

Interprofessional Collaboration and Patient Safety: An Integrative Review

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Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Rosalind Jackson

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Dedication

This work is dedicated in loving memory of my
Father
Anthony Ross Jackson
October 1933 – October 2011



Abstract

Interprofessional collaboration is a model of care that can improve patient safety. However, the evolution of knowledge about these two interrelated topics has largely occurred in isolation of each another. Consequently, it is argued that a lack of integration between interprofessional collaboration and patient safety has generated a barrier to a specific way forward to guide how collaborative practice can positively influence safe patient care. To examine this further, the research questions for this review explores the relationships between these topics and asks how interprofessional collaboration can support patient safety now and in the future.

The research design is an integrative literature review. Literature was reviewed initially using a Critical Appraisal Skills Programme evaluation tool. Parallel to this the literature was analysed thematically and several themes identified. Firstly, it is evident that the relationships between interprofessional collaboration and patient safety are broad and discussions of the topics are generalised. Secondly, current models of interprofessional collaboration do not support patient safety because patients appear to be passive within the collaborative relationship. Thirdly, if interprofessional collaboration and patient safety are to be progressed in practice, a theoretically informed model is needed to assist health professionals and organisations to develop a culture change.

Recommendations of this report have focused on how the relationships between interprofessional collaboration and patient can be progressed. This can be achieved by choosing explicit patient safety outcome measures, in an interprofessional collaborative context, that encompasses the broad spectrum of patient safety. To achieve this aim, a more flexible theoretical and methodological approach can be applied to a research question. Furthermore, to reverse the moderate quality of research articles available to date, use of an evaluation framework will support disciplined reporting of research outcomes. Finally, further development of an interprofessional collaborative and patient safety evaluation model is a recommendation for future development. This early model development integrates components of organisational preparedness and interprofessional competencies to enable organisations to assess the degree that collaborative practice exists

within them. Patient safety forms the central core of this model and is reinforced as the primary focus and central point for all health professionals.

Chapter One

This dissertation is an integrated literature review on interprofessional collaboration and patient safety. For the purpose of this research, interprofessional collaboration is defined as occurring when multiple health workers from different professional backgrounds work together with patients, families, carers and communities to deliver the highest quality of care (WHO, 2010). Patient safety is defined as freedom from accidental injury (Richardson & Storr, 2010), medical error (Currie & Watterson, 2007) or adverse event. Medical error is an unintended act or one that does not achieve its intended outcome, whilst an adverse event is any incident or accident whereby a patient is harmed as a result of their care or treatment (Currie & Watterson, 2007).

The interrelationship between interprofessional collaboration and patient safety is critical. Patient safety is of paramount importance in a healthcare organisation as it is a means for improving models of care for service delivery. Applying this to my workplace, I am a senior nurse leader responsible operationally and professionally for leading nursing within surgical services. My role requires that I work in partnership with key stakeholders that include a business and a medical leader, and that I participate in patient safety initiatives such as clinical communication, the prevention of patient falls and improve rates of surgical site infection. These projects call for stakeholders to engage and work collaboratively. However, experience indicates that some health professionals resist being involved in collaborative working relationships with colleagues from different disciplines. This is problematic as it affects patient safety. While it seems logical for professional groups to work collaboratively to advance patient care, there appear to be barriers that prevent professionals from doing so, even though patient safety may be compromised.

As a result, the beginning position in this dissertation is that there is a lack of integration in the literature between interprofessional collaboration and patient safety. Consequently, that raises a barrier to providing a specific way forward that guides how collaborative practice can positively influence safe patient care. A previous literature review (Jackson, 2011), identified specific barriers to interprofessional collaboration and patient safety. These included traditional ways of working, methodological inconsistency in research design and terminological confusion. That review generated an assumption that

interprofessional collaboration is a model of care that is responsive to an increasingly complex health care environment. For that reason, interprofessional collaboration has the potential to become a model of care that can reduce adverse events. In other words, interprofessional collaboration can promote safer care and improve patient outcomes.

Therefore, using a general, inductive approach - a thematic analysis of the interprofessional collaboration and patient safety literature, this research explores the relationships between these two complex topics. The outcome of this process will be recommendations as to how interprofessional collaborative practice and patient safety can be progressed in practice.

Background

In recent years, care delivery has changed dramatically and the emphasis on collaborative health professional practice has increased. This concept can be found much earlier within the World Health Organisation, which, in their Declaration of Alma-Ata (WHO, 1978) advocated for multi-professional health workers to work as a team to respond to the health needs of a community. This call for multi-professional health practice was emphasised again by the World Health Organisation in 1988. They specifically stated that multi-professional teamwork combined with complementary skills and knowledge would have a greater impact on health than the contribution of individual members (WHO, 1988). At the same time, changes in service delivery have influenced the evolution of clinical knowledge and evidence, which has increased the availability of medications and treatments (Millenson, 2002). Patients have higher expectations about accessing health care resources; and many expect improved quality of life and less fragmented service delivery (McGaw, 2008; Norris, Glasgow, Engelgau, O'Connor, & McCulloch, 2003). Similarly, expectations have altered attitudes to patient safety, which have changed due to the growing body of evidence that monitors our understanding and efforts to prevent adverse events (Leape & Berwick, 2005). In this context, improved collaboration is one way to reduce risk for patients (Norris et al., 2003). To this end, interprofessional collaboration is a model of health care delivery that supports safe patient care. Consequently, over the last 33 years collaborative practice and patient safety have evolved from being implied concepts into tangible strategies to improve health outcomes.

One way to show the link between collaborative practice and improved health outcomes is via the World Health Organisation model of health and education systems (see Fig 1.0). This model suggests that there is a relationship between interprofessional education and collaborative practice and that, when this works well, it supports improved health outcomes (WHO, 2010). What stands out in this model is that the way in which health care is delivered to patients can be shown to influence outcomes. This model is a useful reference point as it demonstrates the importance of health outcomes and how these are affected by health delivery systems and processes. This means that

interprofessional collaboration is a model of care delivery that, when combined with patient safety initiatives, is integral to improving health outcomes.

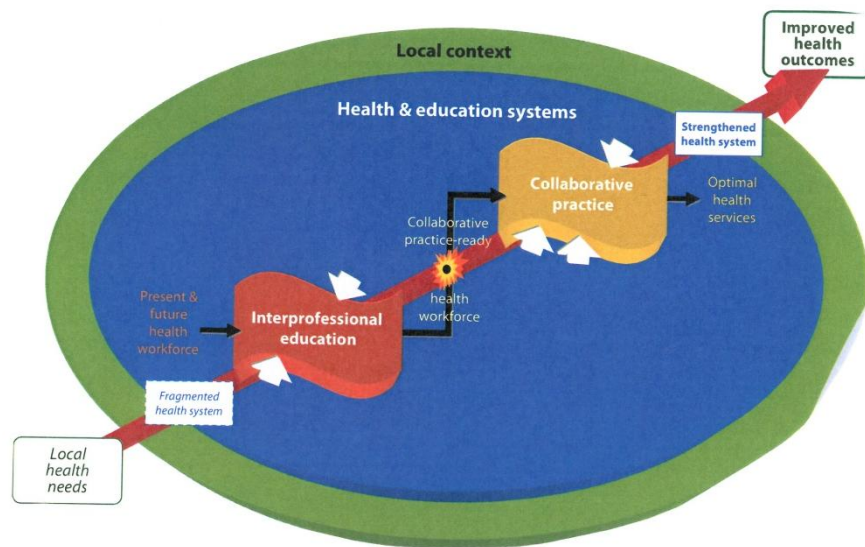


Figure 1.0. Health and information systems that contribute to collaborative ready work force and therefore improved health outcomes.

(WHO, 2010, p. 9)

The model of care delivery is imperative because health outcomes and patient safety can be compromised by unsafe medical care that has been shown to be a major cause of morbidity and mortality throughout the world (WHO, 2008). Examples of unsafe care include adverse drug reactions, health care associated infections, and an increased incidence of patient falls in hospitals. Patient safety issues are more common today because significant medical and technological advances have increased the occurrence of adverse events (Millenson, 2002). Leape (1991) has analysed the specific nature of adversity, identifying percentages of patient adverse event, categories of harm and the context where harm occurred (Leape et al., 1991). While context influences patient safety, human error affects patient safety in practice (Buerhaus, 2004; Currie & Watterson, 2007; Leape, 1994; Reason, 2000; WHO, 2008). As a result, the combination of an increased opportunity for error to occur and our greater knowledge about the nature of human error and adverse events suggests that the way health professionals work together has some

impact on patient safety. This is because, in a more complex health environment, individual health professionals practising in a traditional, 'silo' model of care (where each health professional practices separately) are less able to individually monitor the effectiveness about how planned health care is delivered (Norris et al., 2003). Consequently, without an integrated, collaborative approach there may be a higher risk of error occurring. In support of this view, the World Health Organisation (2010) argues that interprofessional collaboration can play a significant role in mitigating many of the challenges associated with patient safety. They provide examples such as improved co-ordination of care, accesses to service, reduced hospital complications and improved end of life care.

In practice though, improving patient safety is problematic, as ambiguity exists around the terminology of patient safety vs patient outcomes and what happens when collaboration is introduced into the equation. As stated, part of the problem is the tension between dominant, uni-professional models of care delivery that are centred on professional autonomy and individualism (Leape & Berwick, 2005). This model is very different to the interprofessional collaborative model, which has been shown to be more responsive to health care complexity (Norris et al., 2003; WHO, 2010). Another problem is that interprofessional collaboration and patient safety tend to be discussed in general terms without consistent definition (Kerfoot, Rapala, Ebricht, & Rogers, 2006). This suggests that the interprofessional collaboration and patient safety literature is fragmented and relationships perhaps assumed. These examples demonstrate how ambiguity about the relationship between these two concepts supports the argument of this dissertation. The lack of coherence between these two interrelated topics is a barrier to a specific way forward that guides how collaborative practice can positively influence safe patient care.

Although endorsing collaborative practice, an example of this assumption is found within the World Health Organisation's own model of health and education systems (see Figure 1.0). Whilst the model promotes how a collaborative ready workforce can improve health outcomes, it is the global health workforce shortage rather than patient safety that is the main driver towards collaborative practice (Nisbet, Lee, Kumar, Thistlethwaite, & Dunston, 2011). This suggests that the reason there is less emphasis on specific patient safety outcomes is that poor outcomes and adverse events are an inevitable consequence of workforce shortages. Given the repeated call for further research that demonstrates

linkages between interprofessional collaboration and improved patient safety outcomes the relationship between these two concepts needs to be strengthened (Bainbridge, Nasmith, Orchard, & Wood, 2010; Gillespie, Chaboyer, & Murray, 2010; Grol, Berwick, & Wensing, 2008; Hofoss & Deilkas, 2008; Kitto, 2010; Nisbet et al., 2011).

Research Significance

To recap, over time, the delivery of health care has changed and the emphasis on collaborative health professional practice has increased. This relationship between collaborative practice and improved health outcomes is evident in the World Health Organisation's model of health and education systems (Fig 1.0). From this model, it is evident that health outcomes and patient safety can be compromised by unsafe medical care that is a major cause of morbidity and mortality. Despite this, 33 years of knowledge evolution about these two major concepts has not resolved the ambiguity that surrounds how these two concepts relate to each other. This has led to barriers to achieving a coherent way forward.

With this in mind, this dissertation will analyse the relationship between interprofessional collaboration and patient safety. This research is significant because both interprofessional collaboration and patient safety are important topics to enhance understanding of suboptimal patient care and different approaches to care delivery (Grol et al., 2008).

If health professionals do not pursue how interprofessional collaboration and patient safety relate to each other, the status quo of a dominant uni-professional framework of health care delivery will prevail. This is not an option as there is compelling evidence that poor communication and ineffective teamwork results in adverse patient outcomes (Headrick & Khaleel, 2008; Wakefield, Carlisle, Hall, & Attree, 2009; Zwarenstein, Goldman, & Reeves, 2009). Furthermore, current and future workforce shortages (Duckett, 2005; Reeves, Nelson, & Zwarenstein, 2008; Samb et al., 2007), and an increasing complexity of care due to growing chronic disease burden (Sargeant, 2009) forces health professionals to explore alternative models of care.

Whilst a previous general literature review identified some of the issues, that are summarised in the next chapter, a more robust research approach to the literature provides opportunity to examine further and clarify, current levels of knowledge (Dickson, 2005).

The research is a qualitative, integrative, literature review whereby research on interprofessional collaboration and patient safety will be summarised and analysed. An integrative review is described as 'research of research' (Whitemore, 2005, p. 58). Through this process, the analysis will lead to recommendations on how interprofessional collaborative practice and patient safety can be progressed in practice (Whittemore, 2005).

In qualitative research, the researcher explores the what, how or why of a particular social phenomena (Greenhalgh & Taylor, 1997; LaPier & Scherer, 2001). Aligned with an interpretative theoretical perspective, there is an assumption that the purpose of qualitative research is to describe and understand meaningful social action that explains fluid definitions created in human interaction (Davidson & Tolich, 2003). Thus, the research question anchors the researcher to the intellectual curiosity that the researcher cares and wants to know more about, but remains flexible to unanticipated directions of the research process (Jones, 2002). With these principles in mind, the research questions for this dissertation are:

- 1) What are the relationships between interprofessional collaboration and patient safety?
- 2) How does the interprofessional collaborative model of health care delivery support patient safety?
- 3) How can interprofessional collaborative practice and patient safety be progressed in practice?

Dissertation Structure

Chapter One has set the scene about challenges surrounding the relationship between interprofessional collaboration and patient safety. The background has summarised interprofessional collaboration and patient safety knowledge and explored why the relationship between these two complex topics is important. Some barriers such

as professional tensions, topic definition and terminological inconsistencies have been briefly outlined. The research significance is stated and the research method of an integrated literature review is introduced.

Chapter Two further refines the research significance and questions by providing a more detailed account of interprofessional collaboration and patient safety literature. Subheadings include the organisational context, interprofessional collaborative competencies and models of care. The sub-headings about patient safety include professional culture, comparisons with other industries and how methodological differences have influenced research outcomes. These outcomes stem from a general literature review completed prior to this dissertation and provide the baseline of identified issues. Hence, they will be valuable to revisit and compare against those themes that emerge from this integrative data analysis process.

Chapter Three returns to this research to describe the methodological and theoretical perspective applied to this research design, that is, an integrative literature review using general inductive thematic analysis. The five stages of an integrative review are described here.

Moving onto the research method, chapter Four explicitly outlines the process of literature search that forms the data sample for this review. This includes selection criteria for the data sample and actual results of electronic data base search strategies. The final summary of those studies that met the inclusion criteria are provided in this chapter. Further evidence is provided in Appendix A that makes explicit how each article meets the inclusion criteria and where this information was found. In addition to this, evaluation of the data sample is an important stage of an integrative review. The Critical Appraisal Skills Programme tool was the evaluation tool used and this chapter describes the application process more fully. Appendix B provides the detailed evaluation outcomes for each research article.

Chapter Five presents the findings of both the data evaluation process and the inductive thematic analysis. Outcomes of the data evaluation are presented first. Following this, five key themes that have been identified from the analysis process are

presented. Direct quotes are utilised from the literature to demonstrated identified themes.

Chapter Six takes the five themes identified from the review and considers these in the context of the three research questions. It is also important to reflect on how these themes are similar to or different from the issues that have already been identified as surrounding interprofessional collaboration and patient safety. The outcome of this discussion is several recommendations that will strengthen the relationships between these topics in practice. This chapter then concludes this review with a section on research limitations and suggestions for future research.

Chapter Two

The Research Context: The Story So Far

To begin, the reader's attention focuses on a literature review of interprofessional collaboration and patient safety. This is important for two reasons. Firstly, review of literature sets the scene for this dissertation and places interprofessional collaboration and patient safety issues in context. Secondly, it is valuable to reflect on the general themes revealed thus far, so that they can be evaluated together with the outcomes of this integrative review. To achieve this aim, literature was sourced via electronic data bases searches using broad key words including interprofessional collaboration, collaborative practice and patient safety. The date range was also broad which provided the opportunity to reflect on how knowledge of the topics has evolved over time. Thus, this chapter acts as an evidence foundation that has informed the research significance and provides a baseline of identified issues to build upon. The way that this will be approached will be to review the interprofessional collaborative literature before moving to the patient safety literature. Lastly, the common elements between these two topics are summarised.

Interprofessional Collaboration – Drivers for Change

Collaborative practice occurs when multiple health workers from different professional backgrounds work together with patients, families, carers and communities to deliver the highest quality of care. It allows health workers to engage any individual whose skills can help (WHO, 2010, p. 7).

With this definition of collaborative practice in mind, the literature outlines drivers for change that impact upon the way health care is delivered to patients. Firstly, the traditional uni-professional model of care delivery is less able to respond to an increasing complexity of health care. This is because this model is characterised by a single physician led authority, which is less responsive to more complex and differentiated health need (Baldwin, 2007b). The lack of flexibility inherent in the traditional model of care underpins government, policy and professional body endorsement for change towards a more responsive, collaborative model of care (Cote, Lauzon, & Kyd-Strickland, 2008; McCallin, 2005; McGaw, 2008; Reeves et al., 2008; Rice et al., 2010; Robinson & Cottrell, 2005; Soubhi

et al., 2009). The second driver of change is that there is growing evidence that links patient outcomes with the way health professional work together. Several authors recognise that the model of care delivery has inevitable consequences for patient care (Bainbridge et al., 2010; Gillespie et al., 2010; Kitto, 2010; Smith, 2008; Wakefield et al., 2009). The third driver for change is fragmentation in the way health care is currently delivered. This has been identified as a major challenge to meet both complex health care and ensure patient safety (Kearney, 2008; McCallin, 2005; Rice et al., 2010; WHO, 2010). At the same time collaborative competencies are a strong theme throughout the literature and considered a robust (although varied) framework to facilitate collaborative working. The impact of all of this however, appears to be dependent on the organisational context in which care is delivered. These drivers suggest that the model of care influences patient safety and this is explored further.

Traditional model of care vs Interprofessional collaboration.

Traditional, uni-professional models of care have been led by personal family physicians, hospitals and clinics (McGaw, 2008). The traditional model of care is characterised by an individual focus on the presenting complaint. Care tends to be reactive and responsive to the immediate presenting issue. Care goals are often short term and led by individual health workers, who usually work independently in the practice environment (Norris et al., 2003). This type of model is particularly effective in an acute, single disease situation (Soubhi et al., 2009). However, over time, population growth, increasing clinical evidence, improved medications and advancing treatments have placed a demand on health care that traditional models of health care are less equipped to meet.

At the same time, patients have higher expectations for health service delivery and quality of life (Millenson, 2002; Norris et al., 2003). One outcome of these factors is longer life expectancy and an associated growth in chronic disease. Chronic disease management occurs best when it is co-ordinated across health providers, is focused on at risk population groups and seeks to minimise complication thus promotes quality of life and patient focused outcomes (Norris et al., 2003). Not surprisingly, traditional care is less equipped to appropriately manage chronic care conditions. These are better managed using a holistic

approach to care provided by an integrated team that have a broad view of disease and co-morbidities. This approach takes into account immediate and longer-term views of health goals and health outcomes (Norris et al., 2003).

In addition to the traditional model of care being less responsive to contemporary health demands, there is an estimated global shortage of 4.3 million health care workers (WHO, 2010). Unfortunately, this is expected to worsen in the future (Nisbet et al., 2011). For instance, those that remain within the health workforce are ageing. Put simply, in the future there may not be enough health workers to support traditional ways of working. It is clear that available health workers will need to be accessible and utilised in the most efficient way possible. For example, patients are often inaccessible in remote locations and poor access to geographically based care can lead to health inequalities (S Reeves et al., 2008). This sort of situation challenges and emphasises the need to revisit how health care is delivered to patients. This is important if we are to respond to complex practice situations and acknowledge that single professions alone cannot meet the needs and expectations of the patients (Nisbet et al., 2011).

Overall, contemporary health care is more complex due to the rise in chronic conditions, a rapidly changing health care context and workforce shortages. In order to manage this interprofessional collaboration is regarded as a more responsive and flexible model of care for service delivery (Nisbet et al., 2011; WHO, 2010). When patient safety is introduced into the equation, it is not surprising that the choice of model of care influences patient outcomes.

Linkages between patient outcomes and ways of working.

Throughout the literature interprofessional collaboration is promoted as a model of care that can improve patient outcomes, i.e. to ensure that patient care is efficient and effective as possible in a rapidly changing and complex health care delivery system (Reeves et al., 2008). There is growing evidence that patient outcomes improve when delivered by collaborative teams (Solomon, 2010). The emphasis on safe patient outcomes, free from adversity, becomes a compelling argument for health professionals to use a collaborative

model of care. For instance, within a Cochrane literature review (Zwarenstein, Goldman & Reeves, 2009), examples of enhanced outcomes for patients include patient education interventions, some evidence of improved working cultures within an emergency department and some reduction in occurrence of error (Campbell et al., 2001; Morey et al., 2002). More examples include improvement in care delivery to domestic violence victims, and knowledge sharing between professionals providing care to mental health patients (Brown, Boles, Mullooly, & Levinson, 1999; Reeves et al., 2008; Thompson et al., 2000; Young et al., 2005). Interestingly, these studies have shown that there is inconclusive evidence that interprofessional collaboration has enhanced patient outcomes. Despite this, most authors suggest that interprofessional collaboration makes a positive difference to patient outcomes. However, this is questionable, as the description of how this occurs is inconsistent and non-specific. One explanation for this limited interpretation may be the dubious quality of studies that may weaken the credibility of outcomes. This point is made within a Cochrane literature review in which Reeves et al. states that studies of poor quality cast doubt about the effect of interprofessional interventions on patient outcomes (Reeves et al., 2008). For example, Gillespie et al (2010) provide a systematic literature review that examines teamwork training plus collaborative tools such as briefings, workshops and simulations as methods to improve communication thus reducing adverse events. There are though, only tentative links made between interprofessional collaboration and patient safety that are apparently due to the use of the tools. There is an assumption that improved teamwork must make some positive difference but the evidence is not convincing. Further example of this is found within Reeves et al (2011) who conducted a scoping review of the interprofessional literature. The review included evidence of enhanced patient safety that was demonstrated by the use of a surgical safety checklist. However, it was unclear whether the checklist or collaborative communication contributed to this outcome (Haynes et al., 2009). Therefore, the link between interprofessional collaborative education interventions, tools and change in practice to benefit patient safety may be inconclusive (Cote et al., 2008; Gillespie et al., 2010; Kerfoot et al., 2006; McCallin, 2005, McCallin, 2006; Reeves et al., 2008; Rice et al., 2010). It would appear that the focus is either on patient outcomes or on team collaborative skills rather than connectivity between the two concepts.

Despite this, the World Health Organisation is more optimistic that there is indeed sufficient evidence that collaborative practice can improve access and co-ordination to health services thereby improving health outcomes. Examples include a reduction in hospital complications, decreased length of hospital stay, decreased mortality rates and increased satisfaction expressed by patients about their care (Baldwin, 2007a; D'Amour, Ferrada-Videla, San Martin Rodriguez, & Beaulieu, 2005; Hall, 2005; Lamb, Zimring, Chuzi, & Dutcher, 2010; Reeves et al., 2011; Solomon, 2010; WHO, 2010). Analysis suggests that this evidence is inconclusive due to the ambiguity about which patient outcome variable should be selected and how this is measured. This is a barrier to robust evidenced based outcomes when trying to establish evidence that demonstrates improved patient care in an interprofessionally collaborative context (Baldwin, 2007a; Reeves et al., 2011).

Evidence of fragmentation.

In reality, the extent to which safe patient care is enhanced by collaborative practice seems to be ambiguous. This ambiguity has been alluded too and may be, in part, due to inconsistent methodological approaches to study the topic. For example, much of the literature refers to anecdotal evidence about issues (Horsburgh, Merry, & Seddon, 2005; Kearney, 2008; Kitto, 2010; McCallin, 2005; McGaw, 2008; Miers & Pollard, 2009; Norris et al., 2003; Smith, 2008; Soubhi et al., 2009). Examples of literature that is methodologically explicit involves mixed method research (Robinson & Cottrell, 2005; Wakefield et al., 2009), qualitative ethnography (Rice et al., 2010), environmental scan and grounded theory research (McCallin, 2005). The quantitative contribution is even less apparent when the two systematic reviews are analysed in more detail (Gillespie et al., 2010; Reeves et al., 2008). This is perhaps unexpected, as medicine has been shaped primarily by the quantitative scientific method. This positivist theoretical perspective strives to find the truth in a research question and is an approach that has focused on identifying the most dominant and credible evidence which influences practice (Crotty, 1998; Grant & Giddings, 2001). Because the medical profession supports the evidenced based paradigm, other qualitative theoretical perspectives and methods may be considered lesser quality of evidence. Whilst there is increasing evidence that supports how qualitative and

quantitative research methodologies can contribute to a broader knowledge of the complexity inherent in health care issues – debate remains about how this should occur (Bellali, 2011). Therefore, until greater consensus is achieved outcomes of qualitative research and discussion papers remain at risk of being dismissed (Grant & Giddings, 2001).

Solomon (2010) also states that whilst higher levels of evidence linking collaborative practice with safe patient care are emerging, there is still a sufficient gap in methodologically sound evidence. This may enable clinicians to choose not to change their practice thereby remaining with the status quo. Reeves et al (2009) support this view within their systematic literature review that challenges the lack of robust research design in studies on interprofessional education practice and its impact on patient outcomes. In a very recent follow up study Reeves et al. (2011) recognise that blurred definitions of collaborative practice persist demonstrating a lack of conceptual framework that is a barrier to development of a compelling evidence base. Reeves goes on to describe a ‘terminological quagmire’ that aptly names the range of descriptors for collaborative practice. For example, statements such as practice redesign (Norris et al., 2003), productive interactions (McGaw, 2008), multidisciplinary, interdisciplinary, interprofessional (WHO, 2010), teamwork (McCallin, 2006), joined-up thinking (Robinson & Cottrell, 2005) and technical solutions to socio-cultural adaptive problems (Kitto, 2010), all describe elements of collaborative practice. Inconsistency in the language of collaborative practice means that authors and practice settings may take what they wish from collaborative practice to adapt to their own context. An example can be found in Kitto (2010) and Gillespie et al., (2010) who describe the use of tools, checklists and simulations to enhance how professionals work together. Inconsistent interprofessional terminology plus a focus on the use of tools and technical aspects of collaboration does not address the impacts of professional culture on the way people work together, or specific patient safety outcomes. Thus, within interprofessional collaboration literature, there is methodological inconsistency and terminological confusion in the way collaborative practice leads to improved health outcomes and safe patient care. This has affected the depth of credible evidence available that has influenced the extent that the drivers for change, whilst thematically compelling, produce individual motivation to change.

Competencies of interprofessional collaboration.

While terminology raises many issues, interprofessional collaboration is still seen as a new strategy for safe health care delivery in response to changing demand (WHO, 2010). Although collaborative practice apparently supports patient safety, for interprofessional collaboration to be successful, health professionals must develop competencies to make the transition from the traditional model of working towards collaborative practice. Knowledge and expression of interprofessional competencies is also seen as a way of aligning what one knows vs how one works (Soubhi et al., 2009). Required interprofessional competencies include:

- Clarification and knowledge of roles between each professional members
- Awareness and skills in working as a team
- Shared focus on the patient
- Collaborative leadership, interpersonal relationships and communication skills
- Ability to apply critical thinking and analytical skills
- Frame work for interprofessional conflict resolution.

(Bainbridge et al., 2010; Kearney, 2008; Miers & Pollard, 2009).

The development of interprofessional competencies is interesting. All health professionals have developed, over time, the skills, knowledge, attitudes and behaviours that they require to be a successful practitioner (CIHC, 2010). For the most part these attitudes and beliefs are passed on from senior to junior professionals in isolation from other groups. In other words, members of one profession pass on knowledge from one to another, but different professions do not necessarily share that knowledge so readily. Therefore, professional membership is contingent on having common experiences, language and a consistent approach to problem solving (Hall, 2005). Hall goes on to describe this process as professionalisation in silos, which can result in the formation of different professional cognitive maps. As a result, health professionals can view the same situation quite differently. Whilst professionalization has been a prevailing process for many years so

that each profession can define its identity, scope of practice and role in patient care, this creates an obvious challenge when professionals attempt to work collaboratively.

Thus, to make the transition from uni-professionalism to interprofessionalism requires an understanding of components that inform a single professional knowledge and identity that might then be shaped into new forms of knowledge, skills and attitudes (Barr, 1998). Robinson and Cottrell (2005) describe how collaborative team members are required to reorganise their specialist vs generalist knowledge and reconsider their differing contributions to patient care, depending on the context and needs of the patient. This knowledge reflection also challenges professional status traditionally associated with knowledge, e.g. the status of specialist knowledge of a medical professional vs knowledge held by psychologists, nurses and allied health members. Long held values, attitudes and behaviour must be examined with overt reflection (McCallin, 2006). For that reason, in the context of interprofessional collaboration it is not sufficient just to name the competencies that support collaborative practice. In order for professions to commit to this change one can again see how a compelling, evidence based argument that links collaborative practice to safe patient care is required.

Organisational context.

In addition to safe patient outcomes, evidence that supports a change towards collaborative practice and the context that health is delivered in must be trustworthy and be prepared to support its members to change. Historically, health professionals have worked together well on a platform of relationships that have been built on over time (McCallin, 2005). One feature of contemporary health care is that health professionals are working together in a more fleeting, part time manner with differing schedules, accountabilities and routines (McCallin, 2005; Soubhi et al., 2009). Time is an essential component of effective collaborative working as individuals learn to work collaboratively and then integrate this collective knowledge into patient care (McCallin, 2006; Rice et al., 2010). Time however, is of the essence for health care organisations that are responsible to achieve immediate performance goals. Organisations are challenged to balance change against time required to transition from a model of working that encompasses a dominant culture of professional

hierarchies, divisions and differing values to a collaborative context (Miers & Pollard, 2009). Furthermore, health systems are often in a constant state of reform which leaves health workers little time to adjust to changing organisational context let alone a different way of working (Baldwin, 2007a; M. Robinson & Cottrell, 2005). Not surprisingly, significant change toward collaborative practice is difficult if there is insufficient time allowed to change historic ways of professional communication and interaction (Rice et al., 2010). This means that an overt organisational commitment and strategies to develop interprofessional collaboration are required to change practice. This is important, as interventions that are not assertive and consequently less visible may be ineffective against an entrenched traditional model. This is similar to issues raised in the patient safety literature, where an organisation is responsible for the infrastructure, or 'blunt end,' of care with clinical staff at the point of care delivery, or the 'sharp end' (Currie & Watterson, 2007). Thus, an organisation has responsibility for how the blunt end enables collaborative practice that supports safe patient care. Indeed, several authors argue that there needs to be a clear and overt expression of the desired model of care and steps taken towards facilitating this if change is to be achieved (Kitto, 2010; Smith, 2008; Wakefield et al., 2009).

Model of interprofessional collaboration.

As stated so far, the literature reviewed describes drivers for change, interprofessional competencies, health care context and some links to patient outcomes. There is a lack of clarity however in how this all fits together and it is suggested that a model that places interprofessional collaboration into context is required. A model allows the elements of an interconnecting system to be expressed (McGaw, 2008). McGaw adds that humans exist within systems therefore health care delivery must also. Furthermore, much has been said about the fragmentation of health care and the need for interprofessional collaboration to be more explicit. A lack of coherence within the literature may reflect this fragmentation but at the same time, it provides justification for a co-ordinated way forward. This need has been expressed within the literature as a call for an explicit way forward that discourages people to disengage from the evidence (Bainbridge et al., 2010; Kitto, 2010; McCallin, 2005; McGaw, 2008; Smith, 2008; Wakefield et al., 2009). A further advantage to

a consistent way forward that is informed by a framework is the inclusion of the patient in context. It will be important to reinforce that the patient remains at the centre of all care delivered and that safety is retained as the highest priority.

In summary, this section has described how interprofessional collaboration is described in the literature as a responsive and flexible model of care in the face of an ever-changing health care context. Health demand is changing and increasingly complex however the ready adoption of interprofessional collaboration as an explicit model of care is influenced by traditional professional ways of working and the reliance that interprofessional collaboration has on health workers developing competencies to effectively work together. The literature is inconsistent in terminology that described collaborative practice. In addition, variable methodological approaches to the evidence casts doubts as to the rigour of patient safety outcomes and the extent that medical staff especially will be motivated to adopt the findings. It is suggested that adoption of a comprehensive interprofessional model that represents collaborative practice in an accurate and detailed context is one way towards a coherent way forward.

Patient Safety

Parallel to the development of knowledge about interprofessional collaboration, a similar evolution has occurred about how patient safety is understood. Patient safety is described as an evolving science (Richardson & Storr, 2010) however, health care delivery that caused patient harm can be traced back to professional roots. For example in 1855 Florence Nightingale identified that more soldiers died in hospital of preventable causes associated with the hazards of the care environment than died of their battle wounds (WHO, 2008). Additionally, nursing and the medical profession have a strong emphasis on safety and protection. The professions are guided by the familiar oath of “first do no harm” (Leape, 1994). With this in mind, this section provides the background about how the discipline of patient safety and knowledge of error have evolved. Factors that contribute to error in health are summarised as well as how healthcare is learning from the experiences of other ‘high reliability’ organisations.

Earlier literature does not refer to patient safety as such; rather the focus is on understanding medical error and adverse event (Buerhaus, 2004; Davis et al., 2002; Leape, 2000; Leape et al., 1991). The term 'patient safety' emerges in literature after 2000 and defined as freedom from accidental injury (Currie & Watterson, 2007; Richardson & Storr, 2010). Millenson (2002) suggests that post World War II, significant medical and technological advances have increased the possibility that an adverse event may occur. A corresponding increase in medico legal concern combined with evolving media interest in error and adverse patient outcomes prompted the health profession to use research methodology to investigate the nature of adverse events in more detail. Lucian Leape MD is a sentinel author of the nature of adverse events in hospitalised patients. Leape examined the specific nature of adversity via Harvard medical practice study (Leape et al., 1991) and the context of when harm occurred (Buerhaus, 2004; Leape, 1994). Leape aligned his thoughts on context and outcomes with James Reason, a psychologist and together they have made a significant contribution to the literature on human error (Buerhaus, 2004; Currie & Watterson, 2007; Reason, 2000; WHO, 2008).

In Leape's (1991) study the most common type of adverse event were complications related to drug administration followed by wound infection and technical operative complications. Since then, examples of error recorded have broadened to include wrong site surgery, maternal deaths, patient falls and removal of wrong body part (Buerhaus, 2004; Leape, 2000; Millenson, 2002). The World Health Organisation (WHO) has collated this evidence and published a summary of adverse event categories which all events now fall under and reflect patient safety concerns across both developed and transitional economies throughout the world. These categories are:

- Adverse events due to drug treatment
- Adverse events and injuries due to medical devices
- Injuries due to surgical and anaesthesia errors
- Health care-associated infections
- Unsafe injection practices

- Unsafe blood products
- Safety of pregnant women and newborns
- Injuries due to falls in hospitals
- Decubitus ulcers.

(WHO, 2008)

It is likely that adverse events are a significant cause of global patient disability and mortality (WHO, 2008). There is recognition that many of these errors are both preventable and unacceptable. Hence there has been evolving evidence into the context of how error occurs, how error is viewed by health professionals and identifying strategies to break the cycle of adverse events (Kohn, Corrigan, & Donaldson, 2000).

There are contextual variables that have influenced the incidence of adverse events in healthcare. These variables are explained further but can be summarised as professional culture, differences in how industries view error, organisational context and enhanced knowledge of how human's learn and function (Flin & Mitchell, 2009; Kohn et al., 2000; Leape, 2000; Reason, 2000; Reynard, Reynolds, & Stevenson, 2009).

Professional culture.

The professional culture of health workers has been shown to influence the incidence of error. For example, ineffective or insufficient communication among team members has been found to be a contributing factor to adverse events (Lingard, et.al., 2004). This example illustrates how common themes expressed in the literature, transcend across disciplines as they function within the same system. For example, the earlier studies focus primarily on medical staff and how their profession responds to adverse event (Leape, 1994; Leape, 2000). Later studies broaden the professional response to nursing with some reference to pharmacists and other allied professions (Currie & Watterson, 2007; Reynard et al., 2009). What is noticed here is that the literature takes a narrow view of health professionals, viewing each professional contribution to patient safety separately.

Clearly, how professionals work together affects patient safety. Part of the problem is terminology. Consistent with the view that the patient safety literature has a more narrow view of included professional groups, there is inconsistent terminology that describes how professionals work together. Multi-disciplinary, multi-professional, uni-professional, teamwork and collaboration are all words used to describe how professionals work together. Inconsistent terminology and definition impact on how professionals engage with the literature. For instance, the original Harvard study is medically focused on individualism and injury outcome (Leape et al., 1991). Linkages between error and differences in how nurses and doctors work did not emerge until 1994 (Leape, 1994). Unfortunately, a recent commentary on patient safety progress identifies workforce shortages and training as being a significant aspect that is making slow progress (Wachter, 2010). Unengaged medical staff and a fragmented nursing response are examples of this. Overall, reference to professional working lacks consistent definition that results in a persistent and narrow interpretation of professional groups and how they work together. This is at odds with the literature that emphasises the importance of ways of working and professional culture as a key part of patient safety success (Maxfield, Grenny, Lavandero, & Groah, 2011; Wachter, 2010).

The reluctance to view patient safety from an interprofessional perspective may be due to the emphasis on individuality that pervades patient safety issues. Error in health has, for many years been associated with human failing thus negligence. Negligence is a failure by an individual to meet a standard of practice reasonably expected by an equivalent practitioner in that speciality (Leape et al., 1991). On the other hand, error is an unintended act that is an inevitable consequence of being human. Error is present in, but not the same as negligence. This lack of clarity between error and negligence has led to the traditional punitive focus on the individual when error occurs. This has resulted in ingrained defensive behaviour by the individual to avoid blame, disciplinary action, litigation, retraining and shame (Reason, 2000; WHO, 2008). Not surprisingly, health professionals have learnt to fear any consequences of error. This means that the emotional impact of error can be profound and often experienced in isolation. Therefore within this punitive professional culture of blame and avoidance, any learning from error is contained within the individual with little opportunity to share learning to benefit other health professionals,

organisational systems or the patients (Leape, 1994). Furthermore, it is evident that health professionals are socialised in perfection. Perfect performance that is free from error is the desired standard. Consequently, when error occurs health professionals have been ill equipped to cope. The traditional response is organisational focus on the individual professional “responsible” for the error (Leape, 2000).

Industrial comparisons.

Patient safety authors looked to other industries to gain perspective on how adverse error in health compares to other organisations. These are industries of aviation, nuclear power, railways and nuclear aircraft carriers (Leape, 1994; Reason, 2000; Reynard et al., 2009). Common ground between these industries and health includes the degree of professional training and education required, high reliance on technology and high degree of complexity often in stressful circumstances (Leape, 1994). Reason elaborates that these industries must maintain capacity to meet high demand and that significant failures could undermine public confidence and organisational viability. These industries have been termed ‘high reliability organisations’, are internally and externally complex, intensively interactive and perform exacting activities under pressure (Reason, 2000).

A point of difference between health and these high reliability industries however is the visibility of error. A train or plane crash, nuclear power plant failure or shipping disaster is a highly visible event that will involve multiple people, agencies and causalities. Error impacts directly upon the worker (who may also be a casualty) and the organisation (Kohn et al., 2000). On the other hand, Kohn explains that error in health usually involves a third party (the patient). Unlike a plane crash, health error rarely occurs in large numbers at once and the personal safety of the health professional and organisation functioning is rarely directly impacted upon. Health has also set itself apart from industrial comparisons by taking the position that the human organism has a high degree of variability and disease states which does not lend itself to viewing error and adverse event differently (Leape, 1994). The counter argument from high reliability industries is that they too experience a high degree of variability. The difference is that they expect this and have evolved their

systems and organisation to be prepared for eventualities of human error that health has shied away from (Reason, 2000).

The effect of catastrophic breakdown of a high reliability organisation has resulted in them being highly motivated to examine the nature of error. Over the past 25 years detailed investigations into disasters that have occurred has led to an evolving body of evidence that shows that an individual often works a certain way in a certain system (WHO, 2008). Therefore, individuals that work within poorly designed systems may produce poor outcomes. This 'system' approach to error is in direct contrast to the traditional individually focused approach to error found in healthcare. The system approach concentrates on the conditions under which individuals work and aims to put barriers in place that will eliminate or at least minimise the effect of error (Reason, 2000).

Despite the experience of high reliability organisations health has continued to be reluctant to learn from their mistakes (Leape, 2000). Throughout the literature, there is encouragement that attention to a system approach rather than individual blame is fundamental to a change in professional culture that leads to safer patient care (Currie & Watterson, 2007; Leape, 1994; Reason, 2000; Wachter, 2010; WHO, 2008). However, if embracing a systems approach to error management is contingent on the extent, that dominant professional culture prevails then progress will be slower. This is reinforced by WHO (2008) and Wachter (2010) who restate that change in systems and processes are a key aspect of patient safety advancements. However, rather than being open to a change in models of health care delivery, the patient safety literature demonstrates barriers and resistance to change, at the expense of safe care. This is supported by Hall (2005) who explains that an improvement to patient care is insufficient motivation for change from traditional ways of working. Delivery of care has been traditionally organised around the need of the health professional. It is only relatively recently that there have been moves to organise care around the needs of patients and families.

Human factors.

Aligned with a system approach to error prevention, human factors engineering is an approach used to analyse the interactions between people and design issues that surround technological devices, work site architecture, procedures, protocols and work processes (WHO, 2008). It is this design of work systems, aligned with an understanding of how humans think that ensure safety checks and balances are built into the work system. This is necessary because human factors believes that error is inevitable. Therefore, engineering of system and processes minimises dependence on the individual human being to behave and act safely (Kohn et al., 2000; Leape, 1994; Leape, 2000). Examples of tools that provide safety checks and balances include standardisation of processes, protocols, checklists, proficiency examinations, communications tools, teamwork education, case review, a system of error reporting and analysis (Currie & Watterson, 2007; Kohn et al., 2000; Leape, 1994). There is evidence however, that barriers between professional groups negatively affect the success of safety tools. For example, in a recent study safety checklists and systems were ineffective when staff members felt unable to communicate issues of unsafe practices (Maxfield et al., 2011). These 'undiscussables' demonstrates that traditional professional boundaries and expectations remain dominant.

Organisational context.

With increasingly robust evidence at hand about how human beings interact with their work systems, attention inevitably fell on how organisations were structured and led in ways that enabled error to be viewed differently (Leape, 1994). It makes sense that the traditional system of error management that focused on individual blame and accountability was not only easier but absolved the organisation from responsibility (Reason, 2000). This attitude however is not sustainable and Reason's research, as cited in Currie and Watterson (2007) explored the sharp end and blunt end of health care delivery. The sharp end is the care team made up of individual members. The blunt end of care is described as institutional context, work environment and the way care is organised. It is the blunt end of care that organisational leadership is responsible.

A systems partnership between the blunt and sharp end of care is often described as promoting a safety culture (WHO, 2008), that is shared beliefs amongst individuals within an organisation to combat latent and active error. Examples of systems and processes that promote a safety culture and which organisations are responsible for include appropriate workforce resources, training and education opportunities, quality and risk/reporting systems, appropriate production pressures and absence of unreasonable stress and fatigue (WHO, 2009). For example, complexity science is one example of a systematic framework to patient safety culture that recognises the dynamic and fluid interaction between systems (Wilson, Holt, & Greenhalgh, 2001). Once again, there is contradiction between the traditional model of health care delivery and promotion of a safety culture. Traditional healthcare organisations strive to control and minimise variation through practice guidelines, pathways, strict policies and protocols (McKeon, Oswaks, & Cunningham, 2006). This approach is consistent with the scientific theoretical perspective discussed earlier. Science is a more linear, reductionist cause and effect model that seeks to define variables in a cause and effect relationship (Solomon, 2010; Wilson et al., 2001). Therefore, it would appear that the scientific perspective and traditional model of health organisation is aligned. If this is the case, one can see how this model of health organisation is a barrier to the evolution of a patient safety culture. This is because breaking a system down to view component parts in isolation will fail because neither illness or human behaviour responds in a strictly linear fashion. To summarise, in response to complexity, the parallels between complexity science and interprofessional collaboration are evident.

Methodological issues.

While there is much literature about the development of patient safety knowledge, there are problems with the generation of knowledge and methodologies used. Evidence suggests that whilst much effort has gone into improving systems around patient care and safety there is less evidence about its effects on outcomes. This lack of specific and measureable evidence contributes to the slow pace of improvement (Grol et al., 2008). This is evident as literature refers to patient outcomes in a non-specific way. One reason cited for this is that patient safety research that focuses on outcomes is difficult to approach methodologically. Grol, Berwick and Wensing state that a combination of quantitative and

qualitative methods to evaluate knowledge are required across the broad disciplines of medicine, nursing, psychology, education, management, economics, ethics and engineering. This is clearly a challenge, especially within the positivist dominant research culture of healthcare. For example, the Harvard Medical study is a sentinel research article based on retrospective review of case notes against quantitative criteria (Leape et al., 1991). On the other hand, another sentinel publication, *To Err is Human* is a report that provides direction from the previous decade of indecision, concern and inaction (Kohn et al., 2000). Because much of the literature on patient safety is presented as a commentary without clear methodology or theoretical perspective, knowledge may lack credibility with the medical profession. Commentary is useful in that it keeps patient safety narrative current however without robust and agreed evidence about the impact of a patient safety measures on outcomes and incidence of error there is a risk of subscribing to the patient safety 'movement' without clear purpose (Goodman, 2004; Pronovost & Marsteller, 2011; Richardson & Storr, 2010; Smith, 2004).

To summarise, when knowledge about interprofessional collaboration and patient safety is reviewed it is clear that there is common ground between these topics. This chapter has formed a baseline of knowledge development about interprofessional collaboration and patient safety. It is evident that there are parallels between these topics that draws attention to the relationship between patient safety and how health professionals work together. The areas of common ground include traditional uni-professional vs a more collaborative ways of working. However, methodological differences and lack of agreed conceptual framework are also examples of barriers that hinder the generation of knowledge that would progress the interrelatedness between these two complex topics.

Chapter Three

Research Design

So far, this dissertation has examined how interprofessional collaboration and patient safety are two significant and interrelated topics that influence contemporary health care delivery. This chapter now attends to the framework for research design that is used to explore the three research questions. The methodology is explained and the steps of the data analysis process are summarised.

Methodology.

As stated earlier, the methodology is an integrative review (Whittemore, 2005). Whitmore describes an integrative review as 'research of research' (p. 58). To achieve this, an integrative review considers broad theoretical evidence and/or empirical evidence. Because this is an analysis of the literature, the methodology must be broad enough to capture a suitable data sample. An integrative review is useful because it has a broad sampling frame and is able to combine data from multiple sources and different research designs. This is important to ensure that there is suitable depth and breadth of analysis that informs the conclusion.

An integrative review is more robust than a general literature review because rigorous research principles are applied to the process. Thus, whilst a literature review informs general ideas about a topic, an integrative review aims to compile research knowledge as extensively as possible (Holopainen, Hakulinen-Viitanen, & Tossavainen, 2008). This is important as reviews of research are considered a fundamental activity of behavioural sciences (Jackson, 1980). Jackson goes on to explain that the purpose of integrative reviews range from evaluating methodological developments in a particular field, to exploring substantive issues that emerge from selected studies on a topic. With this in mind, in order to reflect robust research, it is essential that the methodology of an integrative review and methods of analysis consistently align with an appropriate theoretical perspective and epistemology (Braun & Clarke, 2006).

A theoretical perspective is the philosophy that lies behind a methodology. It provides context and basis for research steps and criteria (Crotty, 1998). Interpretivism is the theoretical perspective that underpins this dissertation. This is appropriate because an integrative review of interprofessional collaboration and patient safety aims to analyse these concepts and to form conclusions derived directly from the data. Crotty adds that the interpretivist philosophy would say that the researcher is looking for culturally derived and historically situated meanings. This makes sense as knowledge about interprofessional collaboration and patient safety are culturally and historically situated and the topic has socially constructed meanings. Interpretivism focuses on human beings and their way of interpreting and making sense of their reality (Holloway, 1997). Thus, interpretivism looks at relationships, interactions and communications that affect people and or situations.

Further evidence that an integrative review links with interpretivism is reflected in the method of data analysis. In this instance data is analysed thematically using a general inductive approach. This method identifies, analyses and reports themes within the data (Braun & Clarke, 2006). The general inductive analysis (Thomas, 2006) ensures that concepts, themes or models are identified directly from the raw data, in this case the research literature.

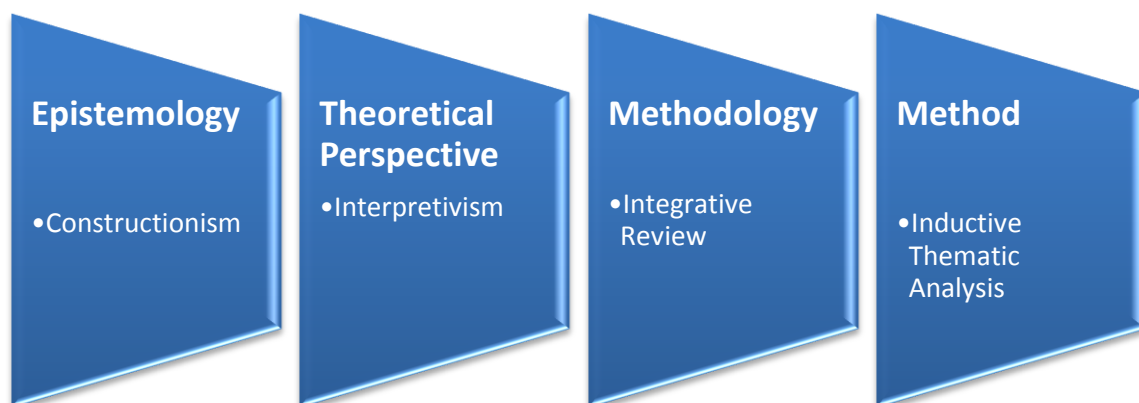
Whilst the scope of a 60-point dissertation limits theory development, semantic themes and concepts will be identified. Braun and Clarke (2006) explain that semantic, or explicit themes, are ones that can be identified from the surface meanings of the data. Interpretations of these themes move beyond description to explore thematic patterns and their broader meanings and implications. This is necessary in order to respond to the research questions.

Interpretivism, as the theoretical perspective that underpins an integrative review should be traced back to its epistemology, that is, the theory of knowledge and a way of understanding and explaining how we know what we know (Crotty, 1998; Holloway, 1997). Epistemology forms one's belief about the nature of knowledge. The epistemology that is consistent with interpretivism is constructionism, sometimes referred to as social constructionism. Holloway (1997) describes constructionism as a belief that people construct their own social world in communication with each other. Social constructionists

do not believe in objective knowledge that is independent or separate of the social world. Crotty (1998) elaborates on this view of constructionism by stating that all meaningful reality is contingent upon human practices and interactions between human beings and their world. This construction of meaning is developed and communicated within a social context.

Therefore, a qualitative methodology that draws from a constructionist epistemology and interpretivist theoretical perspective is appropriate for this research process. This is because interprofessional collaboration and patient safety concepts are meanings attributed by social interaction and constructed in the world of individuals within health care. A further example of social construction is found within interprofessional collaboration as a model of care. This occurs, as 'models of care', is a term used to describe coordination of (health) services for individuals and populations (Roberts, 2010). Thus, it is a term that has evolved because of social interaction and communication frameworks that surrounds it.

In summary:



Adapted from Crotty (1998)

Stages of an integrative review.

As stated, an integrative review is a specific method that summarises past literature to provide a comprehensive understanding of a health care problem (Whittemore & Knafl, 2005). Within this, a general inductive approach using thematic analysis is the method of

analysis used which enables identification and analysis of themes within the data. A theme captures something important about the data in relation to the research question (Braun & Clarke, 2006). The inductive approach allows research findings to emerge directly from the raw data. These findings are typically frequent, dominant or significant themes (Thomas, 2006). Braun and Clarke (2006), Thomas (2006), Whitemore (2005), Whitemore and Knafl (2005) and Jackson (1980) inform the stages of the integrative review. These steps are summarised as:

- Identification of the Research Question and Review Purpose

The first stage of an integrative review is to identify the research question and review purpose. This is important to give direction to the research and ensure the research questions are explored using an appropriate and consistent method, methodology and theoretical perspective. Within this theoretical framework, identification of a clear research problem and purpose provides focus and boundaries for the integrative review process (Whitemore & Knafl, 2005). This stage aligns with Chapters One and Two.

- Familiarise with the data

The second stage of the inductive review uses research as the raw data. At this stage the quality of the literature search is of vital importance, because inadequate or poor quality studies will affect data evaluation and analysis. Therefore, it is important to utilise explicit and appropriate search strategies to obtain the maximum number of eligible studies (Whitemore & Knafl, 2005). Chapter Four outlines the literature search process. This includes data inclusion and exclusion criteria and the strategies used to search for the data. Results of the literature search are summarised (Table 1.0). In order to make explicit how literature was selected as the data sample for this review, Appendix A is provided. Appendix A lists how articles meet the inclusion criteria and where this information was found. Initial familiarisation of the data occurs through multiple readings of the raw data as the researcher actively looks for meanings and patterns.

- Data Evaluation Stage

Within the third stage, empirical primary studies are identified so that further evaluation of rigour can occur. This is important, as the extent of methodological trustworthiness is a

critical part of the overall quality of the data (Whittemore, 2005; Whittemore & Knafl, 2005). Furthermore, the quality of the research data inevitably contributes to the data analysis stage. Interestingly though, the relationship between research quality and quality of outcomes has been reported to be controversial (Whittemore, 2005), yet remains a recommended step. One explanation for this is that despite the controversy, data evaluation is a good way to actively engage with the data (Braun & Clarke, 2006) and establish trustworthiness (Thomas, 2006). Appendix A has identified those research articles that will have the data evaluation process applied. The process of data evaluation is aligned with Chapters Four with presentation of the outcomes in Chapter Five.

- Data Analysis Stage

Data analysis organises the data into meaningful groups, which occurs through progressive labelling of themes and processes into categories. The aim of this stage is to order, categorise and summarise the data into unified conclusions (Whittemore, 2005). Specifically, this detailed process utilises category labels and category descriptions to identify examples of text that represent meanings, associations and perspectives. These then capture what the researcher considers the most important themes aligned with the research questions and how identified themes may be linked or may stand-alone. Therefore, analysis of the data considers the relationship between codes, themes and levels of themes. Throughout the analytical process, categories are continually revised and refined from perhaps multiple categories down to a small number. An important part of data analysis is stakeholder or member checks (Thomas, 2006). This exposes the thematic analysis to wider scrutiny and adds credibility to the process and research findings. For this integrative review, as there is only one author/researcher, the stakeholder check is via the process of dissertation supervision and from the examiners. The final diagram of themes identified in the data analysis stage for this integrative review is represented in Chapter five (Fig 2.0).

- Presentation of results stage

This stage tells the story of the research process and outcomes in a way that convinces the reader of the merit and validity of the analysis (Braun & Clarke, 2006). Analysis of the results provides summary, descriptive information however also critiques the outcomes

against research questions and applicability to practice (Whittemore, 2005). Commencing from Chapter Five, using broad themes as headings and using detailed description from the data, findings are written so the reader can logically follow how the raw data was obtained and analysed (Thomas, 2006).

To summarise, this chapter has outlined how an integrative review, using a thematic inductive analysis, is a qualitative research methodology that aligns with an interpretivist theoretical perspective. The five stages of the research process were described and application to this integrative review demonstrated.

Chapter Four

Literature (Data) Search

This chapter focuses on the integrative research process that will examine the relationships and themes between the interprofessional collaboration and patient safety literature. Later on, the issues that stand out in the commentary are identified. This process supports reflection about the extent that the inductive thematic analysis reveals new or consistent themes. Therefore, the following section provides detail on the actual literature search and data evaluation process. Being explicit about the process is important so that the search strategy, results and management of the data is transparent to the reader. It is important that the reader is able to judge the adequacy of the data sample. Furthermore, any subsequent reviews that wish to expand on the process can follow this research process thus avoiding duplication (G. B. Jackson, 1980).

Literature was identified using electronic databases searches that included OVID, MEDLINE, CINALH and EBSCO health database. Keywords used for searches were interprofessional collaboration, collaborative practice and patient safety. Inclusion and exclusion criteria were as follows:

Table 1.0 Raw Data Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Studies and theoretical literature focused on interprofessional collaboration <u>and</u> patient safety.	Studies focused on <u>either</u> patient safety or interprofessional collaboration.
Research written in English.	Research not written in English.
Studies published after 1990.	Studies published before 1990.
Studies focused on interprofessional collaboration and patient safety in developed countries.	Studies focused on interprofessional collaboration and patient safety in developing or transitional economies.
Published studies via electronic database.	Unpublished studies.

Studies published before 1990 were excluded to manage the potential volume of literature for a single researcher and the size of the research project. Additionally, studies published after 1990 still represent 11 years of interprofessional collaboration and patient safety knowledge development.

Firstly, reference lists and literature from the previous general literature review were evaluated against the inclusion criteria. This was to assess those articles that could be carried over to this research process. Secondly, the electronic databases were searched via AUT library access using narrow search criteria of interprofessional, collaborative and patient safety keywords. Databases were cross-referenced against each other using the same keywords. This enabled duplicate articles to be removed and new contributions identified. Table 1 outlines search results:

Table 2.0 Database search results

Search Query	Run Via	Results
Patient*safety and interprofessional and (collaboration or practice	Interface – EBSCOhost – advanced search. Database – CINAHL Plus with Full Text	146
Patient* safety and ((interprofessional N5 collaboration*)R (interprofessional N5 practice))	Interface – EBSCOhost – advanced search. Database – CINAHL Plus with Full Text	14
Patient safety and interprofessional collaboration OR patient safety and collaborative practice	Searched within Journal of Interprofessional Care and The Journal of Patient Safety	14
(interprofessional collaboration and patient safety).mp. [mp=tx, bt, ti, ab,	Remove duplicates – OVID databases. Resources “all”	74

Search Query	Run Via	Results
ct]		
Patient safety and interprofessional and collaboration	EBSCO health databases. Removed duplicates	6
Patient safety and interprofessional and collaboration	Cross referenced with literature utilised in previous general literature review.	13

The article titles were evaluated against the inclusion and exclusion criteria, then the abstract and key words were read and evaluated. Out of 267 articles, 28 specifically had interprofessional collaboration/collaborative practice together with explicit reference to patient safety in the title, keyword lists, abstract or introduction. Of these, 12 were qualitative or mixed method research articles. Only one article was a quantitative Cochrane Data base Systematic review. The remaining 15 articles were descriptive overviews of the topic. Appendix A is provided to list the characteristics of the articles that are included in the data sample and where the inclusion information was found.

There are numerous research and general descriptive articles within the databases linked to keyword combinations of interprofessional, collaboration and patient safety. In order to ensure that there was adequate sample size for a robust research process, the principle of data saturation was adopted (Holloway, 1997). Data saturation is a term associated with grounded theory research and occurs when further data sampling fails to uncover any new ideas. Whilst all articles included were analysed, data saturation was a useful quality check to assess whether it was necessary to extend the literature search parameters. In this research, data saturation occurred within the evaluation and thematic analysis of the 13 research and 15 descriptive articles.

As described in stage two of the integrative review process evaluation of the data is important to establish trustworthiness. Trustworthiness of the research process is twofold. Firstly, the rigour of the raw data for this review will be assessed by using a Critical Appraisal

Skills Programme (CASP) tool provided by the Public Health Resource Unit (P.H.R.U., 2006). This tool has been selected because it can assess both quantitative and qualitative research for validity, to examine results, and consider how these have influenced practice. Whilst no gold standard method of data evaluation exists (Whittemore, 2005) it is important that a consistent process is applied. Aligned with this view, the CASP tool does not promote itself as an exhaustive or definitive guide to evaluation of research. Rather, this tool is one option that enables the reader to systematically apply 10 questions to each research article in order to broadly consider principles that characterise research. These principles are:

- Rigour – has a thorough and appropriate approach been applied to key research methods in the study?
- Credibility – are the findings well presented and meaningful?
- Relevance – how useful are the findings to you and your context?

These principles establish the extent of study trustworthiness. This is an important principle to ascertain to what extent the reader may consider the findings valid or close to the truth (Greenhalgh & Taylor, 1997). Without validity and trustworthiness, health professionals will be reluctant to consider the applicability of research findings to their own practice context.

The screening questions and appraisal of each individual research article within the data set can be found in Appendix B. This information has been provided to support transparency of this review process. Secondly, as per Whittemore's framework (2005), the appraisal outcomes will be integrated methodologically, theoretically and empirically into the findings found in chapter five.

In summary, this chapter has made clear the steps taken to select the data sample used for the next steps in the research process. The process of data evaluation is described. In the following chapter, the findings of the data evaluation and data analysis are presented.

Chapter Five

This chapter presents findings from the data evaluation and analysis process. Outcomes of data evaluation of the 13 research articles are summarised and presented first. Following this section, research findings are described. Critical analysis of the findings are incorporated into the final chapter.

Findings of Data Evaluation Process

This section summarises the results of the Critical Appraisal Tool (CASP) (P.H.R.U., 2006) application that was used to evaluate the quality of each research article. To recap, trustworthiness is assessed by the rigor of the research process application. In turn, trustworthy study outcomes may be considered more credible and therefore potentially relevant to the reader's practice setting. Thus, the data evaluation stage focuses on the process of research (Henderson & Rheault, 2004; Holopainen et al., 2008; Whitemore & Knafl, 2005).

The following presentation of the data evaluation results is a collective summary of the outcomes according to each CASP question (bolded). For added depth, a simple, subjective quality score has been applied to each research article (Whitemore, 2005). Out of a possible score of nine each article can earn a point, half point, or no point per question. For each research article, individual evaluation assessment and scoring outcomes are provided in Appendix B.

Each article included a **statement of the aim** of the study however, the clarity, placement and breadth of research aims was inconsistent. This results in the reader having to search for detail about the study that should be explicit. The breadth of the study aims sometimes went beyond the extent of reporting (Miers & Pollard, 2009). Therefore, there was a sense that some study outcomes did not always return to the research questions/aim (Jones & Jones, 2011; Wakefield et al., 2009). When this occurs, the reader is left with a sense of ambiguity about what the study may have achieved.

The second question asks whether a **qualitative methodology** was appropriate for each study. To respond to this question, the researcher reflected on the internal

consistency between the study aim, the methodology, and the research question (Grant & Giddings, 2001). With this in mind, qualitative methodologies are anchored in developing our understanding about a particular phenomenon and construction of meaning (Jones, 2002). The research article aims were consistent in their desire to, for example, understand the nature of social interaction in relation to teamwork, or collaboration, or patient safety. Adverbs used within study aims included exploring feelings, opinions, experiences and essences of an issue. Using these words was a strong indicator that qualitative methodology was appropriate.

An interesting variation to this was found in the Cochrane review (Zwarenstein et al., 2009). The purpose of this systematic review was to synthesise randomised control trial evidence of interprofessional collaborative interventions and the relationship to patient outcomes. To evaluate the study a quantitative CASP tool was selected (Appendix B). Out of 1128 abstracts, only five studies met the inclusion criteria. One of the reasons for this was because studies using qualitative methodology were excluded. As a result, the small number of studies included in the review inevitably affected the trustworthiness of outcomes. Hence, one recommendation of the review was that both quantitative and qualitative research methods should be utilised in studies. With this in mind, whilst Cochrane Collaboration reviews are considered grade one (gold standard) evidence (Grant & Giddings, 2001), it is argued that the Cochrane Collaboration's bias towards randomised control trial evidence means that this will never be the most appropriate evaluation method in studies where qualitative methodology is used. Therefore subsequent Cochrane reviews on interprofessional collaboration and patient are likely to be found wanting.

Whilst qualitative methodology has been shown to be appropriate, most studies did not adequately explain their **rationale behind their research design**. The majority of research methods used within the studies seemed appropriate and included participant observation, narrative analysis, interviews or focus groups. Two of the studies stated they were mixed-method studies, i.e. using elements of both qualitative and quantitative methods (Anderson, Thorpe, Heney, & Petersen, 2009; Wakefield et al., 2009). Anderson et al. did not provide rationale as to why they had chosen this combined approach. On evaluation, the questionnaire data adds little value compared to data outcomes obtained from focus groups that were also held. Wakefield et al. (2009) however, provides more

justification for their mixed-method research design however limit the reader's ability to evaluate the impact of this by dividing the results across two separate publications. In summary, whilst, selected research methods are appropriate for qualitative methodology (LaPier & Scherer, 2001), the reader must have their own prior knowledge of this to be equipped to evaluate the research design. Therefore, a lack of explicit explanation about the research design is a weakness for most studies.

The explanation of **participant recruitment** was variable. Better descriptions included why the participants were appropriate to the study, how they were recruited and the informed consent process (Robinson, Gorman, Slimmer, & Yudkowsky, 2010; Weller, Barrow, & Gasquoine, 2011). Poor explanations provided some details about how participants were appropriate to the study however; there is little description about their recruitment process, selection methods or variation in participant involvement (Gum, Greenhill, & Dix, 2010; Miers & Pollard, 2009). In the main, this question of the evaluation was poorly executed.

The method of **data collection that meets the research issue** is one question that flows out of the research design. As a result, the evaluation outcomes are consistent in that the extent of description varied from little or no detail (Suter et al., 2009) to the interview guide being presented in the article (Kyrkjebo, Brattenbo, & Smith-Strom, 2006). This part of the data evaluation also looks to when data collection stops. One article (Jones & Jones, 2011) was explicit in stating that data collection was limited by time and funding however did not explore any impact this may have on the rigour of the study. The remaining authors did not attend to this aspect well ranging from no mention at all to description of data saturation being reached.

The **relationship between the researcher and participants** was a further aspect that was poorly considered across most studies. This is important so that the reader can evaluate how the researcher has critically examined their own role, bias or influence on the study process and outcomes. Excluding the systematic review, out of the remaining 12 studies only one study (Jones & Jones, 2011) went into some detail about the researcher bias and described strategies to minimise the impact on the data analysis. In the remaining articles, an opportunity for bias to occur was clear to the reader however, ad hoc attention

was given to this. For example, one study produced a potential gender bias resulting from all female researchers on a study into nurse-physician relationships (McGrail, Morse, Glessner, & Gardner, 2009). Other situations occurred where the researchers were also interviewers and known to the participants (Gum et al., 2010).

Most of the studies paid insufficient attention to **ethical considerations**. These considerations include how the study attended to the standards of ethics applied to the study. Most studies stated that ethical approval had been obtained however the reader was left to assume what this meant. Whilst specific attention to a participant withdrawal process, patient safety reporting (Wakefield et al., 2009) and data anonymity (Jones & Jones, 2011) was present in these two articles, no one article completed the ethical aspect well. This would be easily resolved if the researchers explained what ethical standards were included in the ethics approval process. Interestingly one study obtained ethical approval from three ethics committees (Miers & Pollard, 2009) but the reader is still left to ponder the significance of this.

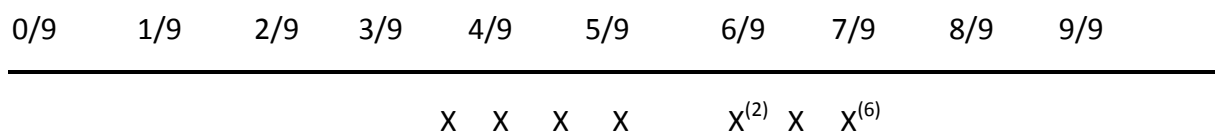
In the main, the **process of data analysis in the studies is described** in some detail. The depth of analysis about the process was limited though. For example, thematic analysis was the most common method of data analysis and whilst the researchers stated that analysis occurred, there was often little explanation about how the themes were derived from the data (Anderson et al., 2009; Suter et al., 2009). Some effort was evident to demonstrate rigour in thematic analysis by describing researcher cross-checking, data saturation and returning transcripts to the participants (Jones & Jones, 2011; Weller et al., 2011). Where software analysis tools were used this was stated although assumptions were made that the mere mention of this would be sufficient explanation about the process of data analysis. In most cases, this section appeared rushed in favour of the author's moving to presentation of the findings.

Consistent with the variable response to CASP questions, there was inconsistent attention given to **presentation of a clear statement of findings**. All studies presented data analysis findings that ranged from the purely descriptive (Jones & Jones, 2011; Miers & Pollard, 2009) to a more comprehensive discussion of outcomes (McGrail et al., 2009). Some findings (Suter et al., 2009) were returned to published literature for an additional

check. There is inherent risk here as the researcher may succumb to publication bias (Whittemore, 2005), that is, to align study findings with outcomes already known and not make any new contribution to the topic.

The final question in the evaluation tool is to assess the **value of the research**. A simple representation of the subjective quality scores is placed on a continuum (see Fig 2.0). This demonstrates a range of scores from 3.5 to 7 out of possible 9. One can see the clusters of results however, at an overall average of six, the quality of the data evaluation is assessed by this author as being of only moderate quality.

Figure 2.0. Continuum of Data Evaluation Quality Scores



Given this assessment, the evaluation of rigorous and trustworthy research can only be considered to be moderate. This is consistent with views expressed that limitations to methodological quality become a barrier to research article outcomes being relevant to other practice settings (Angeline, 2011; Infante, 2006; Reeves et al., 2008). The CASP evaluation revealed that different elements of assessment were present to various levels in each study. This was frustrating as there was a sense that by not being more careful in how the research process is reported, the researchers did a disservice to their work. Whilst journal word limits may influence the author's choice of which aspects of the research to publish, it is important to ensure that detail that represents rigour and trustworthiness is included. For example, in the lowest scoring study there was consistent and insufficient attention given to the research process (Wagner, Liston, & Miller, 2011) ending in generalised conclusions that the intervention under study was a success. Recommendations were that more experiences of this type were required to benefit the patient and health care system!

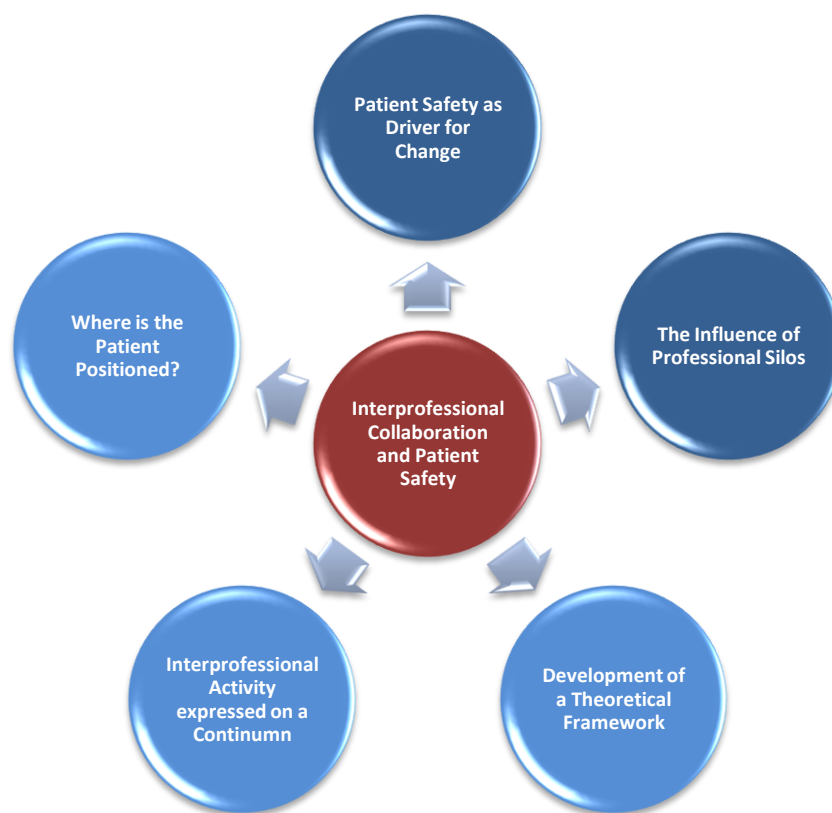
Studies that were of better quality, still demonstrated inconsistent coverage of the elements of rigour and credibility. The difference however, was that whilst the outcomes from each study could be considered limited in isolation, for those studies clustered together, there may be more value in considering their collective results. For example, Jones and Jones (2011) wished to compare common ground found in background literature with their study results. They achieved this but appeared to lack the confidence to develop recommendations. Nevertheless, study outcomes often had much in common across articles however, individual authors, due to their own study limitation, e.g. small sample size, questioned the relevance to other practice settings (McGrail et al., 2009; Rice et al., 2010; Robinson et al., 2010). Therefore, the value of this data evaluation process is that there is inevitable methodological variation in research studies on interprofessional collaboration and patient safety. This variation can be overcome with more attention given to how the process of research is conducted. Secondly, one should step back from individual articles and consider the collective message. There may be more trustworthiness in that.

Findings of Thematic Inductive Data Analysis Process

This section departs from the CASP evaluation of the research process and trustworthiness to explore the themes found within the article content. Consistent with the thematic analysis process described in Chapter Two, each article included in the data sample was read repeatedly and the themes, sub themes and messages within each individual article were noted on the articles using coloured notepaper. No attempt was made to collate the threads of information until all articles were read. This was done so that, as much as possible, the information contained within each article could be reflected upon individually. This is important in order to minimise the bias of information being transferred from one article to the next. It is acknowledged however, that as the process of analysis was completed by a single researcher, it was challenging to minimise bias of information transfer from occurring. Moderation of these themes and their content was via dissertation supervision inputs.

The next step was to consider the information across articles and identify common themes and relationships that existed between them. Using a visual aid of a thematic map (Braun & Clarke, 2006), the multiple threads of information were more easily able to be grouped and regrouped in order to identify and synthesise data into key themes. Whilst the handling of the data was a manual process, this was a readily accessible and dynamic technique. Figure 3.0 represents the final themes that emerged from the data analysis process. The sections that follow describe these findings in more depth.

Figure 3.0. Diagram of main themes from literature analysis



Reflecting on this diagram, these themes can be further grouped into two broad headings:

Themes that are more commonly written about:

- Patient safety as a significant driver for change
- The influence of professional silos on interprofessional practice and patient safety

Themes that are less commonly written about:

- Development of a theoretical framework that will support the progression of interprofessional collaboration
- Interprofessional activity expressed as part of a continuum
- Where is the patient/family positioned?

The way these themes are presented is using direct quotes from the literature to illustrate the meanings of the themes identified (Thomas, 2006). Patient focused themes are presented first, followed by the influence of professional silos. Interprofessional activity and a theoretical framework represent those themes that most likely signal the future direction of interprofessional collaboration and patient safety research.

Patient safety as a driver for change.

Within the literature reviewed, patient safety is the main driver for change towards an interprofessionally collaborative model of care. This occurs as patients are always the recipients of care delivery. As patient safety was part of the data set inclusion criteria this would appear self-evident. However, whilst safer care for patients was a key driver, the way that patient safety is described varied considerably. Descriptions of the patient's position within patient safety ranged from generic statements:

Patient safety experts also advocate optimising the function of the nurse-physician unit to reduce error and harm (McGrail et al., 2009, p. 198)

and

....collective responsibility for ensuring patient safety (Weller et al., 2011, p. 479)

to more assertive and specific expressions of patient safety:

.....(getting) the right services to the right patient at the right time (Headrick & Khaleel, 2008, p. 365).

What was noticeable was that authors had reflected on the extensive patient safety literature. This enabled them to make shorter, but heavily referenced statements such as:

Patient safety literature reports that most medical errors are avoidable and many can be prevented by enhancing communication and collaboration amongst health professionals (Sargeant, 2009, p. 178)

and

There is little doubt that promoting interprofessional communication and collaboration... is a positive strategy that will result in improved quality of care, patient safety and outcomes (Rose, 2011, p. 8).

Therefore, this enabled most authors to make brief reference to patient safety as the driver for change without providing substantial further evidence. Thus, whilst patient safety was the core incentive towards a more collaborative model of care, the range of explanation was often disappointing giving the impression of assumption and a glossing over of such a core driver.

There was more strength in the literature that acknowledged patient safety as an issue within the context of interprofessional collaboration compared to the current single professional model of care:

Consequently, recent patient safety literature has emphasised the importance of interprofessional collaborative or team approaches to learning and the delivery of patient safety education (Wakefield et al., 2009 p. 23).

Also from Wakefield:

Changes can only be achieved if all healthcare professionals work together as part of a cohesive team. It is only by working together that practitioners are able to develop the necessary knowledge and skills to manage adverse events (p. 23).

What appears to be happening is that the significance of patient safety is assumed to be known to such an extent that less emphasis is placed on explaining this important concept. Consequently, one can see that despite patient safety being such a pivotal motivator for change, it has received less direct attention within the literature reviewed on interprofessional collaboration and patient safety. The impact of this on the progress of interprofessional collaboration partnered with patient safety is explored further in the discussion chapter. However, this does lead into the next theme, that of the patient's position and role within their own care.

Where is the patient positioned in their care?

The theme of patient's placement in their care fits here because it aligns with the earlier impression that the patient's role is assumed or takes on a lesser component of the article's purpose. Therefore, the role of the patient was an underlying theme revealed more by what was not in the literature than what was present. Examples of more patient engagement found in the literature focused on the partnership approach:

Becoming patient responsive may be associated with error prevention and a strong organisational safety culture. There is a link between increased collaboration between clinicians and patients and a number of positive outcomes of care (Howe, 2006, p. 527)

and

involving the patient in clinical decisions.....and attest to the significance accorded to the patient's own preferences in health care delivery. The result may be a form of partnership between the patient and health care delivery (Infante, 2006, p.523).

It is fair to say though that reference to the patient's role in their care was usually absent. Therefore, asserting the role of the patient's position in the health care team is an emergent theme. One would argue however, that a focus on broader patient participation would generate interest in indicators of patient safety that extend beyond the biomedical paradigm of mortality rates and length of hospital stay. There is some way to travel however, which is evident by:

Professional defensiveness is a major cultural barrier to patient empowerment – professional resistance, emotional distancing and negative attitudes can significantly reduce the effectiveness of patient's involvement (Howe, 2006, p. 528)

and

.....there are also cultural differences in different health disciplines, which may make patient centeredness as problematic as interprofessional working (p. 528).

Patient safety and the patient's role in their own care have been explained as themes within the literature analysis. The inclusion of patient safety and the patient's position in care represents the core value that patient's hold within health professionals.

However, what is common within each illustration is that progress towards the goals of improved patient safety and patient participation is being progressed through collaborative working. Logically, any barriers to how health professionals work together will ultimately affect patients. This leads onto the third theme identified – that of the influence of professional silos on interprofessional practice and patient safety.

The influence of professional silos on interprofessional practice and patient safety.

The impact of professional silos on interprofessional collaboration and patient safety was the third main theme identified. Barriers to collaborative working and safe patient care were commonly referred to across most articles. Professional silos are defined as barriers that exist that cause people who are supposed to work together to instead, work against each other (Shirey, 2006). Professional silos were universally considered a barrier to the progress of interprofessional collaboration and patient safety initiatives:

Achieving true collaboration is difficult because we must first conquer the professional silos that exist in the workplace and preclude the health care team from achieving desirable common goals (Shirey, 2006, p. 229)

and

professional silos can manifest themselves in the form of fragmented care that increases the risk of medical errors (Shirey, 2006, p. 229).

As all of the articles were about interprofessional collaboration and patient safety, this theme was found, to a greater or lesser extent within each article's background context. What was noticed was that whilst professional silos was a dominant theme the emphasis differed slightly depending on the focus of the article. For example, where there was more of a focus on patient safety professional silos were a barrier to effective communication which led to greater risk to patients:

....it is human factors and sub-optimal team cooperation that lead to disasters (Krykjebo et al., 2006, p. 508)

and

....suboptimal communication and teamwork contribute to patient errors and impact substantially on patient safety and the efficient use of resources (Weller et al., 2011, p. 479

and

Traditional models of care in which professionals and departments practice more or less in silos can increase patient risk and reduce quality of care (Sargeant, 2009, p.178).

However, where the focus was more on interprofessional collaboration or interprofessional education the emphasis on professional silos as a barrier was more on the health professional. The impact on patient safety was less evident:

Interprofessional hierarchies had considerable (negative) bearing on communication and collaboration (Rice, et al., 2010, p. 358)

and

The well-entrenched hierarchical authority structure and sexism..... complicate nurse-physician communication (Robinson, et.al, 2010, p. 207).

Also from Robinson:

Given that we educate health professionals in silos, it is not surprising that they graduate and enter practice not understanding each other's unique perspectives and unable to communicate effectively with each other (p. 214).

Overall, the impact of professional silos was inevitably linked with a greater risk and threat to patient safety through inconsistent approaches to care:

Many barriers to successful interprofessional collaboration exist, including problematic power dynamics, poor communication patterns, poor understanding of roles and responsibilities resulting in boundary infringements, and conflict due to differences in approaches to patient care (Rose, 2011, p .6).

When interprofessional collaboration was explored further, it was as an alternative to the current traditional model of care and a preferred way forward. Clearly, the current model of practice was considered counterintuitive when compared to interprofessional collaboration (Headrick & Khaleel, 2008). As a result, the current and future models of care were inevitably compared and contrasted. This was useful as the tension between the

current traditional model of care and interprofessional collaboration are seen to be on opposite sides of the same coin (Reeves et al., 2008):

Successful collaboration is not achieved easily, however and barriers such as professional divisions and hierarchies, stereotyping and differing value systems have been widely reported (Miers & Pollard, 2009, p. 31).

Also

Differences in professional culture can challenge collaboration making philosophical convergence difficult to achieve so that instead of increasing operational efficiency, stalemate ensues (Wakefield, et al., 2009, p. 24).

In some articles, this tension between professionals operating in silos took on a darker tone using words that describe conflict and aggression that was evident within professional competitiveness:

.....we must first conquer the professional silos (which have been described as) the antithesis of turf wars (Shirey, 2006, p. 230)

and

Turf issues of professional scopes of practice (Angeline, 2011, p. 3).

Cultural marginalisation can hinder people from speaking up (Howe, 2006, p. 528)

and

A fundamental fact of professional life is interprofessional competition. It is the history of this competition that is the real, determining history of professions (Reeves, Macmillan & van Soeren, 2010, p. 261).

Therefore, having a well developed understanding about the impact of professional silos on the progress towards interprofessional collaboration and improved patient care is useful. However, in the context of a traditional health care model of care this theme has been widely reported (Miers & Pollard, 2009). The theme of professional silos is noted to be separate from that of an individual within professions to a broader strategic, systematic and theoretical view:

Boundary frictions, hierarchial imbalances and power/status inequities...take place within a broader, complicated socio-historical context. (Reeves, Macmillan & van Soeren, 2010, p. 259)

and

The construction of a new broader system approach to patient safety challenges the prevalent biomedical paradigm but, more importantly, it challenges medical power (Infante, 2006, p. 523)

and

....a collaboration strategy that is effective in dismantling professional silos (Shirey, 2006, p. 230).

This broader approach is important as professional silos are politically and economically entrenched and stubbornly resist change towards a different model (Reeves, Macmillan, & van Soeren, 2010):

(There is)...a growing evidence base which has provided empirical insight into the problematic nature of interprofessional teamwork and collaboration (Reeves, Macmillan & van Soeren, 2010, p. 262).

Consequently, whilst professional silos are a dominant theme within the interprofessional collaboration and patient safety literature, different aspects of the impact of professional silos are revealed. Articles provided an outline of the negative impact of professional silos on collaborative practice, which had a flow on impact on safe patient care. In many cases, the emphasis then shifted to how this problematic theme could be influenced at a strategic and theoretical level. This takes us forward to the next key theme which refers to the evolution of a theoretical framework. It is argued that a theoretical foundation better supports the progression of interprofessional collaboration and patient safety in practice.

The development of a theoretical framework.

The development of a theoretical framework is a dominant theme in that many authors identified this as a way to promote theoretical understanding and move beyond barriers. There was a sense that without this approach, health professionals would remain in a state of inertia. Sargeant (2009), for example states that:

It is proposed that achieving improvement will take a transformation in our way of thinking and educating, not just a tweeking around the edges of what are now doing (p. 178).

Sargeant goes on to support the theoretical perspectives of social psychology (exploring the interaction between individuals and their life situations) and complexity theory (shift in focus towards the broader health team, health system and environment). Aligned with this view, Infante (2006) is emphatic in her support of this approach by stating:

The systemic approach is one of the fundamental links between patient safety and interprofessional work (p. 517).

This view advocates a shift from person and individual error (and blame) to systems and safety. Hence, this broader approach lends itself to being guided by a theoretical foundation and methodology that informs any subsequent enquiry.

It is also evident that the nature of interprofessional collaboration and patient safety enquiry is introduced in a variety of ways. For example, Shirey (2006) suggests a framework to dismantle professional silos. The first step in this 4-step strategy of collaboration is to establish a thematic goal:

....refers to identifying a single qualitative focus that is shared by the entire organisation (p. 230).

This focus is followed by steps to identify measurable targets, metrics or indicators that will reflect measures of success:

It is important to recognise up front that both tangible (quantitative, explicit) and intangible (qualitative, implicit) outcomes may be equally valuable and these collectively contribute towards organisational success and sustainability (p. 230).

Therefore, we can see how using frameworks is important to the emphasis away from the individual to a broader, theoretical, systems approach to interprofessional collaboration and patient safety. Another example of this is the root causes analysis process supported by Wakefield et al., (2008):

Interprofessional working was seen as a particularly valuable element of the RCA (root cause analysis) learning programme (p. 24).

Whilst some authors took a more focused, specific framework approach, Reeves et al., (2008) refers to taking a sociological perspective to understand how interactions

influence broader organisational order. Reeves argues that this is necessary in order to find a new path to challenge and address the impact of working in professional silos:

The web of structural factors such as professional power and gender that must be modified to find this new level of collaboration is not going to make this an easy path (p. 2).

What Reeves is delving into here is the level of complexity that lies behind interprofessional collaboration and patient safety. It is suggested that these complexities which include team membership, fluidity, shift rotation and multiple types of communication, may have been oversimplified (Varpio, Hall, Lingard, & Schryer, 2008). Consequently, the adoption of a theoretical framework to revise these complexities is one way to reverse the slow progress of understanding linkages between interprofessional collaboration and medical error:

To meet this goal requires a reframing of analytic approaches and or research questions as they have traditionally been structured within the medical domain (Varpio, Hall, Lingard & Schryer, 2008, p. S77).

Two analytical approaches suggested by Varpio et al., (2008) are activity and knot working theory. Activity theory is the conceptualisation of the social interactions and relationships involved in interprofessional health care practices. Within activity theory is knot-working i.e., the analysis of the complexities behind different professionals entering into the care team at different times. Thus, Varpio et al. supports a qualitative, social science approach to examine the question of interprofessional and patient safety complexity. This was found to be further supported by Jones and Jones (2011) who state:

The use of qualitative research methods could be particularly useful for exploring complex issues, eliciting opinions and identifying interprofessional relationships and structures that are difficult to identify (p.175)

and

Theoretical argument should be articulated linking aspects of the structure, process or intermediate outcomes of collaboration with quality of care outcomes (p.49) (Suter et al., 2009).

These examples demonstrate how the theme of a developing theoretical framework supports our understanding of the complexities behind collaborative practice and patient safety. Considerable support is growing in recognition that a theoretical approach will help

health professionals, at a strategic level, to understand the identified barriers and develop credible, evidence based solutions.

Consistent with a strategic view of interprofessional collaboration and how this affects patient safety is the final theme that situates interprofessional activity on a continuum. This emphasises that the issues of patient safety, outcomes, and extent of collaborative practice occurs in a variety of contexts, which cannot be considered in isolation of one another.

Interprofessional activity expressed on a continuum.

This theme suggests that interprofessional collaboration and patient safety are outcomes, which cannot be viewed in isolation from how health professionals develop the competencies to learn to work collaboratively. This is evident both at undergraduate and postgraduate level and reflects the overlap between learning how to work collaboratively, the interpersonal competencies required and the impact this has on collaborative practice. This is best described by Reeves (2009) who refers to interprofessional activities that can be seen as an ongoing process of learning and working:

Interprofessional education, continuing interprofessional education, interprofessional collaboration, and interprofessional care are emerging activities to help reform the delivery of health professionals education and health care practice (p.145).

Whilst Reeves provides the broadest description, the themes of interprofessional activity as a continuous process was clearly evident:

Interprofessional learning is additive and reflects a continuum of learning.....The level of interprofessional competence is dependent on the depth and breadth of opportunities for education and practice with, from and about other disciplines (Bainbridge et al., 2010, p. 8)

and

It is argued that no single teamwork-training course can alter attitudes and change in work culture can only be achieved through repetitive training (Gum et al., 2010, p. 3).

Thus, what has emerged is acknowledgement that interprofessional collaboration is an outcome of interprofessional learning, which can be expressed on a continuum of

learning (Angeline, 2011; Headrick & Khaleel, 2008). This is important to understand in order to assist residual ambiguity about when and where interprofessional skills are best learned:

Skills in interprofessional collaboration are needed, but we have not yet established the best way for health professionals in training to achieve those skills (p. 371).

Broad consideration of interprofessional collaborative practice expressed on a continuum is a theme that aligns well with the earlier theme of adopting a theoretical framework. This suggests that it is important that interprofessional education, practice and interprofessional organisational interventions as a whole are examined using appropriate methodology:

This broader approach is reflective of the ongoing developments in research, practice and policy in this field (Zwarenstein et al., 2009, p. 4)

and

interprofessional education is build on social and experiential learning and theoretical perspectives that inform these phenomena are needed (Sargeant, 2009, p. 179).

In summary, this theme suggests that interprofessional collaboration and patient safety are outcomes of collaborative practice competencies that are learned over time.

Thus, all themes presented are interconnected and form a vision of safe, patient focused outcomes provided by an interprofessionally competent health professional workforce. Barriers to this vision lie in professional silos that endure however, the development of a theoretical framework of that recognises collaborative practice as a fluid aspect of lifelong learning is a strategic way forward.

Chapter Six

Discussion

This final chapter discusses the significance of the major themes, and considers how they contribute to the analysis of the relationship between interprofessional collaboration and patient safety. In addition, issues identified in the general literature review are revisited to reflect on similarities and differences between the two reviews. The discussion focuses on the three research questions that form the heading for each section. That is:

- What are the relationships between interprofessional collaboration and patient safety?
- How does the interprofessional collaborative model of health care delivery support patient safety?
- How can interprofessional collaborative practice and patient safety be progressed in practice?

Implications and recommendations for practice are highlighted within each section and summarised in the conclusion. Limitations of the study are identified and future prospects for ongoing research are suggested. The chapter opens with an analysis of the first research question.

What are the Relationships between Interprofessional Collaboration and Patient Safety?

In this research, it is clear that the relationships between interprofessional collaboration and patient safety are broad. One outcome of this is that the association between these topics is generalised and very often assumed. This results in fragmentation whereby the linkages between these two significant concepts is undeveloped (D'Amour et al., 2005). Poorly developed concepts are further compounded by an imbalance in how interprofessional collaboration and patient safety are reported on.

Because these topics are broad, when interprofessional collaboration and patient safety are viewed together, analysis is generalised. Mostly, each topic is analysed separately whereby articles on interprofessional collaboration and patient safety are

predominantly about either one or the other. Few authors commented on the interrelationships between them. Jones and Jones (2011) are an example, as in their interprofessional team working intervention, they found a correlation between teamwork and improved patient safety. Despite this outcome, in that study, the dominant emphasis still focuses on interprofessional working. Other than noting a change in adverse event reporting, the patient safety aspect of the study receives little attention. Alongside this, the reference to interprofessional ways of working and teamwork lacks definition, thus contributing to generalisation and assumption about how these terms interrelate. While patient safety is an agreed driver for change (Weingart et al., 2011) insufficient attention is given to linking how specific interprofessional interventions improve patient safety.

This imbalance between interprofessional collaboration and patient safety is perpetuated because the concepts are used broadly which makes understanding of any relationship between the concepts more difficult. For example, interprofessional collaboration is often referred to as teamwork (Suter et al., 2009). This is true although this description is too broad to penetrate the complexities that affect individual and collective responsibility to communicate collaboratively. A similar argument is noted in regard to patient safety, in that adverse events are reported to occur because of ineffective teamwork and communication breakdowns (Nisbet et al., 2011). This is also true even though this knowledge has not significantly challenged the way people work together. Thus, the persistent imbalance of reporting, breadth of topics and oversimplification of the complexities that surround the context, organisational and professional cultures, means that initiatives to promote explicit relationships between interprofessional collaboration and patient safety are at risk of failure (Greenfield, Nugus, Travaglia, & Braithwaite, 2010). Clearly, if this persistent theme continues, strategies to integrate interprofessional collaboration and patient safety are likely to remain elusive.

Taking into consideration the broad relationship, the consequent fragmentation and reporting imbalance between interprofessional collaboration and patient safety topics, it makes sense that one solution to resolve the issues between these concepts are to explicitly integrate them in research. Therefore, the first recommendation is that:

- Future research needs to demonstrate how interprofessional safety interventions improve patient safety.

How does the Interprofessional Collaborative Model for Health Care Delivery Support Patient Safety?

It also stands out in this research that patient-focused care does not drive patient safety initiatives. Therefore, although interprofessional collaboration and patient safety are supposedly patient centred, the patient is largely ignored in the analysis. It is important to note that, when looking at ways of working together and patient safety outcomes, there is a significant absence of the patient's perspective and voice (D'Amour et al., 2005; Fowler, Levin, & Sepucha, 2011). Given that the patient is the focus of healthcare and bears positive and negative consequences of treatment, this situation is counterintuitive. Therefore, one way that interprofessional collaboration supports patient safety is to make explicit the role of the patient as a member of the interprofessional group, thus raising the profile of the patients in their own care.

The absence of the patient's voice is even more surprising, as awareness is growing that the patient wishes to play an increased role in the management of their own healthcare (Nisbet et al., 2011; Weingart et al., 2011). Nisbet argues that this can occur if the health professional works alongside the patient sharing information, negotiating care and working partnership. In this model, the patient is an integral member of the health care team. However, when the everyday relationships between the patient and health professionals are considered, it is evident that they more than likely mirror the traditional model of health care delivery. For example, in the uni-professional, traditional model, care is linear. This means that care is organised around each separate profession first before the wider professional team is considered. As a result, each group tends to engage with the patient individually. Consequently, care is co-ordinated along professional, hierarchical lines rather than integrated around the patient (Crofts, 2006). In this scenario the patient's participation in their care is passive, with the patient often becoming the only link between members of the multidisciplinary care team (Meads, Ashcroft, Barr, Scott, & Wild, 2005). Not surprisingly, the patient's active role in their care is more of a struggle as they negotiate

a care delivery system they are unfamiliar. In this scenario, the patient's perspective is more at risk of being lost (Crofts, 2006). Patient safety is at greater risk because safe care is a product of the interaction between patients and families and health care providers (Weingart et al., 2011). Under this model, patient safety outcomes have focused on traditional measures largely external to the patient. The emphasis has been more on the control of the health professional, e.g. mortality rates, hospital length of stays, hospital acquired infection and cost (Vincent, Neale, & Woloshynowych, 2001).

Clearly, modern organisational expectations are challenging. In particular, they challenge an interprofessional collaborative model that is supposedly a partnership negotiated with all members of the care team. The patient, as an owner of their health, is at the centre of this relationship. This is important, because progressive healthcare is more patient and community centred (Barr, 2007; Meads et al., 2005). Therefore, it is logical that the patient and sometimes family, who are the ones who will live with the value, benefits and risk of treatments', are equally involved in decision making (Fowler et al., 2011). Interestingly, Fowler, Levin and Sepucha observe that the only clinically appropriate treatment is that which has had the full discussion and participation with the patient. In their view, to not have achieved this point is just as serious as any adverse event.

Consistent with the call for an increased patient's participation in care, future patient outcome measures also need to change. These measures could focus on, for example, patient satisfaction (Sidhu, Berg, Endicott, Santulli, & Salem, 2006) and perhaps, as Fowler, Levin and Sepucha (2011) have suggested, the impact of interprofessional working on patient choices. This approach is less likely to make assumptions about the ways that patient safety is compromised and understand the impact of collaborative practice on patient's experiences of their own care. This is important, because it is argued that patient safety struggles to be heard in a meaningful way because it is over generalised and not specific (D'Amour et al., 2005). In summary, interprofessional collaboration is a model of health care delivery that repositions the patient into the centre of the care team. This repositioning has the potential to improve patient safety (Howe, 2006; Nisbet et al., 2011). To achieve this aim, more attention needs to be given to clarifying the patient's role as a member of the interprofessional team. To progress this, the recommendation is that:

- The patient's voice is heard through participation in qualitative research.

How Can Interprofessional Collaborative Practice and Patient Safety be progressed in Practice?

The third research question in this study aimed to clarify how interprofessional collaboration and patient safety could be progressed in practice. From the previous discussion, it is argued that the patient is the catalyst to promote this change. Reviewing the patient's position in their care illustrates how the model of care mirrors the patient's position in the team. From this, one can appreciate how an interprofessional model of care can give voice to the patient's experience. In addition to this, findings from the general literature review (discussed in Chapter Two) identified how other aspects of an interprofessionally collaborative model of care supports patient safety. This includes a more responsive solution to increased health complexity (Nisbet et al., 2011; Norris et al., 2003), workforce shortages (WHO, 2010) and to crisis (Meads et al., 2005). Collectively, authors have accepted these issues as established drivers that support the rationale for change, not to mention as evidence supporting a collaborative model of health care delivery. Therefore, if interprofessional collaborative practice and patient safety are to be progressed together in practice, a process integrating the major issues discussed is required to ensure there is a united direction for action. Two aspects that will help achieve this are firstly using a broader theoretical base in research and development of a new, integrated model of interprofessional collaborative practice and patient safety. These are explored further.

Broad theoretical base.

This integrative review identified examples and rationale for a theoretical framework that explores the relationships between interprofessional collaboration and patient safety. What is noted is how a differing theoretical perspective reflects the complexity of context and social construction that underpins interpretations of these topics. For example, one framework used to explore building a patient safety culture focuses on overall strategy, infrastructure, organisational environment and care outcomes (Frankel, 2006). This

approach is similar to others that include context, culture, attitudes, conduct and information (Greenfield et al., 2010; Hofoss & Deilkas, 2008). From this, it is evident that researchers are using a theoretical approach expressed in frameworks in order to explain the interrelationship of concepts (Holloway, 1997). The use of a theoretical framework to explain the interrelationship between interprofessional collaboration and patient safety reinforces the argument that advanced understanding about these topics is less likely using a purely quantitative approach. Qualitative data is also needed as health professionals work in collective environments involving constant and varied interactions that also need explanation (D'Amour et al., 2005). Earlier evidence has already identified that there is a historic medical bias towards a quantitative methodology by the dominant medical profession. Because of a persistent preference for this perspective in research, this may be, in part, one explanation for why progress between interprofessional collaboration and patient safety has stalled. Consequently, a broad theoretical base that encompasses cognitive, behavioural, scientific and technological aspects is the most appropriate direction for the future (Fowler et al., 2011; Shojania, Wald, & Gross, 2002). Put simply researchers need to select the most appropriate theoretical perspective and methodology for the research question that examines the relationship between interprofessional collaboration and patient safety.

Despite the call for a broad theoretical base, similar messages, similar themes and messages are conveyed across most of the articles reviewed. Therefore, the findings of this research provide substance in the form of themes that can be considered collectively transferable and credible. Furthermore, if research trustworthiness is to be improved reporting must be rigorous and meet the requirements of quality evaluation. This is a necessary step to improve poor evaluation outcomes.

Therefore, recommendations supporting wide-ranging research are as follows:

- That there is congruence between the theoretical perspective, methodology and the explicit research question.
- That research design is rigorous and follows an explicit reporting framework.

A Model of Interprofessional Collaboration and Patient Safety.

This section explores the recommendation for a theoretically informed integrated model of interprofessional collaboration and patient safety. The intent is to present a model that might assist organisations to evaluate their development in this area of practice. The development of a model provides opportunity to integrate the research findings that have been identified. While most health professionals and organisations would believe that they already work collaboratively and communicate effectively (Crofts, 2006; Greenfield et al., 2010), this literature review paints a different picture. Therefore, a model of interprofessional collaboration and patient safety evaluation would enable organisations and health professionals to evaluate their baseline situation and opportunities for development. Therefore, this section integrates components of a possible interprofessional collaboration and patient safety evaluation model. These components include the foundation of a continuum, interprofessional learning, principles of adult skill acquisition and patient safety research. Figure 4.0 summarises the combination of these aspects.

The basis for the model is the expression of interprofessional and patient activity on a continuum. The concept of a continuum is supported by (Barr, 2007) who describes overlapping progression of interprofessional learning as preparing individuals for collaborative practice, learning to work in teams before developing services to improve care. D'Amour et al. (2005) is more specific about how collaborative practice is described on a continuum of professional autonomy. That is, at one-end professionals work in parallel, with a greater degree of autonomy and independence. At the other end of the continuum, there is less professional independence but a greater team autonomy and integration. Consequently, the descriptions offered by these authors align to the theme about how interprofessional education and collaborative activity is shown to be a continuous and integrated process.

These descriptions provide support for a continuum that forms the basis of a future model of interprofessional collaboration and patient safety activity. Another advantage to this approach is that, viewed on a continuum, a continuum can help position interprofessional activity into different contexts of undergraduate and postgraduate learning. This contrasts with education and practice occurring in professional silo's which

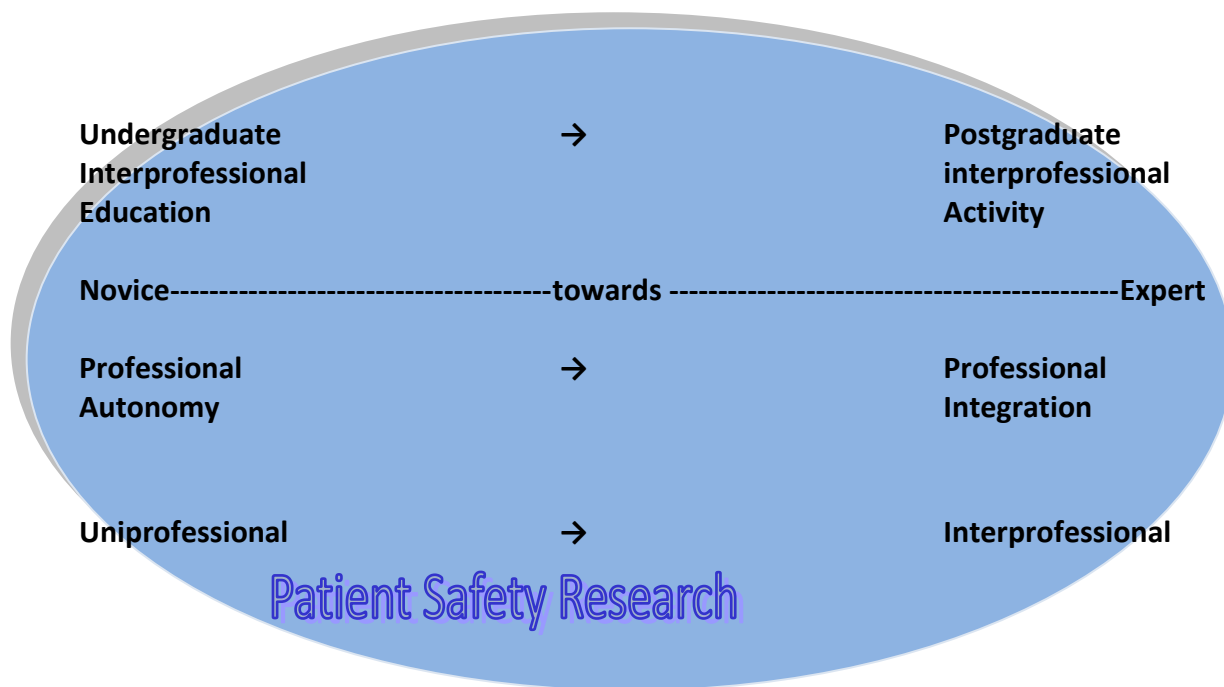
has been identified as a dominant feature of current models of health care. Thus, if interprofessional learning is considered on a continuum, learning in a professional silos needs to be changed. For example, there are professional specific outcomes that are learnt unprofessionally which are important skills and knowledge specific to the particular discipline. However, there are a range of skills that are more generic and common to most health disciplines (Thistlethwaite & Moran, 2010). It is this range of skills that are the focus of interprofessional learning, which can help break down the barriers of professional silos.

As part of interprofessional activity viewed as a continuous learning process, the principles of adult skill acquisition can be applied and integrated into a model of evaluation (Dreyfus, 2004). These principles are described as five stages that range from novice, advanced beginner, competence, proficiency to expertise. Whilst detailed description of these stages is beyond the scope of this review, they demonstrate how skill acquisition begins with a more limited, analytical task focus, extending to an experienced, situational and intuitive response. These five states of adult skill acquisition are consistent with what is reported about the integrated and continuous way that health professionals learn to work collaboratively.

Whilst it is understood that patient safety research has developed largely in isolation of interprofessional activity, patient safety and the role of the patient in collaborative activity forms the central context of an integrated model. Therefore, alongside the explanations about interprofessional activity, patient safety research has been summarised into three aspects. The first aspect focuses on specific investigation of adverse event cases using processes such as quality protected meetings, and root cause analysis frameworks. The second aspect looks to the how service is delivered to patients that is reviewed on a system rather than individual basis. Thirdly, the culture of the organisation is an important aspect of how patient safety and error management is viewed (Hofoss & Deilkas, 2008). Consistent with the need to keep patient safety at the centre of health care delivery, patient safety forms the context of the model. In summary, what is described here is how components that reflect identified analysis themes can be integrated. This is necessary to bring together the identified themes and issues into a common direction that may progress in practice how interprofessional collaboration supports patient safety. This forms the basis

of the recommendation for future development towards a model of interprofessional collaborative activity in a context of patient safety research. Thus:

Figure 4.0 Integrated Model of Interprofessional Activity and Patient Safety



The direction towards this recommendation is supported by an example from Greenfield et al. (2010). Greenfield promotes an interprofessional praxis audit framework whereby organisations can evaluate how interprofessional learning and practice are promoted and implemented. The purpose for an evaluation process would be to make visible the extent of interprofessional activities and make transparent development opportunities that promote collaboration and enhance understanding of interprofessional activities by health professionals. This approach is useful because it is a theoretically informed process whereby organisations could perform assessment against variables such as evaluation of the organisational context, culture (shared values and norms), conduct (behaviour), attitudes (beliefs values and philosophies), and information. It is also identified that similarities exist between this conceptual model and the model of health and information systems (Figure 1.0) that is offered by the World Health Organisation (2010). What is important here is that there is a strategy to integrate interprofessional collaboration and patient safety. This begins with a model of development to support health care

organisations to evaluate the extent that interprofessional collaboration and activity occurs within a context of patient safety.

With this in mind, it is recommended that this early model development may form the basis for an integrated evaluation framework. Therefore, organisations and health professionals will be able to assess the maturity of interprofessional collaboration in their own practice settings. This framework would include evaluation against specific patient safety measures. In summary, the final recommendation is that:

- A model of interprofessional collaborative activity in a context of patient safety be developed.

Summary of Recommendations and Implications for Practice

Recommendations from the analysis of this integrative review promotes integration between interprofessional collaboration and patient safety are:

- Future research needs to demonstrate how interprofessional safety interventions improve patient safety.
- The patient's voice is heard through participation in qualitative research.
- That there is congruence between the theoretical perspective, methodology and the explicit research question.
- That research design is rigorous and follows an explicit reporting framework.
- A model of interprofessional collaborative activity in a context of patient safety be developed.

Future Research

Future research opportunities can integrate these recommendations to ensure that research is methodologically congruent, rigorous and patient centred. The key aspect is the integration between interprofessional and patient safety. To achieve this goal, emphasis in future research could expand on the early model development identified in this review. This

ensures that interprofessional education, interprofessional practice, levels of proficiency and organisational context move forward, but remain embedded in a context of patient safety.

Limitations

This review is dominated by literature that has a professional focus on doctors and nurses. Other allied groups such as pharmacists, social workers, physiotherapists and occupational therapists are less visible. This has not been a deliberate strategy of the literature search. However, as I am a registered nurse, this limitation may have been informed by my professional knowledge and resultant bias. Interestingly, one reason given for this professional imbalance found in the literature, is that the status of medical professionals and the size of the nursing workforce has drawn attention towards these two major professional groups (Rose, 2011). Another assumption offered is that collaborative working is focused on the professionals who are the most physically present at the point of care delivery (Seavey, 2010). Despite this, it is argued that the findings of this integrative review have relevance and are transferable to other professionals and their practice. This is because the best opportunity to improve collaborative practice and improve patient safety is to include wide stakeholders (K. Thompson, 2003). Furthermore, it is accepted that successful collaboration is a key principle for creating safer systems in healthcare (Holden, Watts, & Walker, 2010).

A second limitation is publication bias that may be present due to an electronic data base search (Whittemore, 2005). Publication bias occurs when the most significant research findings are the ones that tend to be published. Conversely, studies that did not result in strong or expected outcomes may not be published. Potentially this could result in an imbalance of reported outcomes, which may over estimate the relationship between research variables and outcomes.

The third limitation relates to the knowledge that patient safety and outcomes are poorly conceptualised. Because of this, in the context of many hundreds of articles in the electronic databases that refer to patient outcomes, the sample size for this review may be

considered insufficient. Therefore, there is a high degree of transparency in this review about literature search strategies, numbers of selected studies and specific article detail (appendix A). This has been included so that this level of transparency can respond to questions raised about the sample size.

Lastly, there may be bias towards the themes that were identified firstly in the general literature review. This is because the same author has completed both pieces of work. However, the methodological approach to these pieces of work are quite different and the process of supervision has moderated the extent of this bias impacting upon the outcomes of this integrative review.

Conclusion

It is clear from this review that interprofessional collaboration and patient safety are broad topics that are complex in their own right. While they are seldom viewed together, the lack of integration between these two interrelated topics is important because patient safety is affected by how health professionals work together. In reality, these two concepts are inter-related. Therefore, it is important that they are viewed together so that collaborative practice can be developed so that it positively influences safe patient care. To analyse further the relationship between these two concepts, this integrative review argued that the lack of integration between interprofessional collaboration and patient safety topics results in barriers to a specific way forward that guides how collaborative practice can positively influence safe patient care. Future improvements need to focus on integrating the two topics, so that service delivery may be improved for patients. The establishment of a broad theoretical base for future study will go some way to begin this process as will the identification of a model for interprofessional collaboration and patient safety.

Development of a model that integrates interprofessional collaboration and patient safety ensures key concepts of a theoretically informed process reflects the continuous nature of interprofessional practice that is retained in a context of patient safety. There is much work to be done in this vital area of practice that is critical to improve health and social outcomes

Appendix A

Summary of Data Sample - Literature that Fulfils Inclusion Criteria

Author	Title of Article	Inclusion Criteria	Where Found	Type of Article	CASP Appraisal Tool Applied
(Anderson et al., 2009)	Medical students benefit from learning about patient safety in an interprofessional team	Patient safety Interprofessional collaboration	Title	Mixed method comparative analysis	Yes
(Gum et al., 2010)	Clinical simulation in maternity (CSiM): interprofessional learning through simulation team training	Patient Safety Interprofessional relations	Abstract	Qualitative thematic inductive analysis	Yes
(Jones & Jones, 2011)	Improving teamwork, trust and safety: An ethnographic study of an interprofessional initiative	Interprofessional team work Patient safety	Keywords Introduction	Qualitative ethnographic study	Yes

Author	Title of Article	Inclusion Criteria	Where Found	Type of Article	CASP Appraisal Tool Applied
(Kyrkjebø & Hage, 2005)	Improving patient safety by using interprofessional simulation training in health professional education	Patient safety Interprofessional collaboration	Keywords Body of article	Qualitative thematic evaluation of pilot study	Yes
(McGrail et al., 2009)	“What is found there”: Qualitative analysis of physician–nurse collaboration stories	Collaboration Patient Safety	Title Abstract	Qualitative narrative analysis	Yes
(Miers & Pollard, 2009)	The role of nurses in interprofessional health and social care teams	Interprofessional health and social care collaboration. Danger to patients	Introduction Body	Qualitative thematic analysis of interview data	Yes
(Rice et al., 2010)	An intervention to improve interprofessional collaboration and communications: A comparative	Interprofessional Collaboration Patient Safety	Title, abstract, keywords	Comparative ethnographic qualitative study	Yes

Author	Title of Article	Inclusion Criteria	Where Found	Type of Article	CASP Appraisal Tool Applied
	qualitative study				
(Robinson & Cottrell, 2005)	Perceptions of effective and ineffective nurse-physician communication in hospitals	Patient safety Interprofessional communication Collaboration	Abstract	Qualitative focus group thematic analysis	Yes
(Suter et al., 2009)	Role understanding and effective communication as core competencies for collaborative practice	Interprofessional collaboration Patient harm Adverse clinical events	Title Abstract Body	Qualitative inductive content analysis using semi structured interviews	Yes
(Wagner et al., 2011)	Developing interprofessional communication skills	Interprofessional collaboration	Abstract	Pilot study of teaching simulation exercise	Yes

Author	Title of Article	Inclusion Criteria	Where Found	Type of Article	CASP Appraisal Tool Applied
		Patient Safety			
(Wakefield et al., 2009)	Patient safety investigations: the need for interprofessional learning	Patient safety Interprofessional learning Collaborative	Title Abstract	Mixed method impact evaluation	Yes
(Weller et al., 2011)	Interprofessional collaboration amongst junior doctors and nurses in the hospital setting	Interprofessional collaboration Patient safety	Title Abstract	Qualitative analysis of semi structured interviews	Yes
(Zwarenstein et al., 2009)	Interprofessional collaboration: Effects of practice-based interventions on professional practice and healthcare outcomes.	Interprofessional collaboration Patient Safety	Title Background	Systematic Review from Cochrane	Yes
(Angeline, 2011)	Interdisciplinary and	Interprofessional	Keyword	Discussion/Commentary	No

Author	Title of Article	Inclusion Criteria	Where Found	Type of Article	CASP Appraisal Tool Applied
	interprofessional education: What are the key issues and considerations for the future?	Collaboration Patient Safety	Body of article		
(Bainbridge et al., 2010)	Competencies for interprofessional collaboration	Interprofessional Collaboration Patient Safety	Title Abstract	Descriptive overview of competency framework	No
(Headrick & Khaleel, 2008)	Getting it right: Educating professionals to work together in improving health and health care	Interprofessional collaboration Patient safety	Abstract	Commentary based on content of lecture	No
(Howe, 2006)	Can the patient be on our team? An operational approach to patient involvement in interprofessional approaches to safe care	Patient Safety Interprofessional working	Keywords Abstract	Discussion/commentary	No

Author	Title of Article	Inclusion Criteria	Where Found	Type of Article	CASP Appraisal Tool Applied
(Infante, 2006)	Bridging the "system's" gap between interprofessional care and patient safety: Sociological insights	Interprofessional Care Patient Safety	Title, abstract, keywords	Discussion/commentary	No
(Kearney, 2008)	Facilitating interprofessional education and practice.	Collaborative care Patient safety	Abstract	Commentary	No
(Kerfoot et al., 2006)	The power of collaboration with patient safety programs: building safe passage for patients, nurses, and clinical staff	Collaborative practice Patient Safety	Title	Commentary	No
(Reeves et al., 2008)	The doctor-nurse game in the age of interprofessional care: a view from Canada	Patient safety Interprofessional collaboration	Introduction	Editorial	No
(Reeves, 2009)	An overview of continuing	Interprofessional	Abstract	Descriptive overview	No

Author	Title of Article	Inclusion Criteria	Where Found	Type of Article	CASP Appraisal Tool Applied
	interprofessional education	Collaboration Patient Safety	Keywords		
(Reeves et al., 2010)	Leadership of interprofessional health and social care teams: a socio-historical analysis	Interprofessional teamwork Team collaboration Safe care	Title Abstract	Commentary	No
(Rider & Brashers, 2006)	Team-based learning: a strategy for interprofessional collaboration	Interprofessional collaboration Patient safety	Title Abstract	Editorial	No
(Rose, 2011)	Interprofessional collaboration in the ICU how to define?	Interprofessional collaboration	Title, Abstract	Discussion/Commentary	No

Author	Title of Article	Inclusion Criteria	Where Found	Type of Article	CASP Appraisal Tool Applied
		Patient safety/inadvertent harm	Body		
(Sargeant, 2009)	Theories to aid understanding and implementation of interprofessional education	Interprofessional collaboration Patient safety	Abstract	Discussion/Commentary	No
(Shirey, 2006)	On intrapreneurship: from silos to collaboration	Collaboration Patient safety	Title Abstract	Discussion	No
(Varpio, Hall, Lingard & Schryer, 2008)	Interprofessional communication and medical error: A reframing of research questions and approaches	Interprofessional communication Medical error Patient safety	Title Abstract Introduction	Commentary	No

Appendix B

Critical Appraisal Evaluations for each Research Articles Identified in Appendix A

Screening Questions	Interprofessional collaboration: Effects of practice-based interventions on professional practice and healthcare outcomes. (Zwarenstein et al., 2009) (Links to patient safety in background).
Systematic Review	
Did the review ask a clearly-focused question?	Partial. The review aim was clear to synthesise RCT evidence on practice-based interprofessional collaborative interventions however the review objective was much broader and thus became ambiguous. ^(1/2)
Did the review include the right type of study?	Yes – Cochrane review focuses on RCT's as methodology. However, it is worth noting that there are more qualitative studies than quantitative in this subject area. ⁽¹⁾
Detailed Questions	
Did the reviews try to identify all relevant studies?	Yes – electronic data base search of relevant keywords that captured all available studies. ⁽¹⁾
Did the reviewers assess the quality of included studies?	Yes – 1128 abstracts reviewed independently by authors. Focus was only on RCT's so final number of eligible studies small (five). ⁽¹⁾
If the results of the studies have been combined, was it reasonable to do so?	Yes. Inclusion and exclusion criteria stated. The study results were not combined. Search methods and criteria were explicit in the review. ⁽¹⁾
How are the results presented and what is the main result?	Due to small number of eligible studies the results were presented in narrative format. ^(1/2)

How precise are these results?	Only one study was reported against so whilst results were precise, they were limited. ^(1/2)
Can the results be applied to the local population?	Only one study was of high enough quality to have the results described. The authors have concluded that little is known about the processes of collaboration and its contribution to changes in healthcare processes and patient outcomes. ^(1/2)
Were all important outcomes considered?	Cannot tell due to the broad nature of how patient outcomes, patient safety and collaborative practice are described. ^(1/2)
Should policy or practice change as a result of the evidence contained in this review?	Review outcomes can only be described as promising with no outcome consistency. The review excludes qualitative studies. A broader view of robust research outcomes using a variety of methodological approaches may contribute to transferability of collective outcomes to policy and practice change. Total (6 ½)

Screening Question	An intervention to improve interprofessional collaboration and communications: A comparative qualitative study (Rice et al., 2010) (Links to patient safety found in abstract)
Qualitative Research	
Was there a clear statement of the aims of the research?	Yes – a broad aim however focused on improving communication and collaboration outcomes in a general adult medical unit. ⁽¹⁾
Is a qualitative methodology appropriate?	Yes - the focus is on subtleties of social interaction within interprofessional communication and collaborative(Kerfoot et al., 2006) interventions. ⁽¹⁾
Detailed Questions	
Was the research design appropriate to address the aims of the research?	Yes , using observation and interviews. However design influenced by senior stakeholders (external) who requested from the beginning that the research intervention be simple, non interruptive and brief. ^(1/2)
Was the recruitment strategy appropriate?	Uncertain , there were a large number of staff (250) that worked within four wards. Two wards were part of the intervention and two as control groups. This is a large group to inform an intervention. Note that control groups are a feature of quantitative research design. ^(1/2)
Were the data collected in a way that addressed the research issue?	Yes , well described using observation techniques plus formal and informal interviews. ⁽¹⁾
Has the relationship between researcher and participants been adequately considered?	Partial . Explicit statement of no conflict of interest. Other than that there is no overt acknowledgement of how the researchers may have accounted for observational influence on the results. ^(1/2)
Have ethical issues been taken into consideration?	Partial , via ethics approval and informed consent process. ^(1/2)

Was the data analysis sufficiently rigorous?	Yes - Data was independently analysed by the researchers before wider team input into emergent themes. Broad range of skills within the research team. ⁽¹⁾
Is there a clear statement of findings?	Yes – findings are described in detail using data examples to support findings and discussion. ⁽¹⁾
How valuable is the research?	There is resonance with the outcomes that are replicated in other research articles. However whilst the process of research was robust and described in detail, limitations around research design have affected the value of outcomes. This is because a less obvious research intervention did not gain traction in a diverse and large participant numbers across separate wards. Therefore, most valuable outcome is that a minimally intrusive research intervention centred on practice change is not likely to have sufficient influence within our in current health context. Total (7)

Screening Question	Clinical simulation in maternity (CSiM): interprofessional learning through simulation team training (Gum et al., 2010) (Links to patient safety found in abstract)
Was there a clear statement of the aims of the research?	Yes. Research was aimed to explore interprofessional simulation training to improve emergency care and team performance. ⁽¹⁾
Is a qualitative methodology appropriate?	Yes. The researchers were exploring participant perceptions. An inductive, data driven research design was appropriate. ⁽¹⁾
Detailed Questions	
Was the research design appropriate to address the aims of the research?	Yes, using participant interviews and semi structured interview schedule. Two participants declined interview however the reasons for this are not divulged. ⁽¹⁾
Was the recruitment strategy appropriate?	Yes. 21 participants were directly involved in a simulation exercise under study. ⁽¹⁾
Were the data collected in a way that addressed the research issue?	Partial. Interviews at 3-6 months explore sustainability however; this is not explicit in research aim. Data collection process is also outlined in analysis section. ^(1/2)
Has the relationship between researcher and participants been adequately considered?	Partial. Researcher was also workshop facilitator. This is explicit however; the potential for influence on the data is not explored in depth other than the researcher being known to the participants. There are no other competing interests. ^(1/2)
Have ethical issues been taken into consideration?	Yes. Research gained ethical approval via ethics committee at Flinders University. ^(1/2)
Was the data analysis sufficiently	Yes. Evidenced by anonymous scripts, manual coding by researchers plus use of computer software Nvivo 2.

rigorous?	Findings were returned to the participants for checking to achieve consensus. Researchers coded independently to support rigour and the principle of saturation was adopted. ⁽¹⁾
Is there a clear statement of findings?	Partial. Whilst three major themes and many sub themes are identified, only one theme is described in the paper. The remaining two themes are in a follow up paper so they can be discussed at length. ^(1/2)
How valuable is the research?	The value of this research paper is limited by the method of publication. Findings are fragmented which may disengage the reader and affects the completeness of discussion. Whilst the research design is appropriate to the aim, the authors state a qualitative approach as a limitation. Their own research bias is revealed in this view plus use of the word generalisability, which is a term more associated with a quantitative approach. The authors don't seek transferability or relevance of outcomes to other simulation contexts. Total (7)

Screening Question	Developing interprofessional communication skills (Wagner et al., 2011) (Links to patient safety in abstract)
Was there a clear statement of the aims of the research?	No. The aim of the pilot study is embedded in the aim of the article itself, which is to describe the development and implementation of a pilot simulation exercise to promote teamwork and collaboration between medical and nursing students. ⁽⁰⁾
Is a qualitative methodology appropriate?	Yes, because of the social nature of teamwork and collaboration. ⁽¹⁾
Detailed Questions	
Was the research design appropriate to address the aims of the research?	Uncertain. A pilot study appears to be a weak design to evaluate the outcomes of this simulation exercise. ^(1/2)
Was the recruitment strategy appropriate?	Yes, a voluntary process using equal number of simulation participants from both medicine and nursing. ⁽¹⁾
Were the data collected in a way that addressed the research issue?	Uncertain. Participant data was from feedback discussion which was not recorded or transcribed. A formal evaluation tool was used however only nursing student feedback was stated in the article. Responses were displayed as averages with a standard deviation which is usually associated with quantitative research. Of note the average responses were between 4.4 and 4.8 which is low out of 20 participants. ^(1/2)
Has the relationship between researcher and participants been adequately considered?	Not stated. ⁽⁰⁾

Have ethical issues been taken into consideration?	Not stated. Ethical considerations implied through voluntary participation in pilot study. ⁽⁰⁾
Was the data analysis sufficiently rigorous?	No. This is demonstrated by a lack of data from the medical participants and the use of feedback which appears to have taken participants responses at face value. There is no explanation as to why there is no medical student formal evaluation included. ⁽⁰⁾
Is there a clear statement of findings?	Partial. The article states that the pilot simulation was an effective and well-received educational intervention for nursing students. The omission of medical student participant responses or any reason for this casts doubt as to how this pilot study has achieved this aim. ^(1/2)
How valuable is the research?	The study design appears adhoc. Furthermore, omission of 50% of the participant group in the outcomes challenges the credibility of the pilot study outcomes. Overall this article does not contribute to knowledge about the value or otherwise of interprofessional education simulations. Total (3½)

Screening Question	Improving patient safety by using interprofessional simulation training in health professional education (Kyrkjebø & Hage, 2005)
Was there a clear statement of the aims of the research?	Yes. There is a clear purpose however, a broad statement to test a simulation program through evaluation of design and student's experiences. ⁽¹⁾
Is a qualitative methodology appropriate?	Not explicit however methodology appropriate as the aim was to evaluate student's experiences. Other terms consistent with this methodology include seeking the "essence" and "information rich". ^(1/2)
Detailed Questions	
Was the research design appropriate to address the aims of the research?	Yes. Participants were part of an interprofessional simulation exercise. Authors described the simulation design and how the students progressed through it. At times however, the description seemed overly complicated. ^(1/2)
Was the recruitment strategy appropriate?	Yes – self selected student participants. Informed consent was gained verbally. Some imbalance with 8 nursing students and 4 medical however this combination does meet the definition of interprofessional, i.e. two or more. ⁽¹⁾
Were the data collected in a way that addressed the research issue?	Yes. Focus group was consistent with the methodology. Groups were conducted using a structured interview guide that was provided in the article. Interviews were taped and coded. This process is summarised in some detail. ⁽¹⁾
Has the relationship between researcher and participants been adequately considered?	Not stated ⁽⁰⁾
Have ethical issues been taken into consideration?	Insufficient. Other than the informed consent process, obtaining ethical approval not stated. ^(1/2)
Was the data analysis sufficiently	Partial. There is a useful limitations section. Authors name selection bias as a risk of participant self selection and

rigorous?	also note participant influence in a focus group context. Data analysis appears to be rigorous with two independent author analysis repeated by all three authors in a triangulation approach. There is limited presentation of the data to ascertain the quality of this data analysis process. ^(1/2)
Is there a clear statement of findings?	Yes. Authors suggest that student involvement in simulation training is valuable to enhance learning process, reflections and interprofessional working to support patient safety. ⁽¹⁾
How valuable is the research?	Reasonably. The value of simulation training outcomes appears consistent with other studies. This article identifies that the timing of undergraduate interprofessional training is important. This is due to professional socialisation that develop over time and was evident in the findings. The authors have built on these results with other interprofessional simulation training initiatives, which demonstrate a confidence in their own study results. Total (6)

Screening Question	Medical students benefit from learning about patient safety in an interprofessional team (Anderson et al., 2009)
Was there a clear statement of the aims of the research?	No. The research aim embedded within a paragraph and hard to find. The aim is important as the study wishes to investigate whether patient safety is enhanced when learning interprofessionally . ⁽¹⁾
Is a qualitative methodology appropriate?	Partial. A multi method evaluation was used via questionnaires and focus groups. There was no explanation as to why this methodology was selected or how the methods would reveal the desired experiences. ^(1/2)
Detailed Questions	
Was the research design appropriate to address the aims of the research?	Partially. Question relevance of questionnaires as the questions are about perceptions, hopes, expectation which were captured in focus groups. Research design was described however lacked rationale that supported design. The design reads as if it is a single IPE intervention however later reading reveals that the design considers nine events over 2 years. There is no explanation for this length of time for the study and the contribution to outcomes. ^(1/2)
Was the recruitment strategy appropriate?	Not stated. The authors state that many participants came to the intervention “disgruntled” which suggests a compulsory aspect. Disgruntlement was related to perceived loss of clinical time for the medical students. ⁽⁰⁾
Were the data collected in a way that addressed the research issue?	Partial. Description of data form and collection however not in depth, e.g. focus groups took place however, there is no explanation about structure. No discussion of saturation. ^(1/2)
Has the relationship between researcher and participants been adequately considered?	Not explicit. The authors declare that there was no conflict of interest. ^(1/2)
Have ethical issues been taken into consideration?	Partially. Ethical approval obtained. No explanation as to how participants were recruited or informed consent obtained. ^(1/2)

Was the data analysis sufficiently rigorous?	Partial. Steps of thematic analysis not evident. There is no acknowledgment of study limitations. Questionnaires appear to be more rigorously analysed using software however there is scant discussion on the significance or otherwise of the results. ^(1/2)
Is there a clear statement of findings?	Yes. That interprofessional learning enhanced awareness of team factors. However, enhanced learning about patient safety occurred regardless of whether it was in a uni or interprofessional context. ^(1/2)
How valuable is the research	Question contribution of questionnaires to data however acknowledge that a quantitative aspect to the research is important to raise the credibility of outcomes within medical profession. Overall, reporting of the study was “light”, i.e. a descriptive summary rather than a more detailed and critical research article. Reinforces recommendation for teamwork however this is from the literature rather than the research study. Total (4 1/2)

Screening Question	Patient safety investigations: the need for interprofessional learning (Wakefield et al., 2009)
Was there a clear statement of the aims of the research?	Yes. To explore the efficacy of a 3-day root cause blended (interprofessional) learning programme. ⁽¹⁾
Is a qualitative methodology appropriate?	Yes. The researcher wishes to know more about knowledge and behaviour changes that may result from the learning programme. ⁽¹⁾
Detailed Questions	
Was the research design appropriate to address the aims of the research?	Yes. Detailed explanation provided of methodology. ⁽¹⁾
Was the recruitment strategy appropriate?	Yes. Via participant information sheets and informed consent forms prior to programme. ^(1/2)
Were the data collected in a way that addressed the research issue?	Yes. Via focus groups and individual interview. Structured questions were piloted to test relevancy of data generated. Consensus of data acknowledged via focus group discussion process. However, risk of bias that could occur from piloting and 'group consensus' not noted. ^(1/2)
Has the relationship between researcher and participants been adequately considered?	Not stated. ⁽⁰⁾
Have ethical issues been taken into consideration?	Yes. Ability to withdrawal from the study was acknowledged plus a process of reporting explained should patient safety issues arise. ^(1/2)
Was the data analysis sufficiently	Yes. Process of data analysis described with reference to Polit and Beck. Inter-researcher consistency was checked

rigorous?	with a third author. Five main themes revealed were clearly presented. ⁽¹⁾
Is there a clear statement of findings?	Yes. Findings are grouped into themes supported by data examples. Authors state that interprofessional education has much to offer health professionals in regards to patient safety related incidents however, it is less clear whether this is related to the process of root cause analysis or interprofessional working per see. ^(1/2)
How valuable is the research?	Partial. Authors relate outcomes to literature on topic, e.g. explicit interprofessional model of education, revolutionary vs evolutionary change and how to reveal patient safety outcomes. Therefore, the value of this research is in its consistency with other literature, however this point is not explicitly made. Total (6)

Screening Question	Perceptions of effective and ineffective nurse-physician communication in hospitals (F. P. Robinson et al., 2010) (Linkages to interprofessional collaboration and patient safety in abstract)
Was there a clear statement of the aims of the research?	Yes. To explore nurse and physician perceptions of effective and ineffective communication between the two professions. ⁽¹⁾
Is a qualitative methodology appropriate?	Yes. The researchers seek data about participant feelings, opinions, perceptions and experiences. ⁽¹⁾
Detailed Questions	
Was the research design appropriate to address the aims of the research?	Yes. The researchers explain that they seek to gather data about participant feelings, opinions, perceptions and experiences. ⁽¹⁾
Was the recruitment strategy appropriate?	Yes. Rational for participant selection was provided and recruitment process explained in detail. Participant characteristics were clearly presented. ⁽¹⁾
Were the data collected in a way that addressed the research issue?	Yes. Focus group guide and structure is clear to the reader making explicit the specific nature of enquiry. Groups were audio taped and transcribed. ⁽¹⁾
Has the relationship between researcher and participants been adequately considered?	Indirectly. Facilitators were made up of two nurses and one physician who were part of the university faculty. This detail is not explored further by way of relationship or influence. ^(1/2)
Have ethical issues been taken into consideration?	No. Process of ethics approval, informed consent process or any ethical aspects to study not stated. ⁽⁰⁾
Was the data analysis sufficiently	Yes. Limitations of the study were described and included sample size and participant bias. Method of data analysis

rigorous?	was described plus criteria for a theme to be included. These themes were explicit however; the themes that did not meet the inclusion criteria could have been included for completeness. ⁽¹⁾
Is there a clear statement of findings?	Yes. Findings are supported by specific data examples and organised according to themes. Discussion refers back to study aim however findings related to themes already identified in previous literature. ^(1/2)
How Valuable is the research?	The value in this research is how the outcomes relate to evidence already on the topic. Therefore, the authors acknowledge that transferability within their individual study is limited however; there is strong relevance to the outcomes being transferred when compared to existing literature. Total (7)

Screening Question		“What is found there”: Qualitative analysis of physician–nurse collaboration stories (McGrail et al., 2009) (Links to patient safety and collaborative practice found in abstract)
Was there a clear statement of the aims of the research?	Yes.	To analyse and describe the experience of nurses and physicians analysis of collaborative narratives. ⁽¹⁾
Is a qualitative methodology appropriate?	Yes.	The authors seek to understand participant’s experiences of collaboration. ⁽¹⁾
Detailed Questions		
Was the research design appropriate to address the aims of the research?	Yes.	A workshop whereby participants wrote narratives about their experiences of collaborative practice. The authors justify their choice of narrative inquiry by stating that participatory inquiry focuses on what is working, effective and good in an organisation. This approach is consistent with the study’s aims. ⁽¹⁾
Was the recruitment strategy appropriate?	Not stated.	The participant demographics are displayed however the strategy for recruitment is not explained. ^(1/2)
Were the data collected in a way that addressed the research issue?	Yes.	Data collection was via participant narratives consistent with the aim and study design. ⁽¹⁾
Has the relationship between researcher and participants been adequately considered?	Not really.	Researcher relationship has only been described in context of the data analysis, not specifically with participants. Another aspect is any gender bias resulting from all female researchers. ^(1/2)
Have ethical issues been taken into consideration?	Partial.	Only informed consent from the participants was evident. ^(1/2)

Was the data analysis sufficiently rigorous?	Yes. Analysis was via an inductive approach to achieve consensus. Explanation of data analysis is very thorough and encompasses specific categories used, research cross checking and moderation. Themes were returned to the participants for member checking. The process to achieve saturation and consensus appeared robust. ⁽¹⁾
Is there a clear statement of findings?	Yes. Findings are supported by specific text examples followed by a clear discussion element. The outcomes relate to collaboration in two principle domains of relational and clinical. ⁽¹⁾
How valuable is the research?	Supports learning of collaborative competencies as an areas focus. Due to small sample size, the authors don't support transferability of results however this is contradictory as the study outcomes appear consistent with other cited literature therefore the issue of transferability can be broader than this individual study. Total (7)

Screening Question	The role of nurses in interprofessional health and social care teams (Miers & Pollard, 2009) (links to “danger to patients” found in introduction)
Was there a clear statement of the aims of the research?	Yes , however the objectives of the study are broad. These include collaborative attributes, nature and effective collaboration in their practice setting and knowledge of other professional roles. ^(1/2)
Is a qualitative methodology appropriate?	Yes , the study wished to know more about participant’s views on the objectives. ⁽¹⁾
Detailed Questions	
Was the research design appropriate to address the aims of the research?	Yes , Participant views was obtained using face to face and telephone interviews. ⁽¹⁾
Was the recruitment strategy appropriate?	Not explained. Participants were chosen from health professionals who had participated in interprofessional undergraduate education. The method of recruitment for this study was not explained. ⁽⁰⁾
Were the data collected in a way that addressed the research issue?	Yes. Data collected via interview. Transcripts were returned to the participants for verification. ⁽¹⁾
Has the relationship between researcher and participants been adequately considered?	No. There is no reference to any relationship between the researchers and participants. ⁽⁰⁾
Have ethical issues been taken into consideration?	Yes. The study gained ethics approval from three ethical committees however the significance or reason for this is not explained! ^(1/2)
Was the data analysis sufficiently	Partial. The process of data analysis was through thematic analysis. Nvivo 7 was the software package used to

rigorous?	analyse the data however no further explanation of the process of analysis is offered. ^(1/2)
Is there a clear statement of findings?	Yes. Findings are provided however, they are loosely returned to the research objectives. There is adequate description of findings however little critical analysis has been applied to these findings and there are no clear recommendations for practice. ^(1/2)
How valuable is the research?	Limited. The study excludes medical staff but there is no explanation for this decision. The lack of critical analysis of the findings limits the research to interest value only. There are no clear recommendations for practice other than suggesting that nurse managers have a role to play to address gaps in nurses collaborative competencies. This recommendation is random given that the focus of the article includes physiotherapists, occupational therapists, social workers and midwives! Total (5)

Screening Question	Interprofessional collaboration amongst junior doctors and nurses in the hospital setting. (Weller, Barrow & Gasquoine, 2011) (Links to patient safety are found in the introduction).
Was there a clear statement of the aims of the research?	Yes. Aim is understand interactions affecting junior doctors and nurses to inform interventions that will promote interprofessional collaboration. ⁽¹⁾
Is a qualitative methodology appropriate?	Yes. The study seeks to understand the nature of interactions activities and issues in health care teams. ⁽¹⁾
Detailed Questions	
Was the research design appropriate to address the aims of the research?	Yes. Data was obtained via structured participant interviews. However the researchers have not explained rational for their research design. For example, the thematic coding framework was an existing one from the team work literature however limited explanation is given as to why this approach is chosen. ^(1/2)
Was the recruitment strategy appropriate?	Yes. Recruitment strategy explained. Selection criteria based on participant availability and those in 2 nd year of practice. ⁽¹⁾
Were the data collected in a way that addressed the research issue?	Yes. Process of structured interviews explained in detail with the aim of process consistency and transparency. Interview questions were described although the choice of interviews over other methods is not explained. ^(1/2)
Has the relationship between researcher and participants been adequately considered?	In part. It is clear that the researchers also conducted the interviews however, no attention has been given to any bias that may have resulted. ^(1/2)
Have ethical issues been taken into consideration?	Partial. Process of gaining ethics approval provided however, no details provided about participant consent. ^(1/2)
Was the data analysis sufficiently	Yes. Use of NVivo 8. It is explicit which researchers conducted the analysis and the process of this is described.

rigorous?	There is detailed explanation as to how this process is moderated with member checks by co-researchers. The principle of saturation was applied to the number of interviews that were conducted. ⁽¹⁾
Is there a clear statement of findings?	Yes. Findings are clearly reported against the explicit coding framework. The researchers are clear that the findings are reported as uninterpreted. ⁽¹⁾
How valuable is the research?	The research reassures that medical and nursing staff are fundamentally well equipped to work collaboratively. It is the context of care and leadership structures that are of significant influence. The article makes recommendations aligned with the thematic framework however these recommendations focus on IP learning and context. There is no attempt to explore fundamental systems or models of care. Total (7)

Screening Question	Improving teamwork, trust and safety: An ethnographic study of an interprofessional initiative (Jones & Jones 2011). (Links to patient safety in title and introduction)
Was there a clear statement of the aims of the research?	Yes. The aims were to explore the development of team working practices and to explore participant perceptions of how team working initiatives affected them. ⁽¹⁾
Is a qualitative methodology appropriate?	Yes. The article places value on how qualitative research can contribute to the complexities of interpersonal relationships. The research wished to understand more about participant perceptions. ⁽¹⁾
Detailed Questions	
Was the research design appropriate to address the aims of the research?	Yes. Informed by an ethnographic methodology using observation, semi structured interviews, staff workshops and hospital data such as admission and discharge information. Used a broad range of data sampling methods. ⁽¹⁾
Was the recruitment strategy appropriate?	Yes. Accessed participants from the initiative on voluntary basis although process of consent not discussed. Researchers used purpose sampling which was an appropriate strategy to ensure ability to compare pre and post. ^(1/2)
Were the data collected in a way that addressed the research issue?	Yes. Detail of interview structure explained. Using a broad sampling method ensures depth of responses however the data collection being limited by time and funding rather than saturation is limitation of rigour. ^(1/2)
Has the relationship between researcher and participants been adequately considered?	Yes. One researcher is an employee and the other with interest in health care delivery research. The resultant bias is acknowledged and strategies explained to counter and minimise the impact of bias on the data. ⁽¹⁾
Have ethical issues been taken into consideration?	Partial. Obtaining ethics approval is stated. The intent to make the data anonymous is explicit. ^(1/2)

Was the data analysis sufficiently rigorous?	Yes. Thematic and content analysis in an inductive manner. Steps of data analysis are explicit and include individual author analysis and a project support group. The process of data reduction and re-ordering appears robust. ⁽¹⁾
Is there a clear statement of findings?	Yes. A clear summary of the findings according to emergent themes however, there is little discussion or analysis and the article moves to summarise and conclude. ^(1/2)
How valuable is the research?	Partial. This article is one of the few who attempted to focus on patient safety incidents however makes no meaningful attempt to analyse their findings. Regarding the research aims, the authors wished to contribute to what is already reported in the literature however, there is minimal analysis of the contribution made by their findings to the debate. Despite common ground found in the literature, the authors are not confident to back the transferability of their findings. This lack of confidence impacts on the articles trustworthiness. Total (7)

Screening Question	Role understanding and effective communication as core competencies for collaborative practice. (Suter, et.al., 2009). (Links to positive patient outcomes found in abstract).
Was there a clear statement of the aims of the research?	Partial. There is a clear aim however is embedded in the introduction therefore less accessible to the reader. Research aim is to understand IP competencies considered most relevant by front line clinical staff. ^(1/2)
Is a qualitative methodology appropriate?	Partial. Qualitative approach to research is loosely appropriate given the authors wish to “understand”, however no further explanation for research methodology selected is offered. ^(1/2)
Detailed Questions	
Was the research design appropriate to address the aims of the research?	Assumed. The research is qualitative and the design is to obtain data via individual and group interviews using a semi structured interview process however no further rationale is provided. The study is broad across seven health care sites so a higher likelihood for representative findings is promising! ^(1/2)
Was the recruitment strategy appropriate?	Not explained. There are 60 participants. There is no analysis of the professional demographic spread which is heavily weighted to nursing (43%) and allied health (48%) compared to physician participants (1%). ⁽⁰⁾
Were the data collected in a way that addressed the research issue?	Assumed. This issue is not addressed in the article other than what is evident in the research design. There is no detail about the process of the interviews other than that they occurred! ⁽⁰⁾
Has the relationship between researcher and participants been adequately considered?	Partial. The authors state that there is no conflict of interest however there is no discussion of any relationship factors between the authors and participants that may impact on the research. ^(1/2)
Have ethical issues been taken into consideration?	Partial. Evidence of ethical approval being obtained. This is in contrast to the lack of any other ethical processes that may be present, e.g. no acknowledgement of participant consent process. ^(1/2)
Was the data analysis sufficiently	Partial. Inductive analysis of transcripts using computer software and researcher cross checking. Explained use of

rigorous?	codes and memo tracking as process however no principles described, e.g. data saturation or participant checks. ^(1/2)
Is there a clear statement of findings?	Yes. Extensive findings and discussion section. Two clear competencies that are valued by staff. These are returned to the literature which is useful as a check of trustworthiness for the reader. ⁽¹⁾
How valuable is the research?	Potentially valuable as revealing dominant competencies by front line staff adds realism and practicality to the broad issue of IP competences. Despite methodological deficiencies the authors are confident in their findings and how this should contribute to an IP competency framework. Some attempt is made to link these with patient safety and outcomes however this is tenuous. More attention to the research process in detail would have strengthened this article adding to credibility which, currently, is weak. Total (4)

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