ASSESSING THE IMPACT OF INTERPROFESSIONAL EDUCATION (IPE) ON MEDICAL STUDENT ANXIETY: A QUASI-EXPERIMENTAL STUDY

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CERTIFICATE OF AUTHORSHIP/ORIGINALITY

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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Abstract

Improving collaboration and communication in maternity care is key to increasing safety for women and babies. Different professional groups perceive 'collaboration' differently, with doctors regarding collaboration as conversations with their medical colleagues or where midwives/nurses carry out doctors' orders. Nurses and midwives perceive collaboration as shared conversations with all members of the healthcare team, where their opinions are listened to and they actively contribute to patient care. These two worldviews provide insight into the challenges faced by the healthcare system in attempting to improve patient safety.

This study addresses one aspect of collaboration and communication by examining the impact of a program of 'Interprofessional Education' (IPE) on medical student anxiety during their Labour Ward clinical experience. IPE has been proposed as a means to improve collaboration and communication among health professionals although few studies have been able to demonstrate this link. The student experience in the Labour Ward was chosen as an example of a highly stressful component of the undergraduate medical student education program. Students have reported their experience in Labour Ward as being extremely stressful and midwives as 'the women from hell' (Lemmp & Seale 2004). The long-term hypothesis underpinning the study was that by providing medical students with a very positive and stress reducing experience, facilitated by a midwife mentor who role modelled collaboration and excellent communication between professional groups, students' perceptions of their future colleagues would be enhanced and this would be demonstrated in more collaborative behaviour. In the short term, the question to be explored in this thesis became: Can a particular model of IPE reduce medical student anxiety in labour ward?

This study used a quasi-experimental design, with Before and After surveys to collect data from two groups of students experiencing one of two models of IPE (IPE1 and IPE2) across three different sites. IPE1 provided a midwife "champion" to introduce students to the birth unit, other staff members and women; and to model exemplary care for women throughout labour and birth. IPE 2 provided a model of care where students engaged opportunistically with any 'available and willing' midwife/doctor on duty who was caring for any woman at any stage of her labour and birth, in order to meet their learning objectives.

Following institutional ethical approval, a total of 105 fourth year medical students were enrolled in the study. Seventy students completed both Before and After surveys (66% Response Rate). The Spielberger State - Trait Anxiety Inventory (STAI), a well - known 40 – item validated measuring instrument, commonly used to measure anxiety in university students, was used to measure anxiety. The students were also invited to complete a Clinical Experience Logbook, to provide a simple description of the number and type of clinical experiences to which students in each location are exposed. Space within this logbook was provided for students to express their comments and reflections regarding care they had given to women in labour. This was also to record care (in the form of educational experiences, anxiety inducing experiences and general "care" of the student by midwives) that they had received during their labour ward placement.

The results of the study revealed that students who experienced IPE1 had significantly lower STAI (State Anxiety) scores at the end of their clinical experience placement (difference -6.5, SE 1.7, p=0.0003) than students who experienced IPE2 (difference 0.8, SE 2.1, p=0.7000). Therefore a model of Interprofessional Education that provides medical students with a midwife mentor to facilitate their clinical experience and learning opportunities in labour ward has been demonstrated to have a positive effect. Further studies are required to determine if this model of IPE has a positive impact on students' perceptions of their working relationships with medical and midwifery colleagues and whether these perceptions remain following graduation.

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Chapter 1: Background to the study

The purpose of this quasi-experimental study was to examine the impact of Interprofessional Education (IPE) (in the form of a midwife mentor/preceptor) on medical student anxiety and learning experiences during clinical placements in maternity care settings.

In this chapter, I describe the background to the study and my personal interest in the issue of interprofessional education and the education of medical students, in particular. I justify the study by exploring a number of assumptions about the potential benefits of models of interprofessional education in preparing professionals working in maternity services.

1.0 Why am I interested in this topic?

I am a midwife with 30 years of clinical experience in a diverse range of settings; in remote, rural and isolated maternity practice, in large tertiary hospitals and at homebirths; and as an independent midwife in one of the first midwifery group practices in Australia to gain visiting rights to maternity units. I have had extensive experience as a women's health and sexual health nurse and as a nurse practitioner in the first pilot study of nurse practitioners in Australia. I have tertiary qualifications in adult education and public health/health promotion and family planning. This brief history is presented as evidence of the breadth of skills I bring to my most recent role. where during the past five years I have been working as an associate lecturer and mentor for medical students during their rotation to Labour Ward for clinical learning. A particular focus of this time is to facilitate the medical students' exposure to, and therefore learning about, women experiencing normal birth. During the clinical practice experience I also facilitate positive interactions and professional relationships between the midwives on the unit and the medical students, so that the students learn about the professional role of midwives.

In this role I am making an assumption that I fulfill the criteria of a mentor as "an experienced and trusted adviser: an experienced person in an institution who trains and

counsels new employees or students" (Pearsall, 2002). This mentorship role is unusual since I take a caseload[1] of women and while providing care I am accompanied by medical students and engage them in learning opportunities with the woman and her family as part of her care-team. I regard this as a model of Interprofessional Education where

> "...members (or students) of two or more professions associated with health or social care, [engage] in learning with, from and about each other" (Barr, Koppel, Reeves, Hammick, & Freeth, 2005).

I am not aware that any other medical schools in Australia have established this model of IPE, although the clinical midwife educator at the Royal Darwin Hospital has described a slightly different mentoring relationship between midwives and medical students in her setting (Bull, 2008). She describes her role as supporting and encouraging midwives to engage in working with medical students; the educational role of the clinical midwife educator in this setting includes clinical bedside teaching and tutorials.

Elizabeth Ali, a midwife in the UK, teaches medical students in a simulated setting but she does not teach in the labour ward. Ali describes how she holds clinical tutorials, lectures and liaises with other staff for the benefit of medical students undergoing their labour ward placement (Ali, 2005). Ali sees her role as facilitating multi-disciplinary, interprofessional education with a particular emphasis on addressing the negative attitudes of the medical students towards being 'taught' by a midwife. Ali (2005) and Fraser (2006) also found, as I have done that unless the midwife approaches labouring women personally compared with the student making the approach, they are less likely to accept a medical student observer (Ali, 2005; Fraser, 2006). In the model of IPE that I have developed, students and in particular male medical students, are more likely to be accepted[2] by women as 'the midwife's helper'.

During my mentorship role I have become aware of a level of apprehension, and in

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[1] Caseload in this instance means the provision of intrapartum care for one or two women during an eight to ten hour shift in labour ward. This is not to be confused with the caseload model of care where a midwife provides care for an individual woman from the beginning of pregnancy, throughout labour and birth and up to six weeks post partum.

[2] Women are asked if they will agree to have a medical student participate in their care in order for the student to gain clinical experience of childbirth

some medical students, fear of coming to labour ward. This appears to be for two main reasons. Firstly the labour ward is a high stress environment and secondly because midwives have a reputation of being "the women from hell" according to a relatively recent study by two UK researchers (Lemmp & Seale, 2004). It would appear from the medical student perspective that they are treated poorly with some reporting they are either ignored or shouted at for 'being in the way'. I would like to know more about the students' expectations and experiences of their time on labour ward in order to better inform the particular model of IPE we have developed and to explore whether this style of IPE can break down barriers and enhance interprofessional communication.

Writers in this field appear to assume that IPE can successfully break down barriers and enhance interprofessional communication (Freeth, Hammick, Reeves, Koppel, & Barr, 2005). There is also an assumption that IPE will ultimately enhance the quality of patient care and improve safety (Humphris, 2004; McPherson, Headrick, & Moss, 2001). However the effectiveness of IPE is yet to be established despite some studies having used the most robust research design of the randomised controlled trial (Thompson, Kinmonth & Stevens et al. 2000 in Barr et al. 2005).

A further assumption concerns the 'hidden curriculum' in operation during the medical student's participation in a woman's experience of normal birth. This means "the set of influences that function at the level of orgnisational structure and culture including, for example, implicit rules to survive the institution such as customs, rituals and taken for granted aspects" (Lemmp & Seale, 2004, p770). This exposure, it is thought, will not only provide a learning experience about how normal labour unfolds, but may also inspire students to consider a future career in maternity care and to learn how to communicate and collaborate with another group of health professionals (Brown & Vause, 2006; Hamilton, 2006; Higham, 2006; Quinliven, Black, Petersen, & Kornman, 2003; Turner, Lambert, Goldacre, & Barlow, 2006).

1.1 Justification for this study

This research is important to undertake for three main reasons that I will discuss below. The first concerns the establishment of an effective and safe learning environment for the student. Broadly the other two reasons encompass the (assumed) contribution of

IPE to patient safety through improved communication, collaboration, teamwork and trust amongst health professionals; and secondly that IPE may positively influence workforce issues in obstetrics. The scope of my study is however limited to the first issue of establishing effective and safe learning environments for students.

1.1.1 Establishing effective learning environments

Effective learning environments include the provision of diverse learning experiences. An interesting descriptive paper by Leggat (2000) contains a broad definition by Jayawickramarajah (1987) in which learning experiences are described as both "planned teaching, learning and communication methods or institutional strategies" and "incidental experiences encountered" (Leggat, 2000, p288) by the student, in a range of placements, for example, university, hospital or community. Any teaching and learning incident that smooths the way for the student to attain specific learning outcomes by meeting the learning objectives, is a learning experience. Leggat explains this is a broad definition and includes, as well as the more traditional institutional strategies such as problem based tutorials, lectures, projects and assignments, more recent developments such as interactive computer programmes, (e.g., the K2[3] programme focusing on fetal wellbeing and interpretation of cardiotocographs) telemedicine and virtual reality teaching/learning formats. Of note is the finding that Leggat (2000) makes no mention that the learning experiences can be taught or facilitated by persons other than doctors. It would appear that in the year 2000, the idea of multi-disciplinary or interprofessional education had not yet reached the prominence that it now appears to enjoy.

Midwifery studies examining aspects of IPE include that of Loveridge and Fiander (2007) who described a UK survey to determine the level of midwives' involvement in medical education and how other midwives had approached this. They surveyed the academic heads of 30 UK medical schools to discover whether midwives were formally employed to deliver either undergraduate or postgraduate medical education. The survey had a 90% response rate with 20 schools reporting that they employed midwives in classroom based undergraduate medical education, with 13 reporting this also

[3] Online fetal monitoring training system, University of Plymouth, UK

included postgraduate courses for senior house officers and obstetric consultants. A second survey was sent to the midwives employed in medical education roles to further investigate the extent of their role. Twenty-three midwives with an average of 19 years clinical experience and ranging from a Professor of Midwifery to H and G[4] grade midwives with a variety of role titles responded. The midwives reported that they delivered education in the classroom as well as in clinical settings such as labour wards. Most saw their role as fostering IPE and teamwork and enabling medical students to appreciate the role of the midwife and to experience the 'other side of obstetrics' where birth was most often 'normal'. Loveridge (a midwife) and Fiander (an obstetrician) concluded that their study provided a baseline of the situation in the UK, reassured Loveridge that she was not alone in her role in a medical school, and suggested further research was needed in teaching and learning across healthcare disciplines (Loveridge & Fiander, 2007).

In an ethnographic study of learning in six hospital labour suites in the UK, Fraser (2006) concurred with Hamilton (2006) in asserting that midwives were the gate keepers who determined whether or not any student, but in particular, male medical students gained access to labouring women. Fraser further developed Hamilton's understanding by revealing that the ward manager is the role model and leads staff in supporting – or not- the learning opportunities for students in the unit. Three recurring themes were revealed in Fraser's study; role models, positive ward cultures and positive attitudes, facilitated others to support learning opportunities for students. If the ward manager set up systems to facilitate learning then staff members were more likely to support student involvement. Fraser observed that students (midwifery or medical) were sometimes not welcomed formally, were sometimes not even shown to the tea room or oriented to the unit and students were left wondering what was acceptable behaviour in terms of taking breaks, having access to tea or coffee or even whether or not they were permitted to put their lunch bag in the unit's refrigerator. On two occasions, students experienced interprofessional conflict occurring in front of the labouring woman and, without appropriate support, were left feeling uncomfortable. Leadership was critical. If the labour ward co-ordinator was respected professionally and personally, midwives were well supported "...to keep labour normal where

[4] These grades indicate the experience, responsibilities and salary rates of UK midwives.

possible and medics and midwives worked more like a team and less like a hierarchical structure" (Fraser, 2006, p200). In these settings students were well supported and were more likely to use their initiative "...as they were not made to feel silly if they got it wrong" (Fraser, 2006, p202).

Quinliven (2003), an Australian doctor, acknowledged the work of midwives teaching medical students in a study involving both parties. Her paper was one of the first to state that midwives have always been involved in the education of medical students, and that this work has been to a large extent, unrecognised. Quinliven surveyed midwives and medical students to determine the extent of midwives' knowledge of the medical student learning objectives when on labour ward and discovered they knew very little. She also reported that despite very few midwives having formal qualifications in teaching or adult education they were key teachers of medical students. Clearly, according to Quinliven, midwives are involved in providing IPE in their work with medical students.

IPE recognises the need for the development of competencies for collaboration and communication (including teaching/learning skills and strategies) between midwives, nurses and doctors (Armitage, Pitt, & Jinks, 2008; Crofts, et al., 2007; Jung, Salvatori, & Martin, 2006; Reeves, Goldman, & Oandasan, 2007). It has however, been recognised that the teaching style of some doctors and midwives needs to be improved (Lemmp & Seale, 2004). The most complained about and feared teaching style was that of the medical consultant who adopted techniques of humiliation; a major source of stress in medical students (Firth, 1986).

One early UK study reported that levels of stress, skills and sensibilities of both nurses and medical students were improved when they were brought together in structured learning groups in a minor surgery skills course (Nestel, Kneebone, & Martin, 2004). Both groups gained an improved understanding of the others professional role and reported enjoying the experience, with a subsequent reduction in their anxiety around learning.

Mixed medical and midwifery teaching was also well received in a Scottish study about care of women in labour (Mires, Williams, Harden, et al., 1999). All 3rd year medical students and 1st year midwifery students participated in a structured two week program which included joint lectures, problem based learning sessions, clinical skills training and a two hour integrated teaching/learning session that encouraged students to interact around clinical problems and professional issues. The course was taught jointly by medical and midwifery tutors. The majority of students rated the program as " ...the same or [a] more useful learning activity than other learning programs in their curricula [and] 91% of midwifery students and 81% of medical students felt that multi-professional teaching should be introduced in other parts of their course" (Mires, Williams, Harden, et al., 1999, p284).

These studies provide evidence that developing effective learning environments is a key aspect of improving learning experiences and reducing student anxiety. Interprofessional education strategies are one way of addressing this issue. My proposed study is therefore justified as it will make a contribution to this body of knowledge. The next section examines a further important component of my study that adds further weight to this justification, that is the issue of the relationship between collaborative practice and safety.

1.1.2 Safety of clinical practice

Over three decades ago in the UK, the death of a young girl from abuse and neglect identified the need for vigorous pursuit of greater collaboration between health care workers (Barr, 2002). Health visitors, social workers, community nurses and their colleagues discovered a plethora of professionals had been involved in the care of seven year old Maria Colwell. They found communication between them was either non existent or so poor that her death prompted the call for a national public inquiry. One of the consequences of the inquiry was the identification of the lack of co-operation and communication between professional groups, and this was an important factor in bringing about the call for what came to be termed Interprofessional Education (IPE) and Interdisciplinary Collaboration. It was proposed that providing joint education programs for diverse professional groups would enhance their understanding of each other's scope of practice, improve appreciation for each other's

expertise and enhance collaborative relationships and communication between the professions. The result was anticipated to be increased safety for those accessing our health care systems.

Safety is an issue of great concern in maternity care where essentially well women are undergoing a normal life process. Medical and midwifery professionals aim to ensure that women and their babies are safely supported through this life process and that women come through it enabled to carry out the challenges of new motherhood. There is a wealth of evidence that current teamwork and collaboration among health professionals working in maternity care is often not achieved and arguably, women and their infants suffer (Douglas, Robinson, & Fahy, 2001; Lewis & Drife, 2001).

Emphasising collaboration between health professionals is a comparatively new approach to improving safety in health care that has gained worldwide prominence in health policy (Meads & Ashcroft, 2005; Whitehead, 2007). However it has taken a considerable length of time to come of age, during which certain catastrophic events have occurred in developed countries as a result of the failure of health agencies to have in place systems that enable professionals to collaborate (Conway, 2008; Rice Simpson, James & Knox, 2006; Joint Commission on Accreditation of Healthcare Organizations 2004).

In Australia, the Final Report of the Special Commission of Inquiry: Acute Care Services in NSW Public Hospitals (Garling, 2008)–known as the Garling Inquiry, came about in response in particular, to the death in 2008, of Vanessa Anderson, a 16 year old girl admitted to hospital following a head injury from a golf ball. In the case of Vanessa Anderson the coroner observed, "…there is little doubt that the New South Wales health system, while certainly staffed by dedicated professionals, is labouring under increased demands and expectations from the general public - unfortunately, the same issues are invariably identified: not enough doctors, not enough nurses, inexperienced staff, poor communication poor record keeping and poor management" (Garling, 2008, p48). The coroner noted that these were systemic problems that have existed for a number of years and that "It is almost impossible to avoid comment on the unfortunate repetition of the same systemic problems that continue to surface (Garling,

2008, p6). The tide however is turning. These tragic cases may not have happened in vain. Collaboration is now seen as a must in all areas of health to avert tragedies such as the one mentioned above. If collaboration is the 'forest floor' from which all else grows, education is always there coming along with its own 'seeds' for sowing. Interprofessional education therefore potentially provides a way of improving collaboration.

In a recently published qualitative study in which she reports on (amongst other things) research aimed at finding ways to promote more effective interprofessional interaction from the perspective of doctors and midwives, Hastie (Hastie 2008) alludes to the 'turf war' (Hastie, 2008 p1) which continues between doctors and midwives, and advances the theory that these two groups of health care professionals view collaboration very differently. This finding concurs with Krogstad and colleagues (Krogstad, Hofoss, & Hjortdahl, 2004) who found that doctor's ideas of cooperation meant nurses assist and carry out orders without fuss. On the other hand, nurses feel that collaboration occurs when they are listened to respectfully and are active participants in the decision-making and treatment planning for patients (Zwarenstein & Bryant, 2004).

One way to approach collaboration and teamwork is through models of education where students learn about teamwork in the classroom, but this 'uni-professional' model of education has been criticized as inadequate (Freeth, et al., 2005). A more preferable approach is to engage students in a collaborative education model where professionals from different groups work together in education and practice settings in what is known now as interprofessional education (Barr, 2002; Freeth, et al., 2005; Jung, et al., 2006; Nestel, et al., 2004; Reeves, et al., 2007).

Centuries of animosity between midwives and obstetricians (articulated in many historical reviews of childbirth and revealed in more recent national and international studies of birthing services) have led to an underlying current of lack of trust between the two professional groups (Donnison, 1976; Douglas, et al., 2001; Ehrenreich & English, 1979; Hastie 2008; Lewis & Drife, 2001; Australian Maternity Services Review, 2009). Lack of trust leads to impaired communication between two professional groups charged with the responsibility for the delivery of safe maternity

care, thus placing mothers and babies at risk. This has been articulated in North American literature that points to the death of mothers and babies as a result of communication breakdown between doctors and nurses (Rice Simpson, James, & Knox, 2006; Rice Simpson & Knox, 2001). In the UK, the numerous confidential enquiries into maternal deaths also cite the lack of teamwork and communication and boundaries between midwives and doctors as factors that increase risk for the wellbeing of mothers (Cullen, Fraser, & Symonds, 2003; Lewis & Drife, 2001). In Western Australia, an inquiry into the safety and quality of maternity services at King Edward Hospital also revealed a lack of communication, teamwork and trust between midwives and obstetricians as key factors in increasing risk for women and babies (Douglas, et al., 2001).

Strategies need to be explored that will overcome the lack of trust between the two professions and enhance communication and thereby safety for mothers and babies.
A range of research evidence suggests that IPE is one way to improve communication and trust (Barr, 2002). One innovative educational practice established in some centres around the world is to have midwives involved in the education of medical students. This has taken the form of conjoint classroom education in some instances (Cullen, et al., 2003) and in others involves the midwifery mentorship of medical students during their clinical placements in labour wards (Quinliven, et al., 2003).

There has been little research undertaken to date to examine whether the midwifery mentored clinical experience improves communication and enhances trust between the two groups and according to Brodie, trust is 'the defining element' in any human relationship, (Brodie, 2003). The study undertaken in this thesis will add new information to address that gap in knowledge and therefore ultimately contribute to increasing our understanding of the contribution of IPE to patient safety (Krogstad, et al., 2004). The next section explores the final element of the justification for my study.

1.1.3 Workforce planning issues

The final element that contributes to the justification for my study is that of workforce planning. There is concern expressed by the colleges of obstetrics and gynaecology in several countries regarding the decreasing numbers of medical graduates choosing to

work in maternity care (Brown & Vause, 2006; Higham, 2006). Numbers of reasons have been cited such as unsociable hours, litigation and bullying but some include medical students' ratings of their clinical experiences in maternity care as unsupportive and anxiety provoking (Hamilton, 2006). With literature citing only 0.2% (Hamilton, 2006, p112) of newly qualified doctors choosing obstetrics as a career, it is timely that more attention was paid to this issue and strategies such as effective IPE and increasing the role of midwives in the educational preparation of doctors, were explored to inspire medical students to consider obstetrics as a desirable career (Hamilton, 2006).

1.2 Summary

This opening chapter has revealed the background to my study that arose out of my role as a midwife mentor to medical students in labour ward and the identification of their levels of anxiety. In addition, the chapter has revealed some of the many reasons why exploring the issue of IPE in the education of maternity care professionals is an important topic to pursue. Improving safety in maternity care through addressing the issue of poor communication and trust between professionals involved in women's care is an issue faced by every health service in Australia, as elsewhere. Focusing on the educational experience of medical students studying childbirth can add new knowledge and understanding to the complex interrelated picture of maternity care. Anxious medical students who are fearful of midwives and fearful of their labour ward clinical placement may not enjoy learning about childbirth and may develop an attitude of mistrust of a group of health professionals that they may carry with them for the rest of their medical career. There is some emerging research evidence that the issue of trust between professional groups is key to safe maternity care. Interprofessional education offers some hope that there are techniques available that will address the issue of mistrust through improving communication and collaboration between professional groups. We also need to develop an enthusiastic workforce of skilled medical, obstetrically trained professionals who have a clear understanding of and respect for the complementary roles of midwives and doctors in the care of childbearing women. Well-supported medical students who enjoy their educational experience in maternity care are more likely to emerge with a positive regard for pursuing obstetrics as a career.

1.3 Structure of the thesis

In Chapter two I explore the large body of research literature on the topic of interprofessional education. The three key findings emerging from this review are that there is increasing evidence that IPE is an effective educational model for health care professionals; that IPE is a growing global movement, but also that the implementation and dissemination of IPE is challenging. The chapter also provides an examination of the relationship between learning and anxiety which reveals why I have focussed on anxiety as the primary outcome measure in my study of IPE and medical students.

Chapter three outlines the design of the study, the data collection tools, the ethical issues I have considered and the method of data analysis. It also provides a detailed discussion of the piloting of the survey administration process, the data entry and the analysis. While a randomised controlled trial of the IPE intervention was the preferred study design, I provide an explanation of why this was not possible and a quasi-experimental design was ultimately undertaken.

The results of the study are presented in Chapter four which reveals that the IPE intervention was able to significantly reduce medical student anxiety. Additional findings reveal the expectations of this group of medical students when about to undertake their clinical rotation to a labour ward.

Chapter five provides a discussion of the results of the study and the implications for education and practice; explores the limitations of this study design and proposes further research that needs to be undertaken in this area. The study is concluded in this chapter with an examination of the current and often reluctant role of midwives in the education of all students, but of medical students in particular. This chapter challenges midwives to reconsider the potential changes to maternity service outcomes that could occur if a well supported, skilled and wise midwifery workforce enthusiastically embraced the education of all healthcare students.

Chapter 2: Interprofessional Education and Student Anxiety

2.0 Introduction

This chapter is divided into two sections. In the first section I examine the way that the effectiveness of models of Interprofessional Education has been researched. I have used this examination of the research to inform the design of my own study by taking notice of the critique and recommendations from various studies and systematic reviews. The seminal work of Professor Hugh Barr and his colleagues features largely in this part of the chapter since this group is widely considered to be most responsible for the promotion of the concept of IPE (Barr, 2002; Barr, et al., 2005; Freeth, et al., 2005; Meads & Ashcroft, 2005). The chapter considers the hypothesised link between the preparation of undergraduate health professionals using an IPE approach and improved patient outcomes. The second section of the chapter considers what it is about undergraduate IPE that might make a difference to future health professional practice by examining the relationship between learning and anxiety. This section provides the rationale for selecting student anxiety as the primary outcome in this study.

2.1 SECTION 1

2.1.1 Interprofessional education – a global movement

IPE is now a global movement in health as relationships between healthcare providers have been identified as the key to improving patient safety and community wellbeing. Successful patient care has become redefined as the sum of professional collaborations in which governance (hospital or institution) mechanisms seek to harness the complexity of different contributions made by a range of doctors, nurses, midwives and other health professionals (Meads, 2006). In developing countries, the workforce is now perceived as 'teams of people' rather than 'professional tribes' and this is clearly also an IPE goal for the resource-rich, developed world (Meads, 2006).

Since Interprofessional Education was first mooted 30 years ago, it has gained momentum concerning itself with primary care[5] (Meads, 2006) and primary health care[6] although it should be acknowledged that there is some confusion between the two approaches.[7] Primary health care is more aptly the home of IPE since it involves multidisciplinary teams (Brodie, 2003). IPE exists in many names and guises, with nomenclature including collaboration, cooperation; communication; partnerships, interprofessional teamwork; interdisciplinary and multidisciplinary, to name a few examples. The proponents of IPE are professional groups such as social workers (Meads & Ashcroft, 2005) nurses, doctors and midwives who want to make collaboration work for the improved wellbeing of 'the patient'.

In a book that romps across six continents, visiting 33 countries in 34 months, Meads (2006) tells a thrilling story using qualitative research that brings cohesion and clarity to his clarion call for IPE. Meads uses primary health care in all its guises to provide the foundation upon which to proselytise about the potential utility of IPE. Many aspects of interprofessional education and collaboration are outside of the scope of this chapter; suffice to say that from the World Bank, the World Health Organization and United Nations Educational and Scientific and Cultural Organisation (UNESCO) down, there exists a strong and growing movement in health, calling for practices exemplified by 'inter-professionalism' with its agenda of breaking down hierarchies. All of the countries Meads visits recognise that health improvement calls for partnership, and the partnerships are usually made up of three components: policy: made and mandated by government - usually in response to economic and social trends; practice: consisting of nurses, midwives, doctors and other health providers, and education: which not only responds, but also initiates change and acts as a change agent in its own right. For the

[5]**Primary care** is often used interchangeably with primary medical care as its focus is on clinical services provided predominantly by GPs, as well as by practice nurses, primary/community health care nurses, early childhood nurses and community pharmacists (retrieved 24/10/09 from www.phcconnect.edu.au/defining_primary_health_care.htm).

[6] **Primary health care** incorporates primary care, but has a broader focus through providing a comprehensive range of generalist services by multidisciplinary teams that include not only GPs and nurses but also allied health professionals other health workers and families, PHC services also operate at the level of communities (retrieved 24/10/09 from www.phcconnect.edu.au/defining_primary_health_care.htm).

[7] The significance of this debate lies in the possible confusion between these two approaches; different people may mean vastly different kinds of health care and yet both are known as primary health care. In addition, the actual services provided by selective or comprehensive PHC may not differ greatly in practice; it is therefore important to identify the underlying values of any primary health care service as it is these which will determine the nature and overall aims of the service (retrieved 24/10/09 from www.phcconnect.edu.au/defining_primary_health_care.htm).

purposes of my research study, I will focus on the idea that education can initiate change towards preparing health professionals who have an improved understanding of the diverse benefits of inter-professional practice for both the recipients and providers of healthcare.

IPE activities are also an integral part of the Australian health education landscape. An Australian midwifery leader, Brodie (2003) who is a strong advocate of IPE, has recently led a successful collaboration between the obstetric and midwifery professional colleges in Australia to establish a conjoint national conference called 'Breathing New Life Into Maternity Care[8]' which aims to promote and improve interprofessional collaboration including IPE. Brodie is also engaged in current IPE research with an interprofessional team of health and education academics from a range of disciplines under the acronym of L-TIPP; Learning and Teaching for Interprofessional Practice (L-TIPP, 2008). L-Tipp is a national development and scoping project that aims to increase the capacity of the higher education sector to graduate health professionals who have acquired well developed interprofessional learning and interprofessional practice capabilities. Interprofessional practice capabilities have been identified as essential for effective, safe and sustainable healthcare (L-TIPP, 2008).

2.1.2 The link between undergraduate IPE and health outcomes

A whole industry has arisen around IPE in health with the raison d'être, the patient, at the forefront of all endeavours. An example of this is revealed in a recent paper by Canadians, D'Amour and Oandason (2005), in putting forward what they regard as their new concept called "...Interprofessional Education for Collaborative Patient - centred Practice" (p10). The key point made in this and a subsequent paper is that it is "...necessary to make a distinction between *educational initiatives to enhance learner outcomes* and collaborative *practice to enhance patient outcomes*" (D'Amour & Oandason, 2005, p11; Oandason & Reeves, 2005). This also describes the two related but distinct aspects of IPE research endeavours. There are in fact two bodies of

[8] Retrieved on 17th Jan 2010 from http://www.breathingnewlife.remark.com.au

literature and most is focused on whether IPE activities with already registered and practising health professionals achieves enhanced patient outcomes. Far less recent research considers whether IPE enhances learner outcomes and even less considers how IPE for undergraduates might ultimately influence health outcomes in patients. This is an important issue to consider. My study will not be able to assess patient outcomes as it focuses on IPE in the undergraduate education of one group of future health professionals who are part of the healthcare team. To assess the impact of undergraduate education programmes that take an IPE approach, on patients, would require longitudinal studies that have not yet been attempted in the IPE research field and are certainly beyond the scope of a Masters (Honours) research project. The link between IPE approaches to undergraduate education and improved patient outcomes must remain a hypothetical link for the time being. My study sits within a framework of research in this area that will begin to increase our understanding of the impact of IPE on undergraduate learners. Once this has been established then future research will be able to explore the hypothesised link between enhanced undergraduate learner outcomes on patient outcomes.

These concepts of IPE and learner outcomes as well as IPE and patient outcomes informed my search of the literature.

2.1.3 Searching the literature

Interdisciplinary, multidisciplinary, intercollaborative, interprofessional, cross-disciplinary, transdisciplinary; all address a similar concept. This provides a challenge for the student of research endeavoring to undertake a literature search, since the search terms must include many alternatives. Therefore my literature search was undertaken using the search terms; "midwives and medical students', "medical students and midwives", "collaboration between nurses and doctors", "interprofessional education", "interdisciplinary education", IPE and learning outcomes, and patient/client outcomes; and the databases of CINAHL, Pubmed, Medline, MIDIRS, OVID, Psychlit, and the Cochrane Database of Systematic Reviews. Initially by only using the narrow terms "midwives and medical students" and their reverse, I located 80 relevant references, but in subsequent searches using the broader terms "interprofessional education" or "interdisciplinary education" I located many further studies. My initial focus was on

any literature that described any aspect of IPE, but ultimately I refined my interest to studies that were specifically designed to evaluate models of IPE. My search of the literature finally located 150 relevant articles that are reviewed in the following section. I focus my review of the IPE literature on considering four main issues; firstly in response to D'Amour and Oandason's (2005) challenge I consider, "Does teamwork improve health outcomes?" This is followed by an exploration of the question, "Does IPE improve student learning?" Next, I examine the study designs used in IPE research and their limitations and finally, I summarise the key recommendations concerning further research in the IPE literature.

2.1.4 Does teamwork improve health outcomes?

A systematic review undertaken by Zwarenstein and Bryant in 2000 and updated in 2004 (2004) reported on two trials. The first by Curley, McEachern & Speroff (1998) was a randomised controlled trial undertaken in a hospital. The main aim of the research was to initiate a new way of running the daily ward round, so that doctors and nurses made joint decisions about their patients' care. There were three intervention wards and three control wards that continued to use the usual model of doctors-only, doing ward rounds, making decisions and writing orders for care-delivery that the nurses were expected to carry out without question.

There were 1102 admissions to the intervention and control wards during the 6month trial. The patient groups were similar in demographics and variables such as age, insurance status and case mix. The main outcomes of interest were length of stay for all patients in each setting, the costs of care, and mortality rates. While length of stay was modestly reduced, as were some costs, there was no effect on mortality. The trial gave only a small indication that working together as a team, that is collaboratively, may be of value as staff on the intervention wards reported more satisfaction, stronger perceptions of working as part of a team, good communication and more understanding of patient care.

The second and quite similar study identified by the authors has been referred to in the past as the first RCT in IPE, however is now referred to as a Controlled Before and After (CBE) study since it is clear that randomisation did not formally occur (Jitapunkul, Nuchprayoon, Aksaranugraha, et al., 1995). This study compared two

wards of female patients over a three-month period where the intervention ward had 199 admissions and the control 218. The aim was to evaluate the impact of a four times per week ward round during which management plans were jointly decided, and a weekly case conference held. Randomisation was claimed however it was not clear how this was done which is why the study has been downgraded. The study found no significant differences between the intervention and control wards in total average length of stay for all patients (11.7 days in the intervention wards versus 11.6 in the control wards); mortality rates were not different.

Zwarenstein and Bryant's (2004) systematic review had restricted itself to three research designs, which were: randomised controlled trials (RCT's), controlled before-and-after studies (CBA's) and interrupted time series studies. This resulted in few studies being identified. Following on from this, the Interprofessional Education Joint Evaluation Team (JET) performed a second systematic review, and widened the "net" to include studies less constrained by the restrictions of the RCT and CBA's.

Even so, best practice in research remains the RCT and the following describes one example of a trial to evaluate what the authors considered to be a model of IPE. This was a collaboration by university and service staff based in Southampton and Portsmouth in England. It resulted in the development of a randomised controlled trial to evaluate the impact on patient care of implementing a clinical practice guideline for the treatment of depression. Fifty-nine general practices were recruited into the trial. Practices were randomised to the intervention group (29 teams of general practitioners and practice nurses) who received a four-hour interprofessional education session on jointly implementing the guideline; or to a control group (30 teams). Control group participants did not receive their interprofessional sessions until completion of the trial. Evaluation of the impact of the new guideline was in the form of questionnaires distributed to intervention and control group participants before and after delivery of the sessions. In addition, depression scale scores of patients treated by the practitioners in both intervention and control groups were collected. The new guideline was well received by the participants, and in addition 80% felt their management of depression had improved as a result of the guideline being introduced. There was, however, no significant change to the depression scores of patients following the intervention (Thompson et al 2000 in Barr, et al., 2005). Barr concluded, studies of IPE need to

include large sample sizes since IPE interventions are complex and any effect is likely to be small

In their BMJ paper, Zwarenstein and Reeves (2000) called for more evidence that collaboration makes a difference. Zwarenstein and Bryant in their Cochrane review in 2000 found most of the articles written about collaboration were simply descriptive or rhetorical rather than research-based; a finding with which I agree following my review of the 150 articles I had located in my search. They also recommended that interventions other than doctor-nurse ward rounds and team meetings needed to be tested. Therefore a comprehensive review of IPE in the UK was subsequently undertaken by Hugh Barr and his colleagues from the organisation known as the Centre for the Advancement of Interprofessional Education (CAIPE) (Barr, 2002). Their review provides an historic overview from the early 1960s of the IPE experience in the UK. The review revealed the domains of interest in IPE are those of communication, collaboration, teamwork and trust but there is insufficient evidence to justify the belief that IPE interventions will be followed by sustained improvements in these interprofessional domains. Barr and colleagues also identified that there was little evidence that IPE was effective although it was highly regarded and endorsed by many. Barr asserted that the lack of evidence should not deter health professionals, educators and researchers from continuing to explore the issue.

In order to comprehensively address the issue of effectiveness of IPE, Barr subsequently edited a series of three books under the banner of "Promoting Partnership for Health". These three volumes provide important insights into the justification for IPE (Meads & Ashcroft, 2005) and assumptions about IPE (Barr, et al., 2005); for developing models of IPE, and for systematic and rigorous evaluation (Freeth, et al., 2005).

According to Barr et al (2005) most IPE initiatives involve nurses (the largest representatives in IPE studies (95%), followed by doctors (82%). Other health care groups represented are chiropodists/podiatrists, complementary therapists, dentists, dieticians, hygienists, psychologists, psychotherapists, midwives, pharmacists, physiotherapists, occupational therapists, radiographers, speech therapists and/or social workers. The main outcomes of interest are the impact on health care outcomes (e.g. mortality rates, complication rates, readmission rates) and impact on professional

practice (e.g. teamwork and co-operative practice). The types of outcome measures used are objectively measured or self reported (using validated instruments) patient/client outcomes in the following areas: health status measures; disease incidence, duration or cure rates; mortality; complication rates; readmission rates; adherence rates; patient/family satisfaction; continuity of care; costs to carer, patient/client or health service.

My study involves a group not mentioned by Barr and colleagues in the detailed list provided; that is, undergraduate students of medicine. Most of the research reviewed by Barr et al (2005) concerns the impact of IPE on already graduated, registered and practising health professionals. My study is located within a relatively new area of IPE research with its focus on outcomes for undergraduate students. Several studies are reported in the IPE literature that also focus on student or learner outcomes and I consider those in the next section in addressing the question 'does IPE improve student learning?'

2.1.5 Does IPE improve student learning?

One of the recent trends in maternity care has seen the development and implementation of several models of emergency skills training using an interprofessional format. This has included programs with acronyms such as ALSO, PROMPT and FONT to name a few. These focus on 'fire drills' of emergency responses to rare issues within clinical settings such as maternal and neonatal collapse requiring urgent resuscitation, ante and post partum haemorrhage, and shoulder dystocia (ALSO – Advanced Life Support in Obstetrics; PROMPT - PRactical Obstetrics Multi-Professional Training) as well as key clinical issues that often lead to requirements for urgent intervention, such as the assessment of fetal welfare and interpretation of Cardiotocographic recordings of fetal heart rate and contractions (FONT – Fetal welfare and Obstetric and Neonatal resuscitation Training). Each of these programs, which have been developed in the UK, USA and Australia, has been established with a strong acknowledgment of the interprofessional nature of clinical practice and patient care (Brodie, 2003). Each program therefore requires that the program is delivered using an interprofessional teaching team and interprofessional delivery format. Clearly these are examples of IPE delivered to qualified health

professionals, however none has included non-qualified professionals or specifically targeted students of the health professions. Some of the programs have been evaluated in terms of patient and learner outcomes as described below.

In one example, Draycott and his team from Bristol in the UK have published widely in the area of evaluating interprofessional emergency skills training and 'fire drills' in clinical settings (Crofts, et al., 2007; Draycott, et al., 2008; Draycott, et al., 2006; Siassakos, 2009). This group has revealed that obstetric emergency training is associated with:

- a significant reduction in low 5 minute Apgar scores and neo-natal hypoxic-ischaemic encephalopathy (HIE);
- practical, multiprofessional, obstetric emergency training increased midwives' and doctors' knowledge of obstetric emergency management;
- the introduction of shoulder dystocia training for all maternity staff was associated with improved management and neonatal outcomes of births complicated by shoulder dystocia;
- a significant change in attitudes after training has been shown; in one unit there was a reduction of midwives' requests for sick leave by 45% after the introduction of obstetric emergency training.

However, most of the studies have used research designs such as cohort or observational studies, or retrospective before and after designs or, at best, non-randomised controlled designs with all their inherent limitations of unknown data accuracy and completeness (retrospective design limitations). Most of the evidence therefore, is subject to criticism that the positive effects seen may be transient and biased by the enthusiasm of local champions and is therefore not generalisable nor provides evidence of sustainable models of effectiveness. In the observational studies the researchers concede it is difficult to know what has led to the changes they identified. However, the improvements they have reported lead the researchers to recommend that there is an association between teaching programmes, and a reduction in morbidity from obstetric emergencies. Although the RCT is the 'gold standard' the findings from these studies are still important as they provide strong support for further research into whether

specific multi-professional (IPE) training in obstetric emergencies improves maternal and fetal outcomes.

2.1.6 Recommendations from the research

The following provides a list of recommendations from the various research publications that I considered in the design of my own study. This includes:

- Lack of evidence should not deter health professionals, educators and researchers from continuing to explore the issue of IPE;
- IPE interventions other than doctor-nurse ward rounds and team meetings need to be tested;
- Domains of interest in this field are those of communication, collaboration, teamwork and trust;
- Three research designs which have been used are: randomised controlled trials (RCT's), controlled before-and-after studies (CBA's) – called quasi experimental research in other texts, and interrupted time series studies;
- Types of outcome measures used are objectively measured or self reported patient/client outcomes using validated instruments;
- Studies of IPE need to include large sample sizes since IPE interventions are complex and any effect is likely to be small.

Several of these recommendations influenced the design of my study as outlined in chapter three. Briefly, I am undeterred by the lack of evidence of effectiveness and have chosen to continue to explore the issue of IPE in undergraduate education. I have chosen to focus on medical students as my population of interest; the intervention I will assess is a model of IPE in the clinical education component of an undergraduate medical education course – not ward rounds or team meetings; I will explore the domains of communication, collaboration, teamwork and trust through exploring whether a particular model of IPE influences student anxiety and I will use a CBA design and a validated instrument; Finally I have calculated the sample size that I need to have a sufficiently powered study.

One further important area of literature needs to be explored; that is, the relationship between learning and anxiety. In the next section I review this literature and

hypothesise how the relationship between learning and anxiety may be influenced by the model of IPE to be explored in this study.

2.2 SECTION 2

2.2.1 Background to my focus on Anxiety and Learning

To receive their orientation into Delivery Suite (Labour Ward), 4th year medical students in my hospital meet in a small area called Gum Gallery. This medium sized room doubles as the handover room (because of its privacy), a meeting place for various health care workers, and a place where the medical students are brought together for orientation into what is their first long period of clinical experience. They spend nine weeks in Obstetrics and Gynaecology. The groups are a mixture of young people who started studying medicine straight out of high school, through to mature age students several of whom have been post- doctoral scientists, and one who was a facio-maxillary surgeon in another country. They come from all parts of the world including Africa, United Kingdom, Jordan and Norway. A tall imposing looking fellow with a mop of blonde hair, in response to my question "What are your expectations of your clinical experience in Delivery Suite replied "I don't know if this is what you mean but frankly, I am terrified." He said this with no trace of theatre, in fact was blasé. The group was silent. I said I appreciated his honesty and I hoped the experiences offered with the help of supportive staff would allay his fears. His reply made me think more deeply about the clinical experiences the students were exposed to and how high anxiety might be addressed in order to enhance their learning and enjoyment of the experience of childbirth in particular.

This was one of those serendipitous moments that provided an opportunity to consider how to improve the effectiveness of learning and whether reducing student anxiety was a key. Student anxiety in the clinical setting can be a stumbling block to enjoyment and learning especially when the clinical placement is labour ward. Usually the birth of a baby is a joyous occasion for mothers, fathers and midwives, however the experience for medical students can be an anxious one as labour wards are traditionally difficult places in which to teach and ergo, learn.

It is my experience that the atmosphere in labour ward can be aggressive and competitive. Midwifery students and medical students, although in the same physical setting, are not taught together. Their clinical objectives are mostly the same, e.g. helping a woman during labour, taking maternal observations, blood pressure, temperature and pulse and interpreting the cardiotocograph (CTG), however rarely do their paths cross. No small wonder then that students of midwifery and medical students have no understanding of the complementary role of each other (Quinliven 2002). Also, teaching in labour ward raises its particular challenges, for example male medical student acceptance rates are 98% in general practice and accident and emergency settings; this plummets for male students in the labour ward to 62% (Quinliven, et al., 2003). The unpredictable nature and lack of control of the workload make for a clinical setting which can be busy and chaotic; for the student it can be a hostile and frightening place. Undertaking a rotation to a busy labour ward may arguably be the most challenging clinical placement a student can experience. Students may be confronted by labouring women who are vocalizing loudly or even screaming as their baby is being born; tense relatives who look frightened and are seeking support; the complexity of caring for two people at the same time when the whole of their education until this time has focused on the needs of one person only.

Interprofessional Education concerns improving working relationships in order to improve care (Freeth, et al., 2005). Positive role models and approachable teachers are two examples of what medical students value and perceive as useful characteristics for teaching and learning in the clinical setting and approachable teachers who provide a good role model and a friendly welcome are attributes that embrace IPE (Barr, et al., 2005).

Anxiety is known to be a disrupting influence on learning (Weinstein, Cubberly, & Richardson, 1982) and there are many examples to show it can have an adverse effect on learning. High stress levels and anxiety are particularly relevant to medical student education because of the pressure of the work, professional enculturation, and financial hardship. The clinical work of making the correct diagnosis is a factor which accounts for a considerable amount of discomfort (Pugh & Lawrence, 2007), and while appropriate levels of anxiety could assist some student's performance in examinations,

excessive anxiety can impair student performance (Yi-Chun, Cheng-Fang, Chung-Sheng, & al., 2007).

Medical students have been described as 'the racehorses' of the student world as some are slightly more 'highly strung' than say, law students, and the study and practice of medicine contains certain risks to the mental health of medical students and doctors that do not occur in populations of employed people in a similar age group (Firth, 1986). This is perhaps due to their clinical work and the responsibility they feel towards patients, although Stewart (1999) and colleagues in a longitudinal study found it difficult to make any link between the interrelationships of stress and academic performance. Nonetheless, an examination of the impact of stress and anxiety on learning is important for my study.

2.2.2 Review of literature around Stress, Anxiety and Learning

In this section of the chapter I briefly examine the history of the study of 'Stress' from the earliest writings of Freud in 1936 to the foundational research of Selye (1978) and the proposal of the 'General Adaptation Syndrome'(Selye, 1977). This is followed by an exploration of the research establishing the links between anxiety and learning and the application of this understanding in research with medical students. This provides further justification for my study and indicates gaps in the existing literature concerning ways of addressing medical student anxiety in clinical settings, so that effective learning can occur.

No review of the literature around learning and anxiety would be complete without reference to Freud, who in 1936 theorised and described the role for anxiety in personality theory as "...something felt, a specific unpleasant emotional state" (Spielberger, Gorsuch, Lushene, et al., 1983, p4). Around 50 years later, Selye, an experimental pathologist and 'godfather' of stress, defined, described and explained physiological pathways that were thought to form the construct of 'Anxiety'(Selye 1978). Initially Selye set out to discover a new sex hormone through a series of 'cruel' experiments using extracts of tissue that came from the ovaries of cows; or the kidney, liver or spleen from rats (Selye, 1978). When mixed with solvents (water, alcohol) the tissue extracts became an injectable solution, which was then injected into rats. Selye's

experiments demonstrated the experimental animals responded in a reproducible way to various insults, such as hunger and physical trauma including cold, and injections of formalin, which is an extremely toxic and irritating fluid. Selye identified physiological responses of the body that he described as the fight or flight syndrome, where hormones including adrenalin were identified and were thought to be responsible for anxiety. Selye propounded that prolonged exposure to the stress response increased the risk of anxiety, at a level the body finds difficult to endure over time. The discovery that some steroids were potent anaesthetics unlocked the area of neurosteroid research (Weissmann, 2007). Through this work, and his self-promoting behaviour, Selye proposed his general concept of stress and ultimately named it the General Adaptation Syndrome (GAS), later known as the Selye syndrome (Selye 1977).

Thus stress became famous and began to be regarded as one of the causes of bodily diseases. Over time, stress has been blamed for a myriad of diseases, from scurvy and herpes in the 1950's; to cancer as linked by Woody Allen, "I don't get angry... I grow a tumour instead" to the present day Post Traumatic Stress Syndrome (PTSS) (Weissmann, 2007). The American Institute of Stress (a Selye inspired institute) defines stress as "...the rate of wear and tear on the body" (Weissmann, 2007, p2636). Despite Selye being a prolific researcher and writer about stress, there is still much to understand about modern day stress (Weissmann, 2007).

2.2.2.1 Linking Stress and Anxiety

In a short space of time following publication of Selye's theory, stress became strongly associated with anxiety and evidence started to appear linking anxiety and stress (Weissmann, 2007). Links were made between the theory of anxiety and the 'unpleasant' physiological feelings. In less than twenty years, a detailed collection of scales to measure a host of personality attributes had been published, e.g. empathy scale, suspiciousness, fear of death, and conservatism (Sarason & Smith, 1971).

The wholesale uptake of the idea of stress-related anxiety is not to be underestimated. Patmore tells us that in the 1990s the World Health Organization (WHO) called the stress of everyday life 'a worldwide epidemic' (Weissmann, 2007) and in the USA, the stress management industry costs about $US18 billion per year (Weissmann, 2007).

While stress and anxiety and subsequent ill health links have been well established and researched for decades, the idea of the impact of stress on higher order cognitive functions, such as problem solving and learning, has only recently begun to be explored. In the next section I briefly examine the literature that has explored these links and then present key research that has examined the impact of stress on the learning abilities of medical students in particular.

2.2.2.2 Linking Anxiety and Learning

Once the link was established between stress and anxiety, it was only a matter of time before interest was aroused into the effects of anxiety on cognitive and intellectual performance (Sarason & Smith, 1971). Liebert & Morris (1967) see test anxiety (as in examinations) as composed of worry and emotionality. One of the constituents of worry alludes to student's insights and unease about performance, poor self-evaluation and consequences of behaviour. In examination situations the evaluation of one's performance can be judged as a threat to self-esteem. Highly test-anxious individuals are concerned with possible failure and self-doubt. Arguably, students worry about their performance and direct their attention to the way others see them, rather than thinking of the task in hand.

Anxiety states are known as subjective feelings of tension, apprehension, nervousness and worry and the activation and arousal of the autonomic nervous system is invoked (Spielberger, et al., 1983). Anyone reading this who has ever taken an exam, even when well prepared, will remember the feeling as they walked into the examination. The undermining effect of test anxiety on students is well documented (Sarason & Smith, 1971; Weinstein, et al., 1982; Wachelka, 1999; Yi-Chun, et al., 2007), and can cause poorer academic achievement (Yi-Chun, et al., 2007) and high levels of distress and academic failure in students who are usually competent and expected to succeed (Wachelka & Katz, et al., 1999). Although a little anxiety can be a good motivator, the effects of 'test anxiety' can enervate students to the point that their examination experience is unpleasant and unproductive. The impeding effects of anxiety on academic achievement are well documented (Weinstein, et al., 1982) and described in the next section.

2.2.2.3 Impact of anxiety on cognitive functioning of medical students

In medical education, high levels of anxiety in medical students may have negative effects such as influencing levels of cognitive function and performance, decision-making and the ability to care, thereby undermining learning and professional effectiveness (Driskell & Salas, 1996; Lehner, Seyed-Solorforough, O'Connor, Sak, & Mullin, 1997; Shapiro, Shapiro, & Schwartz, 2000; Smith, 1990). A systematic review published in 2000 identified a large body of evidence that reveals medical education itself has deleterious consequences, with studies identifying high levels of stress leading to alcohol and drug abuse, interpersonal relationship difficulties, depression, anxiety and even suicide (Shapiro, et al., 2000). One study has identified that medical students have mean anxiety scores one standard deviation above those of non-patients (Vitaliano, 1989). While over 600 articles were identified for the systematic review, only 24 had used an intervention and of those only 6 had rigorous study designs using either randomised or non-randomised controlled designs. There was a lack of a control group in most studies, few used validated outcome measures and sample sizes were small (usually less than 30 participants). The heterogeneous nature of the interventions implemented made drawing firm conclusions impossible. Despite this lack of evidence to support the effectiveness of most of the interventions, medical students participating in the studies overwhelmingly commented that the intervention (no matter what it was) should be implemented as a matter of course in all medical education programmes. The types of interventions included hypnosis and self-hypnosis, mindfulness meditation, support groups and stress management training (Shapiro, et al., 2000). None had tested an IPE intervention.

Many of the recommendations from the systematic review were similar to those made by Barr and colleagues reported elsewhere in this chapter. These included recommendations for more rigorous study designs with control groups, precise study of the varying durations and frequencies of interventions, measurement of moderator variables to determine what is best for whom, improving the specificity of outcome measures and including physiologic measures of stress to provide objective measures to complement self report (including EEG, ECG, BP, cortisol, measures of immune function, finger pulse transit time (FPTT) and ear pulse transit time (EPTT)); and finally

recommended follow up assessments including the effectiveness of future patient care (Shapiro et al., 2000). These recommendations will be reconsidered in the final chapter of this thesis. Of particular interest for the design of my study was the discussion concerning the limitations of self report measures which are open to response bias, social desirability bias, and unconscious coping (repression) bias, i.e. the finding of no reporting of anxiety despite physiological changes diagnostic of heightened anxiety (Shapiro et al., 2000).

2.2.3.4 Recent studies examining medical student anxiety

A recently reported study comparing the anxieties of medical students related to clinical training aimed to compare the anxieties of clerkships (placements in clinical settings) of students from two medical schools that applied two different preclinical curricula (Sarikaya, Civaner, & Kalaca, 2006). One school offered a problem-based curriculum, the other an integrated model. In order to evaluate perceived anxiety the researchers used a questionnaire consisting of 39 issues scored using a Likert-type scale. At the top of the list of 'sources of anxiety' students from both schools recorded they were fearful of making mistakes that could harm patients. Students from the school in which they received no pre clinical training in basic and communication skills (the integrated model) expressed additional anxieties related to clinical skills such as suturing, taking blood and giving injections.

One of the many limitations of the study is that the validity of the questionnaire was not tested. It was adopted from one used in an earlier study by Moss and McManus (1992) at St Mary's Teaching Hospital, London.

Students were also asked to identify 'Stress items' from a list of eight that had previously been described as stressful by medical students in a pilot study viz: Relationships with academic staff; relationships with consultants; relationships with ward staff; physical examinations of patients; talking with terminally ill patients; too much responsibility; too little responsibility and/or effects on personal life (Sarikaya, Civaner, & Kalaca, 2006).

Firth (1986) describes the findings of a longitudinal study of stress experienced by medical students and considered whether these differed from those in certain other populations and between men and women. Her findings were similar to earlier work that found the prevalence of psychiatric symptoms in medical students to be higher than that in the general population (Firth 1986). Firth found the estimated prevalence of emotional disturbance in the students reflected earlier reports that 15-26% of students were in need of some kind of treatment (Firth 1986). The students Firth studied were about to commence their psychiatric clerkship. While any clinical placement will bring with it its own distinct stress; talking to patients was regarded as the most stressful with 90% scoring high on this item.

The literature reveals many studies involving stress and anxiety amongst medical students; from 1st year to final and 'clinical' year. Most of the studies are qualitative, that is, descriptive and involving small numbers of students. For example, Radcliffe and Lester (2003) explored the views of 21 fifth year medical students at the University of Birmingham, UK, on the causes of stress throughout their undergraduate medical training. Stress causes the feelings of anxiety, which in turn cause poor performance and according to Pugh and Salud (2007) medical students experience a substantial amount of discomfort during their training.

One of the areas of great stress is the performance of an intimate examination, which in Pugh and Salud's (2007) study, was the clinical breast examination (CBE). The study was embedded in the curriculum for the female CBE, and its purpose was to identify sources of anxiety for 2nd year medical students learning CBE. Breast training sessions were taught over a four-day period involving approximately 40 – 45 students. Prior to the intervention, the course involved students watching a video on how to perform female CBEs then participating in small group training sessions with paid patient instructors (PPI). These instructors model patients, except they are trained to instruct students how to perform a proper exam and provide feedback; they have normal anatomy and a physician is not usually present when they are training the students. The intervention took place after the video and before the paid patient instructors (PPI), and consisted of four training stations using simulated breast models (Anatomy station – two simulated breast models, one pre and one postmenopausal; Pathology Station – two

breast models with interchangeable masses; Breast Palpation Technique station; Breast surgery video station of procedures being performed), visual aids and anatomy quizzes. Surveys were developed to determine medical student anxiety and comfort levels when learning specific aspects of the female CBE. Three separate focus groups consisting of course instructors, medical students and PPI's were used to generate items for the survey. The first survey had two parts. Part one assessed student state anxiety although there is no reference for the instrument used to measure the state anxiety. The second part of the survey assessed student comfort when learning specific aspects of the CBE.

The researchers noted, "...since anxiety and comfort are closely related and many dictionaries, including the American Heritage (Fourth Edition), define "uncomfortable" as "causing anxiety" we accepted that there may be overlap in the students' indication of comfort and anxiety. Thereafter the term "comfort level " is interchanged with anxiety; and "the effect of anxiety on comfort levels" (Pugh & Salud 2007, p767). Fifty percent of students chose 'Fear of missing a lesion' as their number one cause of anxiety, and was the most frequent response chosen by the students. 23% chose the intimate/personal nature of the exam. After the intervention student comfort levels were significantly raised (Pugh & Salud 2007).

This study highlights the challenges medical students (and others) face when first encountering the intimate nature of caring for most patients but particularly women during pregnancy, childbirth and early infant care and breastfeeding. Intimacy with women in labour ward work is continuous; for example, when I introduce myself to the woman, my script usually contains something like, "Hello, my name is Catherine, I am your midwife for the day. We have to become good friends because I am going to do things like feel your tummy/may do a vaginal examination/check your pads and look at them, smell them". Intimate examinations are part of labour ward work and although they are done every day we do keep in mind the fact that women often find things we do to them embarrassing, uncomfortable and sometimes painful. Vaginal examinations, perineal repairs, breasts checked and babies placed upon them - for many women, these are personal and private activities; for 4th year medical students seeing these for the first time could also make them feel anxious and embarrassed.

2.3 Can the student's clinical placement in Labour Ward be likened to a test/exam?

The clinical placement that the students in my study undertake, that is Labour Ward, is a stressful experience that can be likened to a test. During the course of their medical training students encounter numerous stressful work environments (and tasks, for example, intimate examinations) including Emergency Room and Labour Ward, which can result in higher than average rates of depression and anxiety than in the general population (LeBlanc & Bandiera, 2007). Clinical placements in these areas form an intrinsic part of the student training. Emergency medicine and labour ward are medical sub specialities where students are exposed to high stress situations.

In a repeated measures design study by LeBlanc and Bandiera (2007) two examinations, matched for difficulty and length, were constructed based on the performance of 23 residents in two Royal College of Physicians and Surgeons of Canada (RCPSC) Emergency Medicine residency programmes. These examinations were then administered at 2-week intervals to another 24 residents in two additional RSPSC Emergency Medicine programmes. One examination was administered under high stress conditions (in-training examination) and the other under low – stress (control) conditions. Perceived anxiety was measured using the state scale of the State-Trait Anxiety Inventory (STAI) before and after each part of the examination (LeBlanc & Bandiera, 2007).

The objectives of this study were: to measure the subjective anxiety felt by emergency medicine (EM) junior residents during in-training examinations and, to determine the effect of this anxiety on their ability to diagnose visual stimuli such as X-rays, photographs and electrocardiographs.

The participating emergency medicine residents were required to answer written questions regarding a series of visual stimuli (electrocardiograms, (ECG's) photographs, X-rays) during a high-stress in-training examination and during a low-stress control condition. The researchers chose to investigate emergency medicine residents visual diagnostic abilities for several reasons. First reason given was that EM is a medical sub-speciality in which doctors must correctly recognise clinical features, reach a correct diagnosis, and make accurate treatment decisions in what are often time

–pressured, challenging circumstances. Secondly, the task is a true to life one, and the participants were familiar with interpreting and making decisions based on ECG's and X-rays; the consequences of poor performance are costly. In both the Emergency department and Labour Ward, poor performance can lead to worsened patient outcomes, and possibly death.

A paired T test on the STAI (state) score revealed no significant differences between the scores prior to and after each examination session (p= 0.57). Overall, the residents reported experiencing greater anxiety during the high-stress examination condition (mean 41.5, SE 2.2) than in the control examination condition (mean 35.9, SE 2.2). The pattern of increased anxiety scores was the same across the different levels of residency training. All residents, regardless of their level of training, reported higher levels of anxiety in the high-stress examination condition; anxiety scores were not significantly correlated with performance scores, and interestingly, examination scores were higher in the high-stress examination condition (LeBlanc & Bandiera 2007).

"The debilitating effects of test –taking anxiety on academic performance have been amply documented" (Weinstein, Cubberly, & Richardson,1982, p107). The view put forward by Wine (1980 in Weinstein, et al., 1982) embraces the view of test anxiety consisting of 'Cognitive–attentional' test anxiety. According to this view, test anxiety consists of more or less intense cognitive 'worry' that causes learners or test takers to divide their attention between task relevant activities and self oriented worries about themselves and the quality of their performance, thereby undermining effective learning or performance (Weinstein, et al.,1982).

The clinical placement in a labour ward forms an integral part of a medical student's continuous assessment, and completion is required in fulfilment of Clinical Core Competencies in many university curricula. Attendance is generally compulsory and students are required to perform to the satisfaction of the Labour Ward midwives/supervisors. Since the literature has revealed that students worry about their performance and direct attention to the way others see them, it is not inconceivable that students may regard the clinical experience placement, where their behaviour, skills

and attitudes are under the constant surveillance of staff who can 'pass or fail' them, as stressful as taking an exam.

In addition, given that labour ward is a 'sexually orientated[9]' department, it follows that some students will be nervous, apprehensive, embarrassed or all of these in this clinical placement as the notion of intimate examinations is clearly evident. In areas of sexuality, often referred to as 'sensitive examinations' i.e. vaginal exams or taking sexual history, medical students, along with other health care providers, can hold negative attitudes in relation to human sexuality, including reproductive sexuality (Dixon-Woods, Regan, Robertson et al., 2002). In a before and after study conducted at Leicester-Warwick medical school in the UK, students in a four year graduate course and second year students in a direct entry course were exposed to an integrated Human Sexuality study module designed to initiate the early process of reflection and recognition of how attitudes and values might influence their care of patients. The module included techniques of desensitisation, problem solving and reflection, using an assortment of teaching and learning strategies, mixing peer learning, self-directed learning and small group learning with whole class learning. The course was successful in reducing students' anxieties about human sexuality and improving their confidence in developing appropriate skills; 84% agreed the course had made them more sensitive to the needs of patients in relation to human sexuality (Dixon-Woods, et al., 2002).

Medical students associate stress with academic components such as assessments and feel stress during their move from academic/classroom studies to clinical work (Abraham, Chapman, Taylor, McBride, & Boyd, 2003). The specialty of obstetrics and gynaecology, at some stage, involves students undertaking intimate gynaecological examinations of women, and whilst teaching the student to be sensitive to the feelings and needs of women are paramount, students also can feel anxious whist learning and acquiring these skills. Entwhistle (1998 in Lonka, et al., 2008) emphasised that the environment in which learning takes place can impinge on the student's ability to learn. It does not take a leap of faith to conclude that some medical students, entering the labour ward for the first time to watch and help a woman having her baby, with its

[9] I use this terminology since birthing is bound up with human sexuality, body boundaries, sexual intercourse, genitalia, and intimacy.

sometimes subdued lighting and warm air heavy with distinctive smells (Aziz, 1999) may be feeling anxious or apprehensive.

2.4 How can anxiety be measured?

There are several well-validated tools that measure anxiety. These include well-known and used self-report tools such as the Beck Anxiety Inventory (BAI), the Spielberger State-Trait Anxiety Inventory (STAI) and the Visual Analogue Scale (VAS) (Dennis, Boddington, & Funnell, 2007). There are also less well-known tools such as the newly developed MED NORD – a tool for assessing medical student's wellbeing and study orientations. While addressing the issues of stress and exhaustion on learning, the tool is still being refined and further validation studies in diverse populations are needed before it can be generally applied (Lonka, et al., 2008). For this study I have elected to use the Spielberger State and Trait Anxiety inventory and I outline its key features in the next section.

2.4.1 The Spielberger State and Trait Anxiety Inventory

The STAI is a validated tool for measuring anxiety levels in 'college students' and particularly for students prior to, and after taking exams. Spielberger (Spielberger, et al., 1983) defines trait anxiety (T-anxiety) as "...relatively stable individual differences in anxiety prone-ness" (p5). State anxiety (S-anxiety) "...assesses how the respondents feel at the moment or felt in the recent past, or how they anticipate their feeligs in a specific situation that is likely to b encountered in the future..." (Kval, Ulstein, Nordhus, & Engedal, 2005, p629).

The STAI is 40 item, self-administered tool. Twenty questions assess State (transient) anxiety and 20 questions assess Trait (enduring) anxiety (Kvaal, Ulstein, Nordhus, & Engedahl, 2005). Kvaal et al., (2005) report that there is "...strong psychometric support for the STAI with younger adults" (p629). The STAIT, when used with heterogeneous communities, has adequate internal consistency and convergent validity. Therefore the STAI appears to be a highly appropriate choice of a well-validated tool for the measurement of anxiety in my study.

2.5 Summary

This chapter has outlined the key features of the research literature that provided guidance on the design of this study. The literature reported here is a small sample of the many articles located on the broad topic area of interprofessional education and the role of anxiety and learning. Most of the literature concerning IPE is descriptive with little in the way of robust evidence to support the claim that IPE improves health outcomes in patients. Similarly, very little evidence exists that IPE improves the outcomes for learners. These findings add weight to the focus of my study on the anxiety of medical students in a stressful clinical learning environment. Further, a justification for the choice of the STAI for this study of medical student anxiety and the role of IPE has been made. In the next chapter I outline the study design.

Chapter 3: Study Design and Method

The focus of this research project is the impact of Interprofessional Education (IPE) on medical student anxiety and learning experiences in maternity care. In this chapter I describe the study design and briefly discuss why a randomised controlled trial was not feasible in this instance. I will provide a rationale for the chosen design of a quasi-experimental study; describe the IPE intervention which was administered, the population studied, the data collection tools, methods of data collection, the pilot study undertaken, the proposed data analysis strategy and the ethical issues involved in this study, including my role as provider of the intervention and researcher.

3.0 Study Aims

This study aims to assess the effectiveness of two models of IPE by comparing the expectations and experiences of medical students who receive formal IPE (described below) compared with those who receive informal IPE support during their labour ward clinical experience. The study will focus on whether student anxiety is reduced and opportunities for clinical learning are enhanced when their experience is facilitated by formal IPE.

3.1 Study Design

The study employed a quasi-experimental design. Two groups of medical students from one university were enrolled in the study. One group received an IPE intervention (called IPE1, described below) during their one-week clinical placement in a labour ward. The second group acted as a control group and received the 'usual' facilitated educational experiences that most medical students in Australia receive during their one-week clinical placement in labour wards (called IPE2, described below). Students self selected the location for their clinical experience prior to enrolment in the study. IPE1 was only provided in one of three clinical placement locations (known as 'J Hospital'). IPE2 was provided in the other two sites (known as 'G Hospital' and 'M Hospital').

The level of anxiety and expectations of the clinical placement was assessed for all students using a 'Before' survey administered immediately prior to their clinical placement (Appendix 2). Following their clinical placement, the students' level of anxiety was again assessed and a description of their experiences obtained using an 'After' survey (Appendix 4). In addition, students completed a Clinical Experience Logbook (CEL, Appendix 3) to provide additional information about the kinds of experiences to which they were exposed and their reflections on those experiences. The primary outcome of interest was the change in the students' level of anxiety. Figure 1 below provides a flowchart of the study design including data collection points.

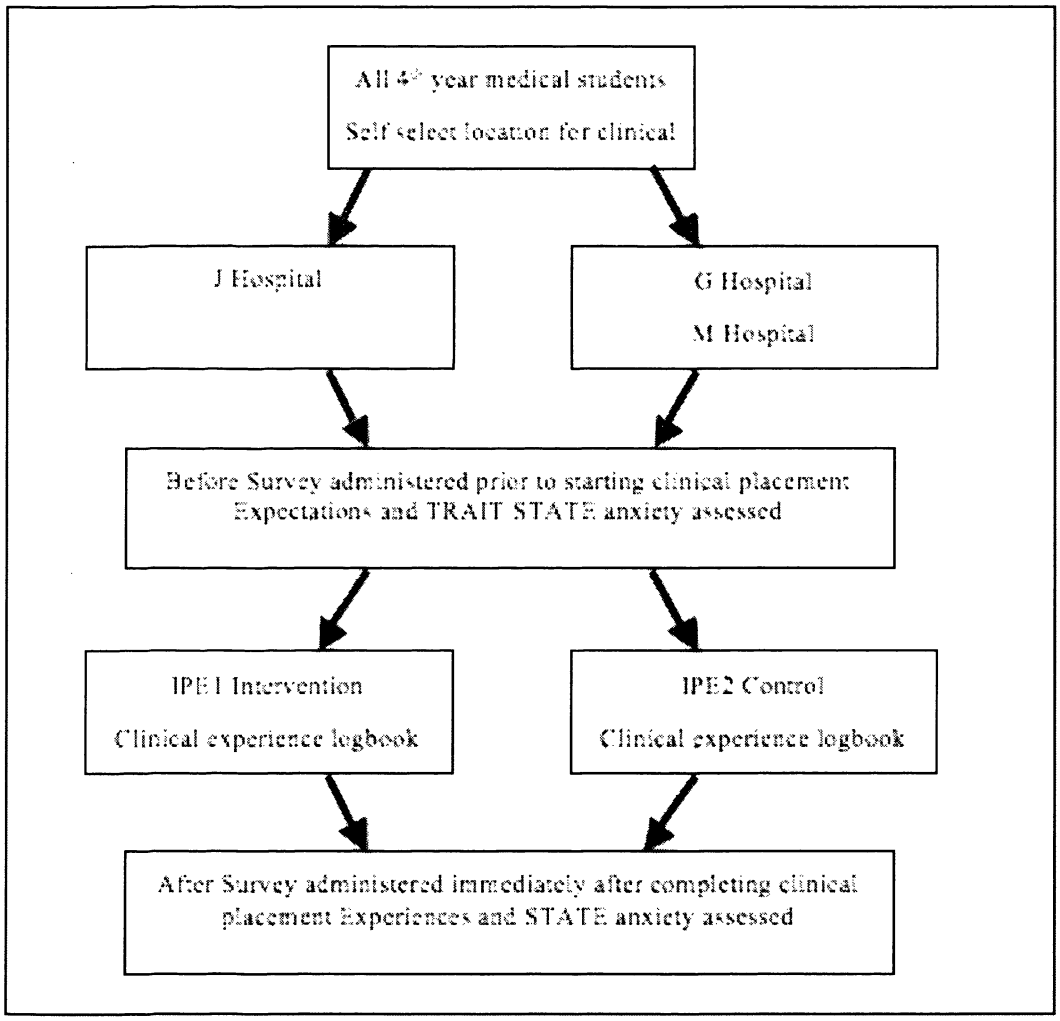

Figure 1: Study Design Flowchart

3.1.1 Choice of study design

Testing the effectiveness of an intervention is a problem best assessed using the randomised controlled trial design. This is because random allocation to intervention or control groups ensures that unknown characteristics of the population that might influence the outcome, are randomly and evenly distributed between the two groups and are unable to influence the outcome in an unbalanced way. While a randomised controlled trial may be the most appropriate research design with which to investigate the issue of concern in this study, it was simply not feasible to randomly allocate students to different locations for their clinical experiences in this university context. Some students choose the location for their labour ward clinical experience depending on their preferences, personal circumstances or geographical location. Therefore the study used a quasi-experimental design with non-random allocation to the intervention and control groups. The limitation of the quasi-experimental design is the possibility that students with particular characteristics, which are related to their underlying levels of anxiety, may choose particular locations for their clinical experience. This may influence the outcomes of the study. Examining the student demographic characteristics and baseline anxiety levels assessed in the 'Before' part of the study enables further exploration of this issue.

3.2 Definitions of Formal and Informal IPE used in this study

One key definition of Interprofessional Education (IPE) is when "...members (or students) of two or more professions associated with health or social care [are] engaged in learning with, from and about each other " (Barr et al., 2005 p.xxiii). This definition describes the processes of both formal (IPE1) and informal (IPE2) Interprofessional Education in this study.

During the course of their clinical educational program, medical students are required to spend time in a labour and delivery unit, to observe and develop an understanding of the physiology of pregnancy, labour and birth and the care of women during childbirth. For the purposes of this study, two forms of support are provided to medical students depending on the location for their labour and delivery unit educational experience. The two forms of support are called Formal IPE1 which is the intervention applied in this

study and Informal IPE2 which is the control. These are each described in detail in Table 1, below.

Table 1: Characteristics of Formal IPE1 (intervention group) and Informal IPE2 (control group)

Formal IPE1 = Intervention	Informal IPE2 = Control
Employs a specific mentor midwife to formally facilitate student learning.	Midwives caring for women provide informal support for any medical student who has been allocated to their unit.
The mentor midwife provides an orientation to the unit and the work involved. This includes introducing the students to other staff members, showing them the location of the tea room and where to keep their belongings.	The student does not routinely receive formal orientation to the unit.
The students are required to attend the labour ward according to a rotating roster.	The student attends the labour ward at any times that he/she plans as there is no timetable provided.
The mentor midwife invites the student to actively participate in the care of women in conjunction with the mentor midwife.	The student is generally left to initiate learning opportunities by seeking engagement with staff opportunistically.
The mentor midwife is allocated a specific woman or women to care for over the next 8-12 hours. The mentor midwife ensures that the student is introduced to the labouring woman and her supporters, understands what aspects of care he/she may provide and assists the student to provide as much care as possible -always under supervision.	The amount of support received is dependent upon student's ability to interact with staff members and ask for assistance to meet their learning goals, or is dependent on proactive midwives offering assistance and inviting them to participate in the care of women.
The mentor midwife is aware of the learning goals the medical student is expected to meet during the clinical placement and has also participated in other classroom teaching/learning sessions with students during the 'Reproductive Medicine' term.	The student's learning is dependent on the workload on the unit at the time and the willingness or interest of the midwives to work with medical students.

3.3 Study Locations

Students undertake their clinical experience in one of three potential locations, which are clinical sites for the University of Newcastle's medical student education program. Each location has a number of characteristics that may influence their expectations and experiences and levels of anxiety or comfort. The characteristics of the three locations are described in Table 2. The hospitals have been de-identified using letters to maintain confidentiality.

Table 2: Locations for medical student labour ward clinical experience and IPE model

Hospital	Demographic characteristics*	Model of IPE available
J Hospital	Tertiary referral hospital level 6, with 3,942 births per annum	Formal IPE
G Hospital	Regional referral hospital level 5 with 2,426 births per annum	Informal IPE
M Hospital	Rural referral hospital with 1,534 births per annum	Informal IPE

*(NSWHEALTH, 2007)

3.4 Study Population

The study population are 4th year undergraduate medical students at the University of Newcastle, NSW who were undertaking their term in 'Reproductive Medicine' from June 2008 – June 2009. This numbers around 100 students. In addition 48 students undertaking their course between February 2008 and May 2008 were invited to take part in a pilot study, which is described briefly below.

Unlike some other postgraduate, medical education programs in NSW, and the rest of Australia, the University of Newcastle offers an undergraduate medical degree. Students are a mix of recent high school graduates and those who may have undertaken other courses of study or work/life experiences before being accepted into the undergraduate medical education program. Many students are of a mature age and may have children of their own. Typically student ages range from 21 to 43 years. Therefore the results of this study will be applicable to medical students in similar undergraduate programs and to those who are of similar demographic characteristics.

3.4.1 Sample size and power

Since the entire population of medical students was invited to participate in the study there is no need to consider the issue of sampling or sample size. However in order to have confidence in the findings of the study I needed to consider the issue of statistical power.

In order to have 95% confidence (+/- 5%) that the results from a sample of the population of 100 students is reliable I needed to have at least 80 students complete the survey (Raosoft, 2004).

3.5 Data Collection Tools

3.5.1 Before survey

A survey assessing student expectations was administered to the total population of 4th year medical students before they undertook their clinical experience in the labour ward at the three sites. The survey was based on one used in a study conducted in Victoria by Quinliven and colleagues (Quinliven, et al., 2003). Some slight modifications in terminology were made to the survey tool together with the inclusion of an assessment of anxiety using a validated instrument, the Spielberger State and Trait Anxiety Inventory (STAI) (Spielberger, et al., 1983). Demographic and other potential explanatory variables (e.g. whether the student had observed or experienced childbirth previously) were also assessed. A copy of the tool is provided in Appendix 3. A detailed description of the Spielberger State and Trait Anxiety Inventory has been provided in the preceding chapter. The key issue of relevance here is that the STAI is a well validated tool that has been used in many studies assessing anxiety and in particular in studies of student anxiety – so it is an appropriate tool for measuring the primary outcome in this study.

3.5.2 A Clinical Experience Logbook (CEL)

The CEL was provided for each student to record the range and number of clinical experiences they had during their clinical placement in labour ward. The CEL provided an indication of the kind of learning experiences to which the student was exposed. The CEL is not individually identifiable. Both the questionnaires and CEL were linked via a

numerical identifier. The CEL was originally developed by the university to provide a formal record of the required number of births and procedures students were expected to perform. However at the University of Newcastle the number of births a student attends is no longer mandatory so the CEL had ceased to be used routinely. It is included in this study to provide both quantitative and qualitative perspectives on student experiences. The CEL was modified to focus on whether the student participated in the care of women experiencing a normal labour and birth; and then what experiences of labour interventions they may have had. Completion of the logbook also encouraged students to reflect upon the care given to labouring women, which may increase their learning. It may also improve their understanding of what it is midwives do, and the nature of teamwork. A copy of the CEL is provided in Appendix 4.

3.5.3 After survey

A second survey was administered to the same participants after completion of their clinical placement to provide a description of their clinical experiences, level of anxiety, and other potential explanatory variables (such as location for their clinical experience and whether formal IPE1 or informal IPE2 was provided). A copy of the After Survey is provided in Appendix 5.

Questionnaires and CEL were returned via a pre-addressed envelope and the internal hospital mail systems.

3.5.4 Development of the survey tools

The Before and After surveys were developed following an examination of those used in the study by Quinliven, et al. (2003). For the Before survey, additional questions were chosen to assess items that may have an impact on student anxiety and to reflect the range of experiences to which they may be exposed. The After survey asks questions that seek to focus the students' thinking on the professional relationships they experienced.

Both surveys and CEL were piloted with a group of five medical students who were participating in their Reproductive Medicine term at the time. They were asked to comment on the amount of time it took to complete; the ease of completion;

appropriateness of the questions and any other issues of concern that they wanted to raise in relation to the tool. Slight modifications were made to the order of questions and the terminology following their feedback. The students found the CEL to be a useful record of what they had done during their clinical experience. A requirement for a midwife or doctor to sign entries on the CEL was added in order to validate the record.

3.6 Procedure

All students attended an orientation to their Reproductive Medicine term. During their orientation to the term, time was made available for a research assistant to explain the research and invite students to participate. Packages containing the information sheet (see Appendix 2), the Before and After surveys, the CEL and addressed envelopes for returns, were made available in the lecture theatre and students wishing to participate were invited to take them. Participating students were invited to complete the Before survey at the end of the orientation lecture and to post the completed survey in a box provided in the lecture theatre.

Participating students were then asked to complete the CEL during their time in labour ward whenever they were involved in some form of care for a woman or baby. They were instructed to complete the After survey at the end of their clinical experience and return in the envelope provided together with their completed CEL.

Academic and administrative staff reminded students to complete the surveys when they attended reproductive medicine lectures or tutorials.

3.7 Data Analysis

Data from the surveys were entered into an Excel spreadsheet for analysis. Simple descriptive statistics were used to describe the population demographics and a 2-tailed Student's t-test was used to determine whether differences in the demographics and Before 'Trait' score and the Before and After 'State' Anxiety scores for intervention and control groups were statistically significant. Comments added to the surveys were analysed using thematic content analysis. The CEL was analysed using descriptive

statistics for numerical data and simple thematic content analysis of reflections and/or comments provided.

3.8 Ethical issues

Two key ethical principles need to be addressed in this study. The first is the issue of non-coercion. Participants must be provided with sufficient information to make an informed consent to participate in research. They need to know that they do not have to participate and that their participation is entirely voluntary and that they may withdraw at any stage. This is somewhat easier with a study requiring completion of a questionnaire since the participants may simply not complete it or not return it once completed, if they decide they do not wish to participate. However, since I am one of the clinical lecturers in the medical faculty and am actively involved in the provision of formal IPE1 in one location, a person who was not involved in the research was appointed to invite students to participate and explain the study in order that students did not feel coerced into participating.

The second is the issue of anonymity or non-identifiability. Participants were not asked for any identifying information so their responses are not identifiable. However in order to be able to link Before and After surveys the location for the clinical experience needed to be identified. This might have made possible the identification of respondents. Any potentially identifiable or re-identifiable information was kept confidential to the researcher. Each Before and After survey was coded so the surveys could be matched for analysis.

Ethical approval was sought from the University of Newcastle Human Research Ethics Committee. Following removal of the requirement for consent and the removal of the offer that students may keep their CEL (as it is data), the study was approved. A copy of the approval letter is located in Appendix 1.

3.9 Pilot Study

A pilot study was undertaken to test the recruitment, survey administration and data analysis processes. A total of 48 students enrolled between February 2008 and May 2008 were approached and agreed to participate.

3.9.1 Reflections on the Pilot Study

Several issues were identified during the pilot study that needed to be modified before commencing the formal study and data collection. These included:

1. Attempts to improve the response rate through telephoning and reminding lecturers in each location to remind the students.
2. Personal visits by the researcher to the sites to encourage the students to complete the surveys.
3. The dark green paper was not easily read, therefore this was changed to light green (coloured paper was used to reduce the impact of "boring white paper" – an initiative to try to improve the response rate).
4. Decision to leave out one regional hospital that was initially planned to be included as the geographic distance meant the researcher could not easily reach the hospital to ensure recruitment and follow up and there was no consistent person employed to act as a research assistant on site.
5. The CEL was not completed by many students at all, therefore this component of the study needed be to emphasised when introducing the study and in follow up reminders to clinical lecturers.
6. A major mistake was identified regarding the use of the State and Trait surveys. The After survey requires the student to complete the State Anxiety Inventory instead of the Trait. I had put in the Trait tool. This error was rectified for the main study.

3.10 Summary

This chapter has provided a detailed description of the quasi-experimental design chosen to assess whether a formal programme of IPE had an impact on medical student anxiety during their clinical placement in labour ward. A description of the intervention IPE1 has been provided and it was compared with a description of the routine model of IPE2 provided to students in the control group. Methods of data collection and analysis and the ethical issues, associated mainly with recruitment and the non-identifiability of participants, have also been detailed. The next chapter provides the results of the study.

Chapter 4: Results

4.0 Introduction

This chapter describes the results of the study. The results are presented only for students who completed both Before and After surveys. The chapter is divided into three sections. Section one provides the demographic details of the students in each group. This section also presents the student expectations as described in the Before survey. Section two reveals the description of the student experiences as reported in the Clinical Experience Logbook (CEL). This section also presents the students' perceptions of their clinical experience as presented in the written comments on the free text sections of the After survey. Section three provides the detailed analysis of the student anxiety levels as assessed by the STAI anxiety tool and reveals the difference between their Before and After scores. The results are presented as responses to four questions; who participated in the study; what were their expectations; what was their experience; and what was their anxiety level before and after the experience?

4.1 SECTION 1

4.1.1 Who were the students who participated in the study?

Over the course of the 2008 academic year, 105 students were invited to participate in the study. Seventy students accepted the invitation to participate; a response rate of 66.7%. There were 44 students in the IPE1 group and 26 students in the IPE2 group. The detailed description of IPE1 and IPE2 is found in chapter three (Study Design and Method). Table 3 below describes the demographic characteristics of the students who completed both Before and After surveys. This includes demographic variables such as age, gender and ethnicity. Variables such as Religion and Place of Birth were included since a large proportion of the student population are from ethnic minority groups in Australia.

There was no significant difference between students in IPE1 and IPE2 on any of the demographic variables. A Student's t-test was used to test the difference between groups in age and Fisher's exact test (as the cell sizes were small) was used to test the difference between groups for other categorical variables. Where there were more than

2 levels within categories (i.e. Religion, Place of birth, etc) the data were combined into 2 groups before Fisher's Exact Test was performed.

Table 3: Demographic details of participants in IPE1 and IPE2 who completed both Before and After surveys (Questions 1-12).

Demographic variable	IPE1 (n=44)	IPE2 (n=26)	Significance
Age Mean SD	24.5 4.1	25.6 5.4	$p > 0.05$
Gender n (%) Male	28 (63%)	14 (53%)	$p > 0.05$
Religion n (%) Christian Islam None Other	 15 (31%) 9 (20%) 14 (31%) 6 (18%)	 12 (46%) 1 (3%) 12 (46%) 1 (3%)	$p > 0.05$
Place of birth n (%) Australia Malay UK Chinese	 17 (38%) 14 (31%) 4 (9%) 7 (15%)	 22 (84%) 1 (3%) 0 2 (7%)	$p > 0.05$
Ethnicity n (%) Caucasian Asian (Chinese, Korean, Indian) Malaysian Other	 20 (45%) 7 (16%) 9 (20%) 8 (18%)	 18 (69%) 2 (8%) 2 (8%) 4 (16%)	$p > 0.05$
English is first language	26 (59%)	21 (80%)	$p > 0.05$
Aboriginal & Torres Strait Islander	1 (2%)	1 (4%)	$p > 0.05$
Family Status Single	26 (59%)	16 (61%)	$p > 0.05$
Have children of my own	1 (2%)	3 (12%)	$p > 0.05$
Planning to have children	35 (79%)	16 (69%)	$p > 0.05$
Considering a career in obstetrics	17 (38%)	12 (46%)	$p > 0.05$
Importance of this placement to your chosen field	21 (47%)	15 (57%)	$p > 0.05$

*Note: Some of the percent values in categories do not add up to 100% due to missing responses (e.g. Place of birth).

4.1.2 What were the students' expectations of their clinical experience placement?

Question 13 on the 'Before Survey' endeavoured to ascertain students' expectations of their clinical placement in the labour ward. Table 4 indicates that students in both IPE1 and IPE2 were similar in terms of their expectations on each of the items listed with the exception of one part (Part 16) which asked whether undertaking a perineal repair was anticipated. While fewer than half the students in either IPE1 or IPE2 anticipated they would be undertaking a perineal repair, there was a statistically significant difference found, with less students in the IPE2 group reporting that they felt they anticipated having this experience.

Table 4: Student responses to the question: 'What do you anticipate you will experience in the Delivery Suite?'

Anticipated Experiences		IPE1 (n=44)	IPE2 (n=26)	Significance
1	Seeing a baby being born	100%	100%	$p > 0.05$
2	Helping a woman during labour & birth of the baby	86%	77%	$p > 0.05$
3	Managing women in pain	68%	65%	$p > 0.05$
4	Seeing women having a caesarean section	98%	88%	$p > 0.05$
5	Observing the role of the doctor	98%	92%	$p > 0.05$
6	Observing the role of midwives	95%	96%	$p > 0.05$
7	Working with midwives	93%	96%	$p > 0.05$
8	Being part of the team	91%	100%	$p > 0.05$
9	Recording in the case notes	68%	58%	$p > 0.05$
10	Learning about documentation such as the partograph	82%	85%	$p > 0.05$
11	Using equipment such as the CTG (fetal) monitor	89%	92%	$p > 0.05$
12	Learning to interpret CTG traces	91%	85%	$p > 0.05$
13	Undertaking vaginal examinations	80%	85%	$p > 0.05$
14	Undertaking physical assessments of women during labour and childbirth	93%	100%	$p > 0.05$
15	Undertaking an episiotomy	48%	35%	$p > 0.05$
16	Undertaking perineal repair	45%	12%	$P = 0.0038$
17	Observing instrumental births	91%	88%	$p > 0.05$
18	Observing obstetric emergencies	91%	92%	$p > 0.05$
19	Assisting in the management of obstetric emergencies	61%	50%	$p > 0.05$
20	Assisting women with breastfeeding their newborn baby	45%	46%	$p > 0.05$

21	Talking with the woman's partner and family	93%	92%	$p > 0.05$
22	Learning more about the anatomy of the pelvis and the pelvic floor	95%	100%	$p > 0.05$
23	Learning more about the presentation and lie of the fetus	98%	100%	$p > 0.05$
24	Mechanisms of normal labour	95%	100%	$p > 0.05$
25	How to identify when labour is not progressing normally	100%	100%	$p > 0.05$
26	Learning about shift work and how to be awake in the middle of the night	68%	50%	$p > 0.05$

4.1.3 Student Comments on Their Expectations

Very few students wrote comments but of the 11 comments provided, two themes were identified. The first was the theme of 'positive anticipation'. This is illustrated by the following comment:

> "Looking forward to a new experience! Hopefully everything will be good and I hope that I can learn and enjoy myself as much as I can ☺" (IPE1).

The second theme was of 'wanting hands on experience' as illustrated by the following comment:

> "I hope to deliver a baby, not just see one born" (IPE2).

One student in particular wanted to learn more about postgraduate opportunities in obstetrics:

> "Learn about post graduate opportunities to learn more about O+G e.g. short courses for GP's to learn how to do forceps-assisted deliveries" (IPE1).

4.2 SECTION 2

4.2.1 What were the students' clinical experiences?

A total of 48 clinical experience logbooks (CEL) were returned (IPE1= 33/44 – 75% response rate, IPE2=15/26 – 57% response rate). One CEL from IPE2 was returned blank leaving only 14/33 useable CEL's from this group. Extracting data from the CEL was challenging as the identifying medical record numbers for each case were most often omitted. Therefore it may have been the case that experiences were entered in both the normal birth experience section and in the complex birth experience section and could have been double counted. Few students gained the signatures of the midwife or doctor with whom they were working so the data could not be verified. Table 5 describes the average number of clinical experiences recorded in the logbooks from each group. This indicates there was a similar range and volume of experiences except for a larger exposure to caesarean births for the IPE2 group. All students recorded that they had experienced women having spontaneous vaginal births except for one student from IPE1 who recorded he had witnessed no spontaneous births during his clinical experience but had seen one vaginal birth by ventouse extraction.

Table 5: Average number and type of clinical experiences in each location

Mode of birth	IPE1 Average per student		IPE2 Average per student	
	N	Mean	N	Mean
Vaginal birth	69	2.0	30	2.1
Instrumental	14	0.4	9	0.6
Caesarean	26	0.78	30	2.1
Complexity	36	1.0	15	1.0

4.2.2 Themes arising from student comments in the After survey

Thematic content analysis of the comments made in the free text section of the After surveys revealed four similar themes in each group and one further theme identified in the IPE2 group. The four themes are: 'regard for midwives'; 'regard for the clinical experience'; 'belonging to my tribe'; 'more hands on' and 'the turf war'. In the next section I briefly describe each theme and provide an illustrative quote from the students

from either group. The additional theme that was identified in IPE2 concerns the conflict witnessed between midwives and doctors around what has come to be known as a 'Turf War' (Zwarenstein & Reeves 2000; Hastie & Fahy 2009; Salvage & Smith, 2000).

4.2.2.1 Regard for midwives

This theme reveals the students' regard for the midwives who provided them with access to women during labour and birth. In most cases, students provided positive comments such as:

> "Midwives were great teachers and guides. Indispensable in a good delivery suite rotation in terms of experience and learning's (sic)" (IPE1)

There were some cases where students had a less than positive experience and therefore regard for the midwives was illustrated by these comments:

> "I didn't know where equipment was & didn't feel useful when the midwives asked me to get equipment. I felt under pressure & stressed especially when midwives yelled at me to get equipment & for me to get out of the way" (IPE2)

> "midwives to be extremely unhelpful / bordering (sic) rude toward me. Some made you feel like a burden" (IPE2)

4.2.2.2 Regard for the clinical experience

Most students in both groups clearly enjoyed their experiences and many met their expectations for 'hands on' experiences as illustrated by the following quotes:

> "Being able to assist in even the little things was definitely much appreciated and I felt included" (IPE1)

> "Did lots of hands on with guidance from the midwife and doctors" (IPE2)

"I had a great time through my delivery suite rotation. Did lots of hands on with guidance from the midwife and doctors" (IPE2)

Some students however did not have an enjoyable time as evidenced by the following quotes:

"I'd be more comfortable with hands on delivery if I knew what to do in that position" (IPE1)

"Had to wait for hours to see the deliveries, probably we can go to other room as well if there are other women about to deliver their baby" (IPE1)

4.2.2.3 Belonging to the 'tribe of medicine'

A further theme suggested that several students would prefer to receive support from, and experiences with, doctors rather than midwives as revealed in the following quotes from students in both IPE1 and IPE2 groups. Students wrote:

"Shadowing registrars in managing complicated delivery was good as more teaching hands on experience if possible in a tutored doctor round" (IPE1)

"If someone is to introduce the student it should be the registrar or consultant not the midwives" (IPE2)

" I found it a lot easier to observe...in delivery if I was 'shadowing' the RMO compared to being with a team of midwives" (IPE1)

4.2.2.4 More 'hands-on'

Wanting more 'hands-on' clinical experience was the most common theme. For example, students wrote:

"It would have been better if I had had more hands on experience especially at the end of the week eg doing VE and doing the deliveries" (IPE1)

4.2.2.5 The Turf War

A theme emerged that revealed the students were very aware of the tension between the two professional groups involved in women's care, that is, midwives and doctors. For example, students wrote comments like:

> "It would have been better if both the doctors and midwives refrained from making negative comments about each other to medical students" (IPE2)

> "[they should] brief midwives to be more receptive. Most are great. Some get caught up in obstet VS midwifery" (IPE2)

The students may have perceived the turf war as personally directed toward them as reflected in the following comments that revealed some competition or preference favouring midwives over medical students for clinical experiences:

> "...midwifery students get much more preference" (IPE2)

> "Midwives were very helpful when no other midwife students present. When other midwife student present, med students become invisible" (IPE2)

> "[I] experience difficulty [when] competing with midwifery students" (IPE2)

4.3 SECTION 3

The main outcome of interest in this quasi-experimental study was the impact of IPE1 on the anxiety of the medical students. In this final section I examine the scores on the Speilberger STAI scores Before and After their clinical experience. The difference was statistically significant as indicated in Table 6 and illustrated clearly in Figure 2.

4.3.1 What was the level of student anxiety before and after their clinical experience?

Table 6 reveals that students in IPE1 and IPE2 did not differ significantly on their baseline STAI score at the Before test (IPE1 STAI-39.1, IPE2 STAI -37.6). However at the After clinical experience assessment of their anxiety as measured by the STAI, students in IPE1 had significantly reduced STAI scores.

Table 6: Average STAI score for IPE 1 and IPE 2 at Before and After clinical experience.

	Before	After	Difference Before - After
IPE 1			
Mean	39.1	32.6	-6.5
SE	1.4	1.2	1.7
			p = 0.0003
IPE 2			
Mean	37.6	38.4	0.8
SE	1.6	2.0	2.1
			p = 0.7000

There was a significant decrease in the STAI score for the IPE1 group from Before to After periods (p = 0.0003). For the IPE2 group, there was no significant change in STAI score from Before to After (p = 0.7000).

Figure 2 illustrates for the Before clinical experience phase scores the standard errors for IPE1 and IPE2 overlap, which indicates that there is no difference in the STAI score between the groups at this time. In the After clinical experience phase, the standard errors do not overlap, which indicates that there is a significant difference between the two groups at this point.

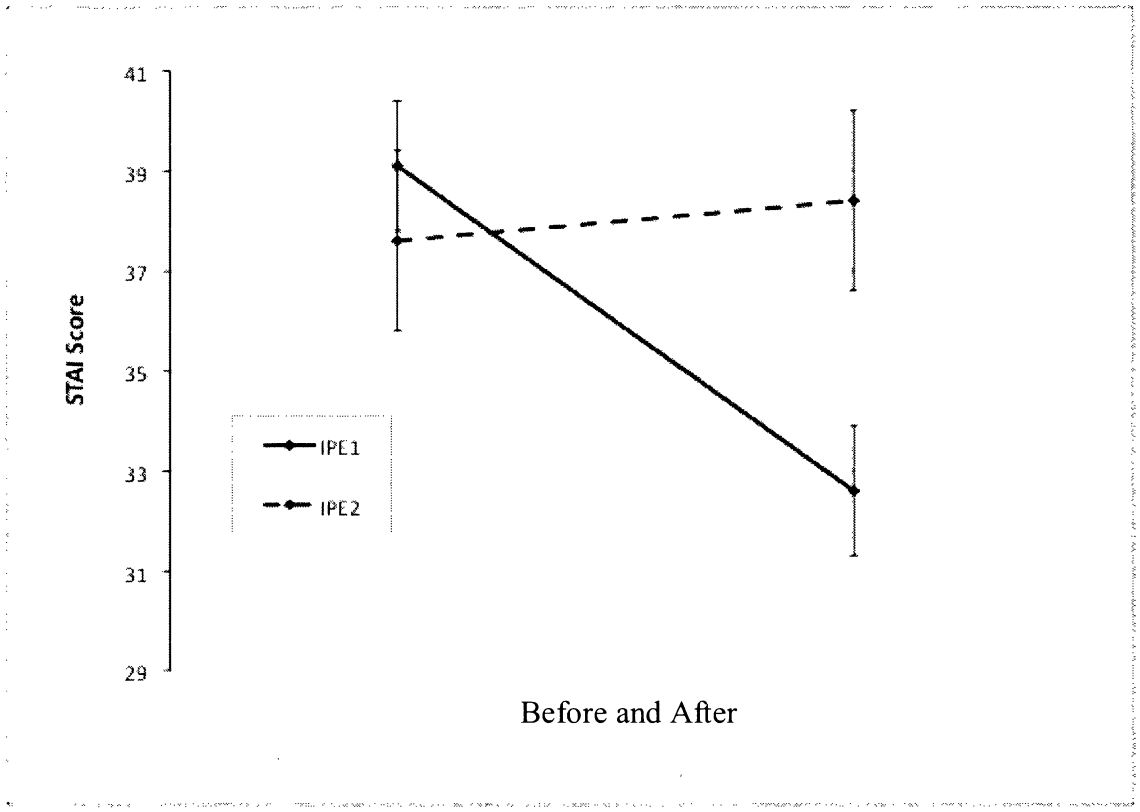

Figure 2: Average STAI score (with standard error bars) before and after education program, by IPE 1 and IPE 2

Logistic regression was not appropriate for modelling STAI scores as the outcome is continuous, not binary. Multiple linear regression was not considered as the numbers in each group were too small to obtain any meaningful results. Table 3 shows that there was no difference between the main demographic variables, which also means regression is not necessary.

4.4 Summary

This chapter has presented the results of the study and identified that students receiving IPE1, the intervention, had significantly lower anxiety levels following their clinical experience compared with students in IPE2. Overall clinical experiences were similar and similar themes were identified in the comments that students made about their experiences. These results will be discussed in the next chapter.

Chapter 5: Discussion and Conclusions

5.0 Introduction

This quasi-experimental study examined the impact of an IPE intervention on medical student anxiety during their labour ward clinical placement. Anxiety was measured using the Spielberger State-Trait Anxiety Inventory (1983) before and after students participated in their clinical placement in three settings. In one setting, a formal IPE1 intervention was provided. In the other two settings informal IPE2 was provided; this formed the control group. Anxiety was compared between students receiving the IPE1 intervention compared with those who did not.

In this chapter I discuss the findings of the study and explore the strengths and limitations of the study design. I reflect on my roles as the provider of the IPE1 intervention, as well as a clinical lecturer in the medical student education programme and as the principal researcher, in order to consider how this might have influenced the study findings. I explore my findings in relation to the extant literature to consider similarities and differences with the findings of others. I make recommendations for further research into the impact of models of interprofessional education on learner outcomes and describe how studies can be designed to include longer term follow up to explore the impact on future patient outcomes. Finally, I explore the implications of this research for midwifery education and practice.

5.1 Medical student anxiety was reduced

This study aimed to assess the effectiveness of two models of education, in the belief that IPE1, the model of interprofessional education developed at my hospital (Hospital J) for medical students undertaking their term in maternity care, would prove beneficial in reducing levels of anxiety, thus enhancing the students' learning experiences during their clinical placement in labour ward. A statistically significant reduction in medical student anxiety levels in the IPE1 group is an important finding ($p=0.0003$). Whether the reduction in anxiety enhanced the students' learning experiences remains an hypothesised relationship based on the review of the literature provided in chapter two

of the thesis. The literature supports the notion that some level of anxiety is a motivator for learning but excessive anxiety can disrupt learning. As this study was not able to include students' learning outcomes in terms of examination results, I am unable to make a direct link between the two. This is both a limitation of this study and an important item to include in future studies in this area.

5.2 Strengths and limitations of the study design

The main strengths of this study are the use of a control group; the calculation and recruitment of an appropriate sample size to ensure adequate power and the use of a validated tool for assessing the primary outcome, anxiety. At the same time these are the features that also present some limitations. It was not possible to randomly allocate students to receive the IPE intervention. It was also not possible to randomly allocate a person to deliver the IPE intervention. I delivered the IPE1 intervention and I will reflect on the impact of this later in this chapter.

In considering the potential limitations of a non-randomised study, it is clear that while there were differences in the acuity of women who birthed in the three institutions involved in this study, this did not overly affect the experiences of the students as evidenced by the similarity of experiences recorded in their Clinical Experience Logbooks.

Although fewer students completed both Before and After surveys than planned (70 recruited vs 80 planned), this study detected a statistically significant improvement in anxiety scores. Therefore the shortfall in the number of students recruited, and hence the reduction in power, did not effect the ability of this study to detect a statistically significant result.

The study used a validated measuring tool, which is recognised as a useful instrument to measure anxiety levels in college/university students. It is, however reliant upon self-report, and self-report measures are open to several forms of responder bias that may see them under-report anxiety (Shapiro, et al., 2000). Students who did respond in the comment section, if disgruntled, said so, and it has been my experience that students will speak their minds, especially 4th year students who have only a year to go before

they are qualified. By this stage in their training, medical students are usually very clear about what makes a quality clinical placement and are usually not afraid to provide feedback on the strengths and weaknesses as they see them. The finding that students reported reduced anxiety may have been due to social desirability bias, an issue that I reflect on further in this chapter. However my findings concur with those of several other researchers, (eg., Afriat, 1993) who have found that medical students are quite candid in commenting on their clinical placement in labour ward and their learning experiences with midwives as evidenced by the following quote from Afriat's study:

> "Excellent clinical rotation. The [midwives] made this clerkship a positive experience. Good teaching skills, personable and patient" (Afriat, 1993, p.351),
> and from my study,
> "Midwives were great teachers and guides. Indispensable in a good delivery suite rotation in terms of experience and learning's (sic)"(IPE1).

Compare this with the comments of one of the students in the current study from IPE1 who did not feel at all constrained to remark:

> "I found it a lot easier to observe...in delivery if I was 'shadowing' the RMO compared to being with a team of midwives" (IPE1)

Since the students self select their clinical placement location it may be that students differ on important characteristics such as those with higher anxiety may choose smaller and potentially less stressful units such as those in which IPE2 occurred. It may be that students who chose a site close to home had social supports built into their home lives and therefore experienced different levels of anxiety. It may also be that the smaller sites where IPE2 was delivered were more friendly and supportive and the levels of anxiety were different. Some of these will remain unknown in this study. Nonetheless, the baseline demographic data did not reveal anything I could measure that indicated they were different in any way, and in particular the State-Trait anxiety level of students was similar suggesting that they did not differ at the outset. Clinical experiences could also have been different at the different hospitals. Since they are Level 5 hospitals, IPE2

locations generally cater for less complex women than the tertiary Level 6 hospital[10] that was the location for IPE1. However, for what I could measure in the Clinical Experience Logbook, the experiences students were exposed to, were similar. The finding that students in IPE2 had higher anxiety than those in the more complex and therefore potentially more stressful environment in which IPE1 was delivered adds further weight to the findings.

Knowledge assessments for example, obtaining and comparing the students' OSCE[11] results, would have been a useful measure to explore whether students' clinical experiences improved their knowledge. This was, however, beyond the scope of this study and would be an important aspect of future research in this area.

A further strength of the study concerns the qualitative findings and the themes of Belonging to the 'tribe of medicine' and 'more hands on' that emerged from the comments provided in the CEL and the After survey. A study of medical student anxiety conducted in the UK by Hayes et al., (2004) has identified similar themes, thus offering support for my findings. In their study of undergraduate and graduate students of a medical curriculum that provides clinical experiences only in the third year of the program[12], Hayes and his colleagues found two key themes emerged. These were uncertainty about roles, which they termed 'fitting in' or 'belonging', and 'lack of clinical skills or experience' that I equate with the theme of 'more hands on' in my study. The students in Hayes and colleagues' study also identified the students' need to feel as if they belonged, not ignored or marginalised. Students in both my study, and in the Hayes et al., (2004) study, wanted to feel that they were valued and not 'in the way'.

5.3 Reflections on my role as the provider of the intervention IPE1

A major issue to consider in this study is the potential influence of my role as not only the person who delivered the IPE1 intervention in one location, but as the researcher in

[10] A Level 6 hospital has its role delineated as a tertiary level referral hospital with a neonatal intensive care unit whereas Level 5 hospitals have a special care baby unit without the capacity to provide ventilator support. Women with identified complex needs are transferred to Level 6 hospitals (NSW Health, 2002)

[11] OSCE is the acronym for the Objective Skills Clinical Examination

[12] Students at the University of Newcastle medical school undertake clinical placements from the very beginning of their program so that the issue of transition from the classroom setting to the clinical setting is not the same issue as it was in Hayes et al study location/population.

the study and clinical teacher in the medical undergraduate program. Since this was an unfunded study it was not possible to employ research assistants to conduct the study or provide the intervention. What must be considered carefully therefore is whether my central role in the study influenced the study findings in any way. The main area of concern is the self reported measure of anxiety. All self-report measures are open to biases of several forms. These include social desirability bias (Shapiro, et al., 2000) where students may have altered their responses in order to be seen as 'good' students - in my eyes.

This model embraced 'continuity of care' for the students, a model that is not only useful in health and maternity care but is also valuable for teachers and students. My personal involvement could have influenced the level of student anxiety, for example I may have tried harder to make the intervention work because I wanted it to work. However, the role of student mentor/facilitator in labour ward, while also carrying a caseload of labouring women is so demanding that to have maintained this additional level of focus would have been a challenge.

Whilst working in this model I knew most of the students (in all locations) by name, saw them at their student presentations, filled in when other clinicians couldn't make it to teaching/learning sessions, examined at the student OSCEs and met them all at their orientation. In short, I was motivated and enthusiastic about the work. The students were welcomed into labour ward and without exception were given a thorough orientation of the labour ward, including a 'Treasure Hunt' the first morning. This was a 'game' enabling students to have a good look and 'feel' around a labour room before going in to look after a woman, so they had a better idea of the layout, where equipment was, and the call-bell /alarm system in case of an emergency. They were reassured they would not be left alone that first day. They were encouraged to write out their rosters as three students per week needed a roster and night shift was highly recommended. This was always copied and copies given to the In-charge midwife, and placed in each staff office so midwives knew the names of the students that week. I must say for the most part, it was enjoyable; I did have some challenging moments and needed to call some students to order so I am sure that my usual management style was not altered.

I learnt more about the midwifery mentoring role from the students. I learnt to finely balance the way I presented the medical student to the woman, in order for her to appreciate her role as a key teacher of our future doctors. I am in awe of the many women whose generosity in having students along and sharing their experience of birth with us played a great part in the students' learning experience. I am aware some of the midwives on labour ward followed suit and in my absence would make sure the students were looked after. This may mean my role modelling may have further strengthened the impact of IPE 1 in the unit in which it occurred. This is not a bias of the study, but am integral component. Fraser's study looking in depth at how labour ward environments facilitate or inhibit student learning, made note that midwife mentors were the gatekeepers who determined whether or not male medical students in particular gained quality labour ward experience (Fraser, 2006). In my time as a midwife mentor there have been very few occasions when an approach to a woman for a male medical student attachment has been declined. In fact one disabled male student who was in a wheelchair, was warmly welcomed by a woman and managed to not only stand for the birth, holding onto the bed to steady himself but he also managed to have a lovely photo taken of him holding the baby. I don't know who looked more proud, the student or the mother!

5.4 Recommendations for further research, education and practice

Several recommendations for further research on IPE and medical or midwifery students can be made following the experience gained in this study. As the literature identified, studies must use a randomised controlled design if at all possible, as it is the most robust design for questions of effectiveness. Otherwise non-randomised but nevertheless controlled designs using sufficiently sized samples to ensure adequate power should be employed.

A key recommendation arising from the systematic review by Shapiro and colleagues (2000) is that self-report measures of stress such as the STAI used in this study need to be accompanied by more objective physiologic measures of stress for comparison.

5.4.1 Long-term Follow-up

A focus on learner outcomes should not be undertaken at the expense of considering the importance of future patient outcomes (D'Amour & Oandason, 2005). Therefore longitudinal follow up studies need to be undertaken to track students over time and as they enter clinical practice to determine the sustainability of any positive effects of IPE interventions on the learners as well as impacts on health outcomes for patients. These would be challenging (but not impossible) studies to design if considering undergraduate models of IPE, since students are likely to be a mobile population upon graduation and potentially difficult to track over time.

It would have been useful to follow up participants to discover whether they chose obstetrics as a career option as a result of an enjoyable clinical experience. A recent survey study by Pinki and colleagues (Pinki, Sayasneh, & Lindow, 2007) in Yorkshire, in response to dramatic falls in recruitment to obstetrics and gynaecology, identified an unfriendly environment and poor professional relationships for junior doctors can significantly affect their choice of career. Pinki and colleagues found that 22% of their survey respondents reported midwives were disrespectful and argumentative with junior doctors and 53% of the respondents felt that " ...there is a communication problem that needs to be addressed" (Pinki et al., 2007, p365). In my study 46% of students in IPE1 and 38% in IPE2 were considering a career in obstetrics prior to their clinical placement in labour ward. Many of the students commented on how positive they found their experience:

> "It was really fun! All the midwives were really friendly and helpful and I had a wonderful time in delivery suite!" (IPE2).

Whether such a positive experience influenced future career choices is unknown but could be investigated in future research.

5.4.2 Understanding Turf Wars

The analysis of the comments made by the students revealed themes of trust, respect and the realisation of a 'turf war' that exists between doctors and midwives. Hence my

first recommendation would be to have as a mantra to be repeated at each change of shift the comment one student at an IPE2 site wrote, which was

> "It would have been better if both the doctors and midwives refrain from making negative comments about each other to medical students"(IPE2).

As the opening chapter of this thesis identified (p.9), relationships between midwives and doctors are characterised by an undercurrent of tension and rivalry that has been acknowledged by many authors and researchers in Australia as elsewhere (eg., Fraser, 2006; Salvage & Smith 2000; Davies, 2000; Davies, Salvage, & Smith, 1999). It is not surprising therefore that it was also identified in my study as it was in Fraser's (2006) ethnographic study in the UK. Improving relationships among health professionals who all have the same focus of improving or maintaining the health of women and babies should be a simple undertaking but a recent publication by Rock (2008) reveals why this may not be the case.

Rock (2008) has articulated the underlying neuropsychology of '...collaborating with and influencing others' derived from new discoveries in brain research undertaken by integrative neuroscientists such as Gordon (Gordon, 2000; Gordon, Barnett, Cooper, Tran, & Williams, 2008) and Lieberman (Lieberman & Eisenberger, 2008). The SCARF model proposed by Rock tells us that much of our social behaviour is underpinned by an "...organising principle of minimizing threat and maximising reward". This principle exists as a network in the brain that is hardwired and this is the same brain network that is used for primary survival needs. SCARF consists of five domains; Status, Certainty, Autonomy, Relatedness and Fairness. Perceived threats to any of these five domains triggers an unconscious and automatic survival response in the individual of either withdrawal or defence. For example, many everyday conversations can devolve into arguments driven by a perceived status threat, that is, a desire to not be perceived as 'less than' another. It may be that the doctor perceives the midwife who asks questions about the management plan he/she has determined, as a threat to his/her status; midwives who are not listened to may also perceive their interaction as a status threat whereby they perceive the doctor regards the midwife as 'less than' him/herself. This interaction will therefore trigger the same

neuropsychological response in each person. The resultant conflict is unavoidable unless each health professional understands the underpinning neural patterns and works to function more effectively to reduce perceived threats. Rock's (2008) paper also provides insights into the impact on an individual's ability to solve complex problems, decision-making, stress management, collaboration and motivation when in a situation of perceived threat (p.45). It is apparent that understandings emerging from new brain research need to be included in the preparation and ongoing education of all health professionals if we are to increase trust, cooperation and collaboration to benefit those in our care. This can be provided in both interprofessional and uni-professional models of education. I offer this as a recommendation arising from my study.

5.4.3 Removing Hierarchies

We need to be guided and learn from "our young". As a group, midwives and doctors need strong role models and wise managers in order to feel confident to communicate regularly in ward rounds, peer review meetings and in daily friendly collegial communication. A degree of informality in the ward setting is, in my opinion, a wonderful Australian example of egalitarianism. In the IPE1 model, the Director of Clinical Services sets the tone for friendly communication by having all people refer to him by his first name. This absence of hierarchical relationships flows on through the culture of the labour ward. It sets a tone in which discussion is always conducted respectfully and thoughtfully whenever there is an issue of concern. There needs to be a set time and place for this, for example regular peer review of problematic cases could occur weekly, where students can experience midwives and doctors discussing cases where problems have occurred, and how we can improve our care of women and babies. The imperative to "...move away from traditional hierarchical forms of managing organisations towards the formation of networks and alliances of individuals who share similar goals..." (Brodie, 2003, p199) is an imperative identified by several authoritative sources in the maternity care field. Models of interprofessional education as described in this study may contribute to achieving this goal.

5.4.4 Leadership

Labour ward managers, who are effective and respected as leaders; who set the standard for a friendly welcoming environment are, as Fraser (2006) points out, influential in the clinical environment. Fraser's ethnographic study observed the culture of the labour ward to understand teaching and learning from the perspective of the teacher and the learner. One of her three key findings was the need to improve the learning culture in practice environments. Managers responded that they had become so familiar with the environment that they had "...not realised the intimidating effect that certain things could have on students..." (Fraser, 2006, p198).

Observing the interprofessional working of the leaders in maternity units, both midwifery and medical, also had a positive impact on students in Fraser's study. 'Interprofessional working' was not commented on by the students in my study, but exploring whether students observed positive or negative interprofessional interactions would be an important inclusion in any future research in this area.

In addition, some managers were observed to reduce the workload of midwife mentors who also had students with them (Fraser, 2006). This is an important contributor to the commitment of mentors. Positive ward cultures and attitudes influence the quality of care given; weak leadership in this role constrains learning. Medical students in my study, as in Fraser's (2006) study, recognised that the leader (whether midwifery or medical) was key to whether they were included as part of the team or not, as evidenced by the following:

> " If someone is to introduce the student it should be the registrar or consultant not the midwives. The doctors are the one's with the responsibility for the students, and generally frame the question in a more positive manner" (IPE2).

Although leadership was not a focus of my study, future research could explore the role of the midwifery manager in facilitating effective clinical environments that support midwives to take on roles as preceptors or educators of medical as well as midwifery students.

5.4.5 Education

Midwives are acknowledged and valued teachers of medical students in labour and delivery wards (Afriat, 1993; Cooper, 2009; de Costa, 2008; Feinland & Sankey, 2008; Loveridge & Fiander, 2007), and can potentially make or break the experience, especially for male medical students. They are often best placed to ensure that the students' experience in the clinical placement is in keeping with their learning objectives. I am not sure if midwives and doctors understand the learning objectives of any of the students who come into labour ward, and so it would be useful if these were articulated at each handover, for example the student could be asked, "What is your learning objective for this shift?" and this would be a way of introducing the student and the midwife into thinking about the structure of that shift. As one of the students in my study commented:

> "Midwives could be better informed about our objectives, learning topics, assessment requirements-this may provide some more teaching or narrative during deliveries (I did tell midwives/RMO's of our goals, but it would be better if they knew from the outset)" (IPE2)

A midwifery qualification requires that the midwife is skilled in the provision of health education as an integral part of the midwife/woman relationship. However, I have heard midwives say they don't think they have the skills to teach medical students, as their knowledge base is insufficient and they are not confident to teach. Confidence in teaching skills can be gained through pursuing additional qualifications such as those offered in short courses run by higher education institutions (eg Certificate 4 run by TAFE institutions in NSW). These courses focus on establishing psychological safety so that the learner is receptive to new information as well as instruction in effective teaching in small groups in the workplace. Increasing awareness of what the medical students are required to do in the clinical setting; a focus on the basics of normal, physiological birth, dealing with pain in labour and teamwork, would reassure midwives that their knowledge is well suited to the task.

Some of the students in my study however, expressed a preference for receiving their education from medical practitioners and not midwives. Further research needs to be undertaken to understand whether this is a widely held preference or a chance finding.

5.4.6 Implications for midwifery practice

Given that the common focus of all health professionals in maternity care is the wellbeing of women and their babies, there are important implications of this study for midwives. The first must be an appreciation that medical students are particularly anxious and disenfranchised within the maternity setting with its competing demands for attention. We need to have a recruitment strategy for well-informed and well-supported medical students who may in the future choose to work in maternity care and to train as obstetricians. It is important therefore that they also experience the power of women during labour and birth and learn how to respond appropriately. This role needs to be respected and supported as yet another strategy in our campaign to keep birth normal. As one student observed:

> "I had a great week however I must admit I'm now feeling rather anxious about having babies myself! I don't think I really saw any normal, happy births. A lot of it seemed very traumatic and destructive" (IPE1).

While this study focused on an IPE intervention to address anxiety in medical students, the model of IPE is just as applicable to and important for addressing anxiety in midwifery students. An IPE agenda needs to be incorporated into midwifery education and practice as well as the medical education curriculum so that we all have a greater opportunity to learn to trust and respect the complementary roles of each professional group.

5.4.7 Developing Trust

I was heartened to read this comment from one student regarding the issue of trust:

> "I feel that it would be better to spend the majority of the time with 1 or 2 midwives. This gives the student the opportunity to gain the midwife's trust and

> respect-ultimately leading to more practical experience. I have spent most of my time with [name deleted], (whom I can't praise highly enough) and due, in part, to my good relationship with her I have acted as accoucher at several deliveries. One guided, the remainder solo" (IPE1).

Trust and respect between professional groups is a pre-requisite for successful collaboration. The words of this student reveal a critical understanding of the importance of a reciprocal relationship where both parties have developed respect for the skills of the other. In the short term this has resulted in the student being supported by the midwife to achieve his/her experiential goals in the clinical placement. In the longer term this may generalise to a positive regard between both the midwife and the medical student for other interprofessional relationships. This perhaps provides one small example of what Brodie (2003) and others have described as a beginning of the development of 'professional capital', a construct "...that describes the potential enhanced capacity that midwives could experience if their work was understood, visible, recognised and valued in the provision of maternity services in Australia" (p. 203).

5.5 Conclusion

Medical students appear to face particular challenges in meeting their educational goals in labour ward clinical placements and managing the stress of the experience. The interprofessional educational model examined in this study significantly reduced anxiety in this situation and should therefore be implemented more widely. Students of midwifery could also benefit through the anxiety reducing effect of interprofessional models of education that would see them supported to learn from all professionals involved in maternity care. While this study focused on a learner outcome in response to an IPE intervention, it is important to remember that the ultimate goal of interprofessional education in maternity care is to maintain or improve the health of women and babies.

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Appendix 1: Ethics Approval

HUMAN RESEARCH ETHICS COMMITTEE

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

APPROVAL TO CONDUCT HUMAN RESEARCH

To Chief Investigator or Project Supervisor:	**Professor Maralyn Foureur**
Cc Co-investigators / Research Students:	**Catherine Whelan**
Re Protocol:	**What is the impact of Interprofessional Education (IPE) on medical student anxiety and learning outcomes in maternity care?**
Date:	**12-Jun-2008**
Reference No:	**H-2008-0027**

Thank you for your recent application to the University of Newcastle Human Research Ethics Committee (HREC) for approval of the protocol identified above.

A *Certificate of Approval* is enclosed.

THE *CERTIFICATE* AND THIS ADVICE ARE TO BE RETAINED
THEY ARE IMPORTANT DOCUMENTS

- Note any comments related to the approval.
- **Where the HREC is the lead or primary HREC, if the research requires the use of an Information Statement, ensure the Reference No. is inserted into the complaints paragraph in the approved document(s) prior to distribution to potential participants.**
- Where the research is the project of a higher degree candidate, it is the responsibility of the project supervisor to ensure that the candidate receives this approval advice.

Conditions of Approval

This approval has been granted subject to you complying with the requirements for *Monitoring of Progress*, *Reporting of Adverse Events*, and *Variations to the Approved Protocol* as detailed below.

PLEASE NOTE:
In the case where the HREC has "noted" the approval of an External HREC, progress reports and reports of adverse events are to be submitted to the External HREC only. In the case of Variations to the approved protocol, you will apply to the External HREC for approval in the first instance and then Register that approval with the University's HREC.

- ***Monitoring of Progress***

Other than above, the University is obliged to monitor the progress of research projects involving human participants to ensure that they are conducted according to the protocol as approved by the HREC. The *Certificate of Approval* identifies the period for which approval is granted and your progress report schedule. A progress report is required on an annual basis, you will be advised when a report is due.

- ***Reporting of Adverse Events***

1. It is the responsibility of the person **first named on the Certificate** to report adverse events.

2. Adverse events, however minor, must be recorded by the investigator as observed by the investigator or as volunteered by a participant in the research. Full details are to be documented, whether or not the investigator, or his/her deputies, consider the event to be related to the research substance or procedure.

3. Serious or unforeseen adverse events that occur during the research or within six (6) months of completion of the research, must be reported by the person first named on the Certificate to the (HREC) by way of the Adverse Event Report form within 72 hours of the occurrence of the event or the investigator receiving advice of the event.

4. Serious adverse events are defined as:
    - Causing death, life threatening or serious disability.
    - Causing or prolonging hospitalisation.
    - Overdoses, cancers, congenital abnormalities, tissue damage, whether or not they are judged to be caused by the investigational agent or procedure.
    - Causing psycho-social and/or financial harm. This covers everything from perceived invasion of privacy, breach of confidentiality, or the diminution of social reputation, to the creation of psychological fears and trauma.
    - Any other event which might affect the continued ethical acceptability of the project.

5. Reports of adverse events must include.
    - Participant's study identification number;
    - date of birth;
    - date of entry into the study;
    - treatment arm (if applicable);
    - date of event;
    - details of event;
    - the investigator's opinion as to whether the event is related to the research procedures; and
    - action taken in response to the event.

6. Adverse events which do not fall within the definition of serious, including those reported from other sites involved in the research, are to be reported in detail at the time of the annual progress report to the HREC.

- ***Variations to approved protocol***

If you wish to change, or deviate from, the approved protocol, you will need to submit an *Application for Variation to Approved Human Research*. Variations may include, but are not limited to, changes or additions to investigators, study design, study population, number of participants, methods of recruitment, or participant information/consent documentation. **Variations must be approved by the (HREC) before they are implemented** except when Registering an approval of a variation from an external HREC which has been designated the lead HREC, in which case you may proceed as soon as you receive an acknowledgement of your Registration.

Linkage of ethics approval to a new Grant

HREC approvals cannot be assigned to a new grant or award (ie those that were not identified on the application for ethics approval) without confirmation of the approval from the Human Research Ethics Officer on behalf of the HREC.

With best wishes for a successful project.

Professor Val Robertson
Chair, Human Research Ethics Committee

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THE UNIVERSITY OF NEWCASTLE AUSTRALIA

HUMAN RESEARCH ETHICS COMMITTEE
Certificate of Approval

Applicant: (first named in application)	Professor Maralyn Foureur
Co-Investigators / Research Students:	Catherine Whelan
Protocol:	What is the impact of Interprofessional Education (IPE) on medical student anxiety and learning outcomes in maternity care?

In approving this protocol, the Human Research Ethics Committee (HREC) is of the opinion that the project complies with the provisions contained in the *National Statement on Ethical Conduct in Human Research, 2007*, and the requirements within this University relating to human research.

Note: Approval is granted subject to the requirements set out in the accompanying document ***Approval to Conduct Human Research***, and any additional comments or conditions noted below.

Details of Approval

HREC Approval No: H-2008-0027	**Date of Initial Approval:** 20-May-2008

Approved to: 19-May-2011

Approval is granted to this date or until the project is completed, whichever occurs first. If the approval of an External HREC has been "noted" the approval period is as determined by that HREC.

Progress reports due: Annually.

If the approval of an External HREC has been "noted", the reporting period is as determined by that HREC.

Initial Approval

11-Jun-2008

Approved

The Committee ratified the approval granted under the provisions for L2 expedited review on 20 May 2008.

Renewal of Approval

Variations to Approved Protocol

Authorised Certificate held in Research Services

Professor Val Robertson
Chair, Human Research Ethics Committee

Appendix 2: Information Sheet and Letter of Invitation to Participate

UNIVERSITY OF TECHNOLOGY SYDNEY
Prof Maralyn Foureur
Faculty of Nursing, Midwifery and Health,
University of Technology Sydney
PO Box 123, Broadway NSW 2007
Ph: 02 9514 4847;
Fax 02 9514 4853
Maralyn.foureur@uts.edu.au

Information Statement for the Research Project:
Interprofessional Education in Maternity Care

You are invited to participate in the research project identified above which is being conducted by Maralyn Foureur, Professor of Midwifery, UTS Faculty of Nursing Midwifery and Health, University of Technology Sydney and Catherine Whelan midwife John Hunter Hospital; conjoint Associate Lecturer, Discipline of Reproductive Medicine, University of Newcastle.
The research is part of Catherine Whelan's studies-Masters(Hons)- at the University of Technology Sydney, supported by Prof Maralyn Foureur, Faculty of Nursing, Midwifery and Health.

Why is the research being done?

The purpose of the research is to determine the impact of two models of Interprofessional Education on medical student anxiety and learning outcomes in maternity care. One model of IPE provides a specific midwife mentor to facilitate the student learning goals, the other does not. The study design is a comparison study using a validated Before and After survey of student expectations and experiences of their labour ward clinical placement.
This study aims to assess the effectiveness of both models of IPE by comparing the expectations and experiences of medical students who receive formal IPE compared with those who receive informal support during their labour ward clinical experience. The effectiveness of IPE is yet to be established despite some studies having used the

most robust design of the randomised controlled trial (Jitapunkul et al 1995; Curley & McEachem 1998).

Who can participate in the research?

All 4th Year medical students studying Reproductive Medicine at the University of Newcastle.

What choice do you have?

Participation in this research is entirely your choice. Only those people who give their informed consent will be included in the project. Whether or not you decide to participate, your decision will not disadvantage you.

If you do decide to participate you may withdraw from the project at ant time without giving a reason and have the option of withdrawing any data which identifies you.

What would you be asked to do?

If you agree to participate you will be asked to:

1) Complete two questionnaires, one Before and one After your clinical placement in a delivery suite at either John Hunter, Gosford or Maitland Hospitals.
2) Complete a Clinical Experience Logbook during your clinical placement.

How much time will it take?

Each survey should take about 10 minutes to complete. The Clinical Experience Logbook will take around 10 minutes at the finish of each shift.

What are the risks and benefits of participating?

There are no risks to responding to the surveys. Completion of the Clinical Logbook may enable you to reflect upon the care given to labouring women. You may find this improves your understanding of Reproductive Medicine and the nature of teamwork.

How will your privacy be protected?

Your responses to the questionnaire and the Clinical Experience Logbook are anonymous and non-identifiable. Only aggregated (grouped) data will be reported. Data

will be retained for at least 5 years at University of Technology, Sydney. Only Prof Foureur and Catherine Whelan will have access to the data.

How will the information collected be used?

Data will be reported in aggregated form in a Masters (Hons) thesis held in the library of the University of Technology, Sydney and will be presented in papers in scientific journals and presented at professional conferences.

A written summary of the results will be posted on the University of Newcastle Reproductive Medicine "Blackboard" website in June 2010.

What do you need to do to participate?

Please read this Information Statement and be sure you understand its contents before you consent to participate. If there is anything you do not understand, or you have a question, contact the researcher.

If you would like to participate, please:

1) Complete the Before (pink) survey and put it in the attached envelope provided and mail.
2) The Clinical Experience Logbook is for completion during your clinical experience. This logbook is purely to obtain data and does NOT contribute in any way towards your assessment. Attached to it is the After (green) survey. This is for completion after the placement has ended.
3) Please place completed logbook and After survey in the addressed envelope provided and mail.

Further information

If you would like further information please contact Catherine Whelan at 49 214350 or Professor Maralyn Foureur at 95 14487

Thank you for considering this invitation.

Catherine Whelan Midwife, Conjoint Associate Lecturer, University of Newcastle.

Professor Maralyn Foureur, Professor of Midwifery, University of Technology, Sydney.

Complaints about this research

This project has been approved by the University's Human Research Ethics Committee Approval No: H-2008-027

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics officer, Research office, The Chancellery, the University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 49216333, email Human-Ethics@newcastle.edu.au.

Appendix 3: Before Survey

ID NO :

UNIVERSITY OF TECHNOLOGY SYDNEY

BEFORE SURVEY
Delivery Suite Expectations

Thank you for taking the time to complete the survey. It should take about 10 minutes. Please provide appropriate details or tick the appropriate boxes

My clinical experience in Reproductive Medicine is at:
Gosford Hospital □
John Hunter Hospital□
Maitland Hospital □
Tamworth Hospital□

1. What is your age in years? _____
2. What is your gender? F☐ M☐
3. What is your religion (if any)? _____
4. What was your place of birth _____
5. What is your ethnicity _____
6. Is English your first language? Y☐ N☐
7. Do you identify as Aboriginal or Torres Strait Islander Y☐ N☐
8. Please indicate your Family Status with a Yes or No

Single	Y☐	N☐
Married/in a relationship	Y☐	N☐
Have children of my own	Y☐	N☐
Have given birth myself	Y☐	N☐
My partner has children	Y☐	N☐
Planning to have children in the future	Y☐	N☐

9. When did you enter Medical School? Please tick the appropriate box.

☐Immediately after completing high school

☐After a "gap" year

☐After a period out of education and other activities

☐I entered medical school as a Mature Aged Student (eg. over age 25)

10. What was your profession/occupation before commencing medicine?

_____

11. Are you considering a career in Obstetrics and Gynaecology? Y☐ N☐

12. If not considering a career in O&G, can you please indicate the importance of this placement to your chosen field?

☐Very important

☐Important

☐Not very important

☐Irrelevant

13. What do you anticipate you will experience in delivery suite? (tick as many as you wish)

☐Seeing a baby being born

☐Helping a woman during labour and the birth of the baby

☐ Managing women in pain

☐Seeing women having a caesarean section

☐Observing the role of the doctor

☐Observing the role of the midwives

☐Working with midwives

☐Being part of the team

☐Recording in the case notes

☐Learning about documentation such as the partograph

☐Using equipment such as the CTG (fetal) monitor

☐Learning to interpret CTG traces

☐Undertaking vaginal examinations

☐Undertaking physical assessments of women during labour and childbirth

☐Undertaking an episiotomy

☐Undertaking perineal repair

☐Observing instrumental births

☐Observing obstetric emergencies

☐Assisting in the management of obstetric emergencies

☐Assisting women with breastfeeding their newborn baby

☐Talking with the woman's partner and family

☐Learning more about the anatomy of the pelvis and the pelvic floor

☐Learning more about the presentation and lie of the fetus

☐Mechanisms of normal labour

☐How to identify when labour is not progressing normally

☐Learning about shift work and how to be awake in the middle of the night

14. Please add any other comments you would like to make about your expectations of the clinical placement in delivery suite

Thank you for completing this part of the survey. Now please turn the page and complete the next section.

BEFORE SURVEY SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-1

DIRECTIONS

A number of statements which people have used to describe themselves are given below.
Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel right now, that is, at this moment, in relation to your **delivery suite rotation**. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I feel strained	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel upset	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel satisfied	1	2	3	4
9. I feel frightened	1	2	3	4
10. I feel comfortable	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous	1	2	3	4
13. I am jittery	1	2	3	4
14. I feel indecisive	1	2	3	4
15. I am relaxed	1	2	3	4
16. I feel content	1	2	3	4
17. I am worried	1	2	3	4
18. I feel confused	1	2	3	4
19. I feel steady	1	2	3	4
20. I feel pleasant	1	2	3	4

SELF-EVALUATION QUESTIONNAIRE
STAI Form Y-2

DIRECTIONS

A number of statements which people have used to describe themselves are given below.
Read each statement and then circle the appropriate number to the right of the statement to indicate how you generally feel.

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21. I feel pleasant	1	2	3	4
22. I feel nervous and restless	1	2	3	4
23. I feel satisfied with myself	1	2	3	4
24. I wish I could be as happy as others seem to be	1	2	3	4
25. I feel like a failure	1	2	3	4
26. I feel rested	1	2	3	4
27. I am "calm, cool, and collected"	1	2	3	4
28. I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
29. I worry too much over something that really doesn't matter	1	2	3	4
30. I am happy	1	2	3	4
31. I have disturbing thoughts	1	2	3	4
32. I lack self-confidence	1	2	3	4
33. I feel secure	1	2	3	4
34. I make decisions easily	1	2	3	4
35. I feel inadequate	1	2	3	4
36. I am content	1	2	3	4
37. Some unimportant thought runs through my mind and bothers me	1	2	3	4
38. I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
39. I am a steady person	1	2	3	4
40. I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4

Appendix 4: Clinical Experience Logbook

Obstetrics

Year 4

Med 14014

Clinical Experience Logbook

When you have completed your logbook please place in the provided addressed envelope /box provided and post to the Faculty secretary Kim Roderick

Please complete the details for each woman you attend during your delivery suite rotation. The signature column is to be signed by the clinician in attendance (midwife or doctor).

Clinical experience minimum requirement	**MRN**	**Relevant Details (in discussion with clinician)**	**Signature & Designation**
Observe a women having a normal birth			
Attend 3 normal births. Please list details of these births.		Participate in continuity of care of labouring woman including labour and birth, maternal and fetal observations, breastfeeding, skin to skin, transfer and follow up to post natal ward	
Labour & normal birth			
Labour & normal birth			
Labour & normal birth			

Should attend 3 complicated births. Please list the relevant details of each one.	**UR No.**	**Diagnosis/Relevant Details**	**Signature**
Instrumental delivery or Caesarean birth			
Instrumental delivery or Caesarean birth			
Instrumental delivery or Caesarean birth			
Students should observe and assist where possible when the woman has a perineal repair			

Appendix 5: After Survey

ID NO :

UNIVERSITY OF TECHNOLOGY SYDNEY

AFTER SURVEY: Post Delivery Suite Experience

Thank you for taking the time to complete the survey. It should take about 10 minutes.

Clinical experiences

1. Who is the most appropriate person to ask a woman whether she will accept a medical student for her labour and delivery care? (tick one option)
   - □The midwife directly responsible for her intrapartum care
   - □The midwife mentor
   - □The medical student
   - □The staff specialist co-ordinating her antenatal care
   - □The midwife manager of Delivery Suite
   - □Other (please explain) .....

2. How should a medical student be introduced to a woman? (tick one option)
   - □as a person training to be a doctor
   - □as a medical student/student doctor
   - □no fixed policy, leave it up to each individual
   - □as a junior member of the medical team
   - □other (please explain).....

3. Were you allocated one particular mentor in the delivery suite? Y□ N□

4. Were you attached to different mentors on each day? Y□ N□

5. How many mentors did you have during your delivery suite experience? ____

6. Should a woman in a teaching hospital be able to refuse to let a medical student observe her care? Y□ N□

7. Should a woman in a teaching hospital be able to refuse to let a medical student be involved in her care? Y□ N□

8. What is your overall impression of the midwives you have encountered over the past term with respect to their assisting you in your education? (tick one box)

□Very helpful
□Helpful
□Neither helpful nor unhelpful
□Unhelpful
□Very unhelpful

9. What is your overall impression of the medical staff you have encountered over the past term with respect to their assisting you in your education? (tick one box)
□Very helpful

□Helpful
□Neither helpful nor unhelpful
□Unhelpful
□Very unhelpful

10. How useful do you regard your delivery suite exposure in terms of your formal education? (tick one box)

□Very helpful
□Helpful
□Neither helpful nor unhelpful
□Unhelpful
□Very unhelpful

11. Please add any other comments you would like to make about your delivery suite rotation (eg. how might it be improved).

Thank you for completing this part of the survey. Now will you please turn the page and complete the next section.

AFTER SURVEY SELF-EVALUATION QUESTIONNAIRE
STAI Form Y-2

DIRECTIONS

A number of statements which people have used to describe themselves are given below.
Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel right now, that is, at this moment, in relation to your **delivery suite rotation**. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	1	2	3	4
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7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel satisfied	1	2	3	4
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14. I feel indecisive	1	2	3	4
15. I am relaxed	1	2	3	4
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19. I feel steady	1	2	3	4
20. I feel pleasant	1	2	3	4