td>
<td>Scope of practice</td>
</tr>
<tr>
<td></td>
<td>Aging population</td>
</tr>
<tr>
<td>The pharmacology module.</td>
<td>Pharmacology is hard</td>
</tr>
<tr>
<td></td>
<td>The pharmacology module is good</td>
</tr>
<tr>
<td></td>
<td>The pharmacology module is not good</td>
</tr>
<tr>
<td></td>
<td>The lecturer</td>
</tr>
<tr>
<td></td>
<td>The content</td>
</tr>
<tr>
<td></td>
<td>Labs are good</td>
</tr>
<tr>
<td></td>
<td>Labs are practical learning</td>
</tr>
<tr>
<td></td>
<td>Labs for linking</td>
</tr>
<tr>
<td></td>
<td>Labs are a good learning environment</td>
</tr>
<tr>
<td></td>
<td>Labs could be better</td>
</tr>
<tr>
<td></td>
<td>Lab simulation</td>
</tr>
<tr>
<td></td>
<td>Classroom setting</td>
</tr>
<tr>
<td></td>
<td>Timing of pharmacology module</td>
</tr>
<tr>
<td></td>
<td>Pharmacology throughout the programme</td>
</tr>
<tr>
<td></td>
<td>Psych module</td>
</tr>
<tr>
<td></td>
<td>Pharmacology exam</td>
</tr>
<tr>
<td></td>
<td>Case studies</td>
</tr>
<tr>
<td></td>
<td>More assessment/assignments</td>
</tr>
<tr>
<td>More feedback</td>
<td>Learning styles</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clinical placement.</th>
<th>Value of placement</th>
<th>Love placement</th>
<th>Importance of placement</th>
<th>Remembering patients</th>
<th>Remembering placement</th>
<th>Remembering good experiences</th>
<th>Linking it</th>
<th>Interlinking</th>
<th>Relating it</th>
<th>Picturing it</th>
<th>Making sense of it</th>
<th>Fulfilling your learning</th>
<th>All coming together</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Technology enhanced information source.</th>
<th>Patient information pamphlets</th>
<th>Ward information</th>
<th>Manufacturers’ information</th>
<th>BNF &amp; MIMS</th>
<th>Google</th>
<th>Patient medical notes</th>
<th>Technology enhanced information source</th>
<th>IPhones</th>
<th>Ipad</th>
<th>Ward internet</th>
<th>Internet at home</th>
<th>Accessibility of info</th>
<th>Availability of info</th>
<th>Regularly updated info</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Preceptorship and support.</th>
<th>Depends on the nurse</th>
<th>Supervision</th>
<th>Positive preceptorship</th>
<th>Negative preceptorship</th>
<th>Preceptor fear</th>
<th>Communication</th>
<th>Guidance</th>
<th>Support from CNS</th>
<th>Support from CPC</th>
<th>Support from MDT</th>
<th>Support from pharmacist</th>
<th>Support from doctor</th>
<th>Support from newly qualified nurses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support from CNM</td>
<td>Length of time on placement / familiarity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support from other students</td>
<td>Opportunities on placement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support from patients</td>
<td>Opportunities - having an excuse</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Being given an opportunity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Missed opportunities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Opportunities on quieter placements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not being included</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Making opportunities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Blaming oneself for missed opportunities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical learning environment.</td>
<td>Good Placements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Difference in placements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Competence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Needs on placement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medication portfolio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Using the competency as an excuse</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clinical skills book</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Busy ward</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Busy nurse</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hard for the nurse</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Future medication management role.</th>
<th>Cautious</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assertiveness</td>
</tr>
<tr>
<td></td>
<td>Anxiety</td>
</tr>
<tr>
<td></td>
<td>Anticipation</td>
</tr>
<tr>
<td></td>
<td>Confidence</td>
</tr>
<tr>
<td></td>
<td>Apprehensive</td>
</tr>
<tr>
<td></td>
<td>Afraid of being arrogant</td>
</tr>
<tr>
<td></td>
<td>Avoiding</td>
</tr>
<tr>
<td></td>
<td>Excited</td>
</tr>
<tr>
<td></td>
<td>Fun</td>
</tr>
<tr>
<td></td>
<td>Daunting</td>
</tr>
<tr>
<td></td>
<td>Afraid</td>
</tr>
<tr>
<td></td>
<td>Scary</td>
</tr>
<tr>
<td></td>
<td>Fear</td>
</tr>
<tr>
<td></td>
<td>Nervous</td>
</tr>
<tr>
<td></td>
<td>Hesitant</td>
</tr>
<tr>
<td></td>
<td>Expectations</td>
</tr>
<tr>
<td></td>
<td>Confusion about the internship role</td>
</tr>
<tr>
<td></td>
<td>Inexperience</td>
</tr>
<tr>
<td></td>
<td>Getting ready</td>
</tr>
<tr>
<td></td>
<td>Getting judged</td>
</tr>
<tr>
<td></td>
<td>Preparation for internship</td>
</tr>
<tr>
<td></td>
<td>Expectations of interns</td>
</tr>
<tr>
<td>Pre internship</td>
<td>Clinical internship</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Not wanting to make mistakes</td>
<td>Comparing each other</td>
</tr>
<tr>
<td>Questioning oneself</td>
<td>Being part of the team</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Responsibility for own learning.</th>
<th>Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wanting to learn</td>
<td>Wanting to learn</td>
</tr>
<tr>
<td>Lifelong learning</td>
<td>Lifelong learning</td>
</tr>
<tr>
<td>Curiosity</td>
<td>Curiosity</td>
</tr>
<tr>
<td>Initiative</td>
<td>Initiative</td>
</tr>
<tr>
<td>Reflection</td>
<td>Reflection</td>
</tr>
<tr>
<td>Unexpected</td>
<td>Unexpected</td>
</tr>
<tr>
<td>Responsibility for own learning</td>
<td>Responsibility for own learning</td>
</tr>
<tr>
<td>Self-directed learning</td>
<td>Self-directed learning</td>
</tr>
<tr>
<td>Pushing oneself</td>
<td>Pushing oneself</td>
</tr>
</tbody>
</table>
Appendix G: Published papers in literature review
### Appendix G – Published papers included in literature review

<table>
<thead>
<tr>
<th>Authors</th>
<th>Date</th>
<th>Paper Title</th>
<th>Journal</th>
<th>Approach</th>
<th>Major Findings</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggar, C. and Dawson, S.</td>
<td>2014</td>
<td>Evaluation of student nurses' perception of preparedness for oral medication administration in clinical practice: A collaborative study</td>
<td>Nurse Education Today</td>
<td>Quantitative: questionnaire survey of nursing students (n=88) from two educational institutions.</td>
<td>Low fidelity simulated teaching environments may improve nursing students’ perceived preparedness for oral medication administration. Simulated environments should be in addition to, and not instead of the real life clinical learning environment.</td>
<td>Australia</td>
</tr>
<tr>
<td>Authors</td>
<td>Date</td>
<td>Paper Title</td>
<td>Journal</td>
<td>Approach</td>
<td>Major Findings</td>
<td>Country</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
<td>-------------</td>
<td>---------</td>
<td>----------</td>
<td>----------------</td>
<td>---------</td>
</tr>
<tr>
<td>Adhikari, R., Tocher, J., Smith, P., Corcoran, J. and MacArthur, J.</td>
<td>2014</td>
<td>A multi-disciplinary approach to medication safety and the implication for nursing education and practice</td>
<td>Nurse Education Today</td>
<td>Mixed methods: Action Research project - ethnography-style observational method, seven in-depth interviews with nursing staff, informal discussions with healthcare professionals, two focus-groups, one peer-interview and two in-depth individual interviews with final year nursing students from three Higher Education Institutions</td>
<td>There is a need for strengthened multi-disciplinary team-work to achieve greater patient safety. Nurses working in clinical settings need continuing professional development opportunities.</td>
<td>Scotland</td>
</tr>
<tr>
<td>Authors</td>
<td>Date</td>
<td>Paper Title</td>
<td>Journal</td>
<td>Approach</td>
<td>Major Findings</td>
<td>Country</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------------------------</td>
<td>------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Cleary-Holdforth, J. and Leufer, T.</td>
<td>2013</td>
<td>The strategic role of education in the prevention of medication errors in nursing: Part 2</td>
<td>Nurse Eduaction in Practice</td>
<td>Discussion paper</td>
<td>Education in both academic and clinical settings plays a significant role in the preparation of nurses for their roles in medication management. A collaborative approach, when applied to medication management, has the potential to greatly enhance patient safety and care delivery</td>
<td>Ireland</td>
</tr>
<tr>
<td>Sulosaari, V., Huupponen, R., Torniainen, K., Hupli, M., Puukka, P. and Leino-Kilpi, H.</td>
<td>2013</td>
<td>Medication education in nursing programmes in Finland – Findings from a national survey</td>
<td>Collegian</td>
<td>Quantitative: Questionnaires were used to collect data from programme managers responsible for curriculum (n=22) and from teachers involved with medication education (n=136)</td>
<td>There were variations between nursing programmes regarding the content and time devoted to pharmacology</td>
<td>Finland</td>
</tr>
<tr>
<td>Authors</td>
<td>Date</td>
<td>Paper Title</td>
<td>Journal</td>
<td>Approach</td>
<td>Major Findings</td>
<td>Country</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>------</td>
<td>---------------------------------------------------------------</td>
<td>------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Fleming, S., Brady, A.-M. and Malone, A.-M.</td>
<td>2014</td>
<td>An evaluation of the drug calculation skills of registered nurses</td>
<td>Nurse Education in Practice</td>
<td>Quantitative: A cross sectional survey (questionnaire and medication calculation test) of registered nurses (n=228) at five major academic teaching hospitals</td>
<td>There were inconsistencies in the amount of pharmacology within nursing curricula. Participants perceived practical experience as the most common way in which they learned about medication calculations. The most frequent type of calculation errors were attributed to conceptual errors rather than maths skills.</td>
<td>Ireland</td>
</tr>
<tr>
<td>Reid-Searl, K., Happell, B., Burke, K. J. and Gaskin, C. J.</td>
<td>2013</td>
<td>Nursing students and the supervision of medication administration'</td>
<td>Collegian</td>
<td>Quantitative: survey of nursing students’ (n=45) experiences of supervision</td>
<td>Nursing students are not always adequately supervised in relation to medication management.</td>
<td>Australia</td>
</tr>
<tr>
<td>Authors</td>
<td>Date</td>
<td>Paper Title</td>
<td>Journal</td>
<td>Approach</td>
<td>Major Findings</td>
<td>Country</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------</td>
<td>------------------------------------------------------------------------------</td>
<td>--------------------------</td>
<td>---------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Sulosaari, V., Kajander, S., Hupli, M., huupponem, R. and LeinoKilpi, H.</td>
<td>2012</td>
<td>Nurse students' medication competence - An integrative review of the associated factors</td>
<td>Nurse Education Today</td>
<td>Integrative literature review</td>
<td>The focus in medication competence research has been on nurse students' medication calculation skills. Attention needs to be paid to other competency areas such as medication administration and patient medication education skills. A limited amount of research exists that explores what factors are associated with medication competence</td>
<td>Finland</td>
</tr>
<tr>
<td>Authors</td>
<td>Date</td>
<td>Paper Title</td>
<td>Journal</td>
<td>Approach</td>
<td>Major Findings</td>
<td>Country</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Dilles, T., Vander Stichele, R. R., Van Bortel, L. and Elseviers, M. M.</td>
<td>2011</td>
<td>Nursing students' pharmacological knowledge and calculation skills: Ready for practice?</td>
<td>Nurse Education Today</td>
<td>Quantitative: cross-sectional survey using a ‘medication knowledge and calculations test’ to nursing students (n=613) across thirty-eight nursing schools</td>
<td>Results indicated a large divergence in pharmacology education organisation between schools. Nursing students’ pharmacological knowledge was limited and was not adequate for the delivery of safe medication care.</td>
<td>Belgium</td>
</tr>
<tr>
<td>Hemingway, S., Baxter, H., Smith, G., Burgess-Dawson, R. &amp; Dewhirst, K.</td>
<td>2011</td>
<td>Collaboratively planning for medication administration competency: a survey evaluation</td>
<td>Journal of Nursing Management</td>
<td>Quantitative: short answer questionnaire to nursing students (n=120).</td>
<td>Students exposed to an integrated curriculum were better able to apply pharmacological knowledge than the control group. Early introduction of an integrated approach to the teaching and assessing of pharmacological processes improves students’ knowledge.</td>
<td>UK</td>
</tr>
<tr>
<td>Authors</td>
<td>Date</td>
<td>Paper Title</td>
<td>Journal</td>
<td>Approach</td>
<td>Major Findings</td>
<td>Country</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Reid-Searl, K., Moxham, L., Walker, S. and Happell, B.</td>
<td>2010</td>
<td>Supervising medication administration by undergraduate nursing students: influencing factors</td>
<td>Journal of Clinical Nursing</td>
<td>Qualitative: grounded theory approach, in-debt semi-structured interviews with final year undergraduate nursing students (n=28).</td>
<td>The quality of supervision students received in medication management was related to the attitudes of supervisors, the expectations they had of final-year students, and the educational background of the supervisor.</td>
<td>Australia</td>
</tr>
<tr>
<td>Ndosi, M. and Newell, R.</td>
<td>2010</td>
<td>Medicine information sources used by nurses at the point of care</td>
<td>Journal of Clinical Nursing</td>
<td>Quantitative: cross sectional survey of forty-two nurses</td>
<td>Participants received the greatest part of their pharmacology knowledge in the clinical learning environment. Meaningful learning opportunities related to medication management do not occur without structured learning supports in the clinical learning environment.</td>
<td>UK</td>
</tr>
<tr>
<td>Authors</td>
<td>Date</td>
<td>Paper Title</td>
<td>Journal</td>
<td>Approach</td>
<td>Major Findings</td>
<td>Country</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------</td>
<td>------------------------------------------------------------------------------</td>
<td>-------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Reid-Searl, K., Moxham, L., Walker, S. and Happell, B.</td>
<td>2009</td>
<td>Internal conflict: Undergraduate nursing students’ response to inadequate supervision during the administration of medication</td>
<td>Collegian</td>
<td>Qualitative: grounded theory approach, semi-structured interviews with undergraduate nursing students (n=28).</td>
<td>Divergent requirements and expectations between the university and the clinical learning environment created internal conflict and stress for students. This often resulted in nursing students participating in risky behaviour which compromised patient safety.</td>
<td>Australia</td>
</tr>
<tr>
<td>Reid-Searl, K., Moxham, L., Walker, S. and Happell, B.</td>
<td>2008</td>
<td>Shifting supervision: implications for safe administration of medication by nursing students</td>
<td>Journal of Clinical Nursing</td>
<td>Qualitative: grounded theory approach, semi-structured interviews with twenty-eight final year undergraduate nursing students</td>
<td>Quality learning experiences for students in the clinical learning environment are dependent on high quality supervision. Undergraduate nursing students were involved in medication errors and ‘near misses’ and this was attributed to inadequate supervision of students.</td>
<td>Australia</td>
</tr>
<tr>
<td>Authors</td>
<td>Date</td>
<td>Paper Title</td>
<td>Journal</td>
<td>Approach</td>
<td>Major Findings</td>
<td>Country</td>
</tr>
<tr>
<td>------------------------</td>
<td>------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Honey, M. and Gigi Lim, A.</td>
<td>2008</td>
<td>Application of Pharmacology knowledge in medication management by final year undergraduate nursing students</td>
<td>Contemporary Nurse</td>
<td>Qualitative descriptive study - surveys (with two open ended questions) to final year undergraduate nursing students (n=60).</td>
<td>Respondents perceived a lack of confidence in their ability to apply pharmacology knowledge and felt unprepared for their roles in medication management. The majority of barriers to learning were linked to the clinical context</td>
<td>New Zealand</td>
</tr>
<tr>
<td>Ndosi, M. and Newell, R.</td>
<td>2008</td>
<td>Nurses' knowledge of pharmacology behind drugs they commonly administer</td>
<td>Journal of Clinical Nursing</td>
<td>Mixed methods: structured interviews and a questionnaire with nurses (n=42) in one hospital setting.</td>
<td>The majority of nurses had insufficient pharmacology knowledge and were unprepared for their medication management roles.</td>
<td>UK</td>
</tr>
<tr>
<td>Authors</td>
<td>Date</td>
<td>Paper Title</td>
<td>Journal</td>
<td>Approach</td>
<td>Major Findings</td>
<td>Country</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>------</td>
<td>----------------------------------------------------------</td>
<td>--------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Grandell-Niemi, H., Hupli, M., Leino-Kilpi, H. and Puukka, P.</td>
<td>2005</td>
<td>Finnish nurses' and nursing students' pharmacological skills</td>
<td>Journal of Clinical Nursing</td>
<td>Quantitative: Postal questionnaire and a medication calculation skills test. Respondents included registered nurses (n=364) from seven hospitals and graduating nursing students (n=282) from five educational institutions.</td>
<td>Nurses and students found pharmacology difficult. In relation to the MCS test, over half of nurses scored 79% or higher, which was considered adequate. However, nursing students did not perform as well, with over half achieving a mean score of 67%.</td>
<td>Finland</td>
</tr>
<tr>
<td>King, R. L.</td>
<td>2004</td>
<td>Nurses' perception of their pharmacology educational needs</td>
<td>Journal of Advanced Nursing</td>
<td>Qualitative: semi-structured interviews with ten nurses at one clinical setting.</td>
<td>Nurses were dissatisfied with their educational preparation in pharmacology and this was linked to a perceived lack of time, lack of structure and over-emphasis on other modules in undergraduate nursing curricula.</td>
<td>UK</td>
</tr>
<tr>
<td>Authors</td>
<td>Date</td>
<td>Paper Title</td>
<td>Journal</td>
<td>Approach</td>
<td>Major Findings</td>
<td>Country</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Manias, E., Aitken, R.</td>
<td>2004</td>
<td>Medication management by graduate nurses: Before, during and following medication administration</td>
<td>Nursing and Health Sciences</td>
<td>Qualitative: semi-structured interviews with graduate nurses (n=12).</td>
<td>Graduate nurses need ready access to experienced health care professionals. Through collegial support, graduate nurses should also be encouraged to critically examine the different possibilities when making clinical judgments about monitoring patient medications.</td>
<td>Australia</td>
</tr>
<tr>
<td>Manias, E. and Bullock, S.</td>
<td>2002a</td>
<td>The educational preparation of undergraduate nursing students in pharmacology: perceptions and experiences of lectures and students</td>
<td>International Journal of Nursing Studies</td>
<td>Qualitative: fourteen focus group interviews were conducted at ten different university settings in Australia. This involved focus group interviews with academic staff (n=16) and students (n=43).</td>
<td>Seven out of ten universities had integrated programmes of pharmacology. In the universities without a dedicated pharmacology module, very little emphasis was placed on pharmacological principles in integrated subjects.</td>
<td>Australia</td>
</tr>
<tr>
<td>Authors</td>
<td>Date</td>
<td>Paper Title</td>
<td>Journal</td>
<td>Approach</td>
<td>Major Findings</td>
<td>Country</td>
</tr>
<tr>
<td>----------------------</td>
<td>------</td>
<td>------------------------------------------------------------------------------</td>
<td>-----------------------------------------</td>
<td>-----------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Manias, E. and Bullock, S.</td>
<td>2002b</td>
<td>The educational preparation of undergraduate nursing students in pharmacology: clinical nurses' perceptions and experiences of graduate nurses' medication knowledge</td>
<td>International Journal of Nursing Studies</td>
<td>Qualitative: Six focus group interviews with clinical nurses (n=36) from four different hospitals</td>
<td>Nurses had deficits in their pharmacology knowledge. This was attributed to an unstructured approach to learning pharmacology at an undergraduate level and to an unstructured approach to addressing the continuing education needs of graduate nurses.</td>
<td>Australia</td>
</tr>
<tr>
<td>Bullock, S. and Manias, E.</td>
<td>2002</td>
<td>The educational preparation of undergraduate nursing students in pharmacology: a survey of lecturers' perceptions and experiences</td>
<td>Journal of Advanced Nursing</td>
<td>Quantitative: a survey of lecturers (n=78) in thirteen universities</td>
<td>Findings indicated variances between educational institutions with regard to the number of hours and the timing of the pharmacology component of programmes. There was dissatisfaction with the preparation of nursing students with respect to their pharmacology knowledge base.</td>
<td>Australia</td>
</tr>
<tr>
<td>Authors</td>
<td>Date</td>
<td>Paper Title</td>
<td>Journal</td>
<td>Approach</td>
<td>Major Findings</td>
<td>Country</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------------------------</td>
<td>-------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Morrison-Griffiths, S., Snowden, M. A. and</td>
<td>2002</td>
<td>Pre-registration nurse education in pharmacology: is it adequate for the roles</td>
<td>Nurse Education Today</td>
<td>Quantitative: surveyed fifty two educational institutions in the UK</td>
<td>It was highlighted that the teaching of pharmacology varied greatly between educational institutions and suggested that nursing students were inadequately prepared for a role in medication management.</td>
<td>UK</td>
</tr>
<tr>
<td>Pirmohamed, M.</td>
<td></td>
<td>that nurses are expected to fulfil?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latter, S., Rycroft-Malone, J., Yerrell, P.</td>
<td>2001</td>
<td>Nurses' educational preparation for a medication education role: findings</td>
<td>Nurse Education Today</td>
<td>Quantitative: A national survey of fifty</td>
<td>A national overview of curriculum design and delivery related factors of pharmacology within pre and post registration nursing education was provided. Findings highlighted a general dissatisfaction with pharmacology education in pre and post registration curricula.</td>
<td>UK</td>
</tr>
<tr>
<td>and Shaw, D.</td>
<td></td>
<td>from a national survey</td>
<td></td>
<td>one education institutions in the UK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Authors</td>
<td>Date</td>
<td>Paper Title</td>
<td>Journal</td>
<td>Approach</td>
<td>Major Findings</td>
<td>Country</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Latter, S., Rycroft-Malone, J., Yerrell, P. and Shaw, D.</td>
<td>2000</td>
<td>Evaluating educational preparation for a health education role in practice: the case for medication education</td>
<td>Journal of Advanced Nursing</td>
<td>Mixed methods: case study design research involved multiple methods of data collection at three educational institutions involving nursing students, lecturers and practitioners.</td>
<td>This study highlighted a lack of consistency and fundamental flaws in the delivery of pharmacology across nursing programmes in the three educational institutions.</td>
<td>UK</td>
</tr>
<tr>
<td>Ives, G., Hodge, K., Bullock, S. and Marriott, J.</td>
<td>1996</td>
<td>First year RNs' actual and self-rated pharmacology knowledge'</td>
<td>Australian Journal of Advanced Nursing</td>
<td>Quantitative: a postal questionnaire of first year registered nurses (n=363).</td>
<td>Participants overestimated their pharmacological knowledge. Newly qualified nurses had inadequate knowledge of pharmacology. Higher scores were associated with longer experience as registered nurses.</td>
<td>Australia</td>
</tr>
</tbody>
</table>