DO INTEGRATED CARE PATHWAYS IMPROVE PATIENT OUTCOMES?

by

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PhD thesis abstract

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The purpose of the study was to determine if the use of an Integrated Care Pathway (ICP) was associated with more positive outcomes than traditional methods of care. The effectiveness of the ICP had not previously been tested (in relation to traditional methods of care) to determine if it made any difference, at a patient, staff or system (healthcare organisation) level.

In February 2001 (as part of the NHS modernisation agenda) the gynaecology services within one UK city were re-organised and two separate units were merged into one new larger unit. Prior to the re-organisation, the two units offered similar treatments and were managed collectively; however, one site had developed and implemented ICPs and the other site had continued to use traditional methods of care delivery.

ICPs are multidisciplinary plans for organising and delivering patient care. The plan of care is outlined in a sequential manner including all interventions with expected patient outcomes. The literature suggests that ICPs result in improved patient outcomes and lower hospital costs by decreasing length of stay and improving observations i.e. detecting signs of infection in a timelier manner. ICPs are recognised to facilitate the multidisciplinary partnerships in planning of patient care. However the literature was primarily anecdotal or non generalisable, and therefore additional local research was deemed essential.

To ensure the research problem could be answered, three specific research questions were developed for testing: (1) What effect does an

ICP have on the outcomes of gynaecological patients attending for major abdominal surgery? (2) What factors, including the use of an ICP contribute to the variance in length of stay for gynaecological patients? (3) What are the opinions of the staff who have used the ICP, of the ICP itself? Relevant directional hypothesis were derived from each research question.

A quasi-experimental design was used to answer the first research question. Subjects were attached to one of two groups, a treatment group, which used the ICP, and a comparison group, which continued to deliver care based on traditional methods. Descriptive correlation was used to answer research question two and for the third research question descriptive exploration was used. Variables of interest from a patient, staff and system (health care organisational) level were collected to determine the effectiveness of the ICP compared with traditional methods.

One of the difficulties faced with ICP research is the number of variables that can potentially influence patient care. Holzemer's model (1994, based on the work of Donabedian, 1966) was used to conceptualise the variables (and therefore the data collection instruments) into the category of structure, process or outcome at either a patient, provider or systems (health care organisation) level. This in turn helped to theorise the linkage between the variables within this study, identifying conceptual and functional relationships.

The abdominal surgery ICP supported improvements in cost and efficiency through a reduction in length of stay (treatment site = 5.29 days, comparison site = 6.16 days) and a positive return to patients' perception of health. However, there was a reduction in patient satisfaction with nursing care with the introduction of the ICP and this needs further study. Involving patients in future developments and evaluations could promote long-term patient satisfaction.

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1. Chapter one: Introduction

1.1. Introduction

The purpose of this research was to determine the influence of integrated care pathways (ICPs) on patient outcomes. There was a local need to consider whether ICPs should be implemented or traditional methods of care planning and delivery should continue. With no strong evidence available to support this decision there was a need to empirically study ICPs within the area of interest. Literature, polices and publications prior to data collection are reported in this chapter and the literature review. This chapter offers an overview of the concept of ICPs and their emergence within the United Kingdom (UK) health care system. The various terms surrounding ICPs are summarised to provide a clear understanding of the concept. The key drivers for the National Health Service (NHS) are explored enabling the reader to appreciate the challenges and priorities of the time. These included delivering evidence-based practice, high quality, and individualised patient centred care within limited resources. The influences on the study as well as an overview of the development of a local ICP are described followed by an outline of the research problem. Finally, a description of the subsequent chapters of the thesis is provided.

1.2. Background

To comprehend fully the development and use of ICPs, it is first necessary to understand the concept of managed care. Managed care originated in North America in the 1970s (Luther and Crofts, 1997) but the health care system did not use the concept until the 1980s (Ellwood and Lundberg, 1996). Managed care is a mechanism through which episodes of care (procedures, treatments and operations) can be fixed with a predetermined cost (Zander, 1988). In the past, there were limited or non-existent financial incentives to examine ways to improve resource utilisation within the UK's health care setting. Additionally, clinical staff did not want care to become standardised as they believed it would restrict professional autonomy (Coffey et al., 1992). In the USA, health care costs continued to rise, and by the early 1980s costs were growing at a rate of 19% a year, which led to pressures on total health care spending. A solution was needed to contain the rising costs. Technological advances also influenced cost pressures as new drugs, diagnostic and therapeutic equipment became readily available (West, 1998). In 1982, the USA federal government restructured the delivery of health care in an attempt to contain the increasing costs. A prospective payment system based on Diagnostic Related Groups (DRGs) was introduced. DRGs represent all possible known diseases, with the assumption that every hospital stay will fall into a DRG category. The hospital is reimbursed a flat fee for the DRG group rather than for the actual service a patient receives (Chitty, 1993). If the patient costs are more than the capital figure (e.g. by staying in hospital extra days or by requiring additional tests) the hospital is liable to pay the difference; however, if the patient is discharged early, thereby reducing the cost, the hospital collects the profit. Prospective payment was designed to create a more competitive environment and resulted in an emphasis on efficiency, cost effectiveness and financial accountability. The introduction of managed care within the USA health care system was born with the emphasis on controlling cost and increasing access to health care (Dalen, 1996).

Case management is a term commonly associated with managed care. The concept of case management emerged in 1985 at the New England Medical Centre Hospitals in Boston, USA. Pioneering work headed by Karen Zander called 'The Pratt 4 Project' examined how the care provided on a surgical unit could be improved while using the same or reduced resources (Zander, 1992). Case management is defined by the Joint Commission on Accreditation of Health care Organization (JCAHO) as a clinical system that focuses on the accountability of all health professionals responsible for the co-ordination, continuity and delivery of health care services. Case management is a practice model that uses a systematic approach to identify specific patients and to manage patient care to ensure optimum outcomes (Ignatavicius & Hausman, 1995). Furthermore, Bower (1994) identifies case management goals as proving well co-ordinated care, satisfactory outcomes, appropriate lengths of stay, appropriate resource utilisation and integrated multidisciplinary patient care. Integrated care pathways are one aspect of managed care and the case management process.

1.3. Integrated Care Pathways (ICPs) – terminology and definition

There are many variations to the term integrated care pathway, and they are known by up to 30 different names in the UK alone. Table 1 lists some of the names used to describe ICPs.

Table 1: Examples of names used for ICPs

Anticipated recovery path
Care map/ path/ pathway
Case management
Clinical path/ pathway
Clinical recovery path/ pathway
Collaborative case management plans
Collaborative care plan/ path
Critical path/ pathway
Expected recovery path/ pathway
Integrated care plan/ path/ pathway
Integrated clinical path/ pathway
Multidisciplinary care pathway/ plan
Multidisciplinary record
Recovery paths/ pathway

A variety of definitions for an ICP are now available in the literature. Within these definitions are some common elements, but there also are some differences too. For the purpose of this study 'Integrated Care Pathway' (ICP) will be used as a generic term throughout this thesis. An ICP is defined as providing an outline of inpatient care, in a sequential manner, including all interventions and expected patient outcomes, within a given time period for a group of patients for a discrete episode with a similar problem e.g. hysterectomy, hip replacement. ICP establishes a standard of care based on an ideal patient administrated by a team of co-ordinated health care professionals. The ICP serves as a guide for the management of the ideal patient and replaces the traditional multidisciplinary documents for planning, delivering and evaluating patient care. It is not to be confused with the wider patient journey pathway from initial assessment in primary care to interventions in secondary care.

An integrated care pathway has been described as:

> 'A multidisciplinary process of patient focused care which specifies key events, test and assessments, occurring in a timely fashion to produce the best prescribed outcomes, within the resources and activities available, for an appropriate episode of care'.
>
> Wilson J. 1997, p21.

In just a decade, the health care literature has grown with articles describing numerous possible types of ICP. There was general concern, however, that the primary motivating force for the introduction of ICPs in the UK was to reduce the costs of health care, due to similar problems faced by the USA, and that the emphasis of care may evolve from quality to cost outcomes (Currie and Harvey, 1999).

The move towards managed care in the UK was linked to the restructuring of the NHS (Oakley and Greaves, 1995). The 1990 NHS Act introduced the concept of the internal market to the NHS. One of the main objectives of the internal market was to introduce competition between different hospitals that would, in turn, offer patients both the appropriate quality and choice of services. It was also to ensure that successful hospitals flourished (Department of Health, 1989). West (1998) argues that there were several managed care elements already in place in the UK under other names. Examples include limited cash, medical staff being given no incentive to over or under-treat patients, the purchaser-provider split; General Practitioners (GPs) acting as broad managers, indicative drug budgets, protocols and guidelines, prescription monitoring and formularies. At the simplest level the whole of the NHS is a kind of managed care organisation in the sense that total spending on hospitals and community care is managed through an environment of limited financial resources (West, 1998). In the UK, purchasers can be viewed as consumers through their GP, offering a choice of services for different procedures, treatments and operations. Although this is not identical to the choice of USA citizens, some parallels can be drawn.

Since the introduction of the internal market in the NHS, radical changes that mirror the USA's drive for cost efficiency have taken place (Newman, 1995). Quality improvement initiatives, rising numbers of older people, the movement from acute care setting to home care, shrinking financial resources have all contributed to changes in health care delivery (Beyea, 1996). Therefore, the principle impetus of managed care in the UK focused on the delivery of quality patient care with financial rewards taking second place (West, 1998). In the UK, ICPs began to emerge piecemeal in the mid 1990's, but the real impetus for their development came with the publication of the white paper, *The New NHS: Modern~Dependable* (Department of Health, 1997). Although the paper did not specifically refer to ICPs there are strikingly similar sentiments i.e. national standards, local flexibility, efficiency, quality and patient centeredness.

1.4. Significance to patients, providers and health care systems

1.4.1. Patients

The effects of ICPs on patient outcomes, specifically within the UK, are of significant importance as they help inform the debate around the influence ICPs have on quality aspects of care. To date, there is minimal empirical research on the effects ICPs have on patient outcomes, with most of the literature being anecdotal and drawing on personal opinion and experience. Therefore it remains necessary to question the effect ICPs have on patient outcomes before they are employed as a mechanism to improve the quality of patient care. Interestingly, informed consent is seen as a quality improvement initiative, and Tingle (1997a) argues that ICPs can lead to an improvement in this area as patients can understand what is happening to them throughout their stay, due to the journey being made explicit and integrating multidisciplinary care providers. However, it is unclear how the claims by Tingle are reached due to the lack of clinical data surrounding this conclusion.

1.4.1.1. Individualised patient care

Individualised patient care is seen by many as a quality improvement initiative and has gained significant momentum in the UK. In the UK the ideology of individualised patient care arose in the early 1970's (Salvage, 1992). This ideology was encapsulated within the nursing process; an approach to care that focused the inter-related stages of assessment, planning, implementation and evaluation of care (McFarlane and Castledine, 1982). Subsequent initiatives to maintain individualised patient care included the introduction of nursing models and primary nursing. Nursing models represented concepts that describe the nursing care activity and guide practice. Primary nursing is a type of patient care assignment that involves an identified nurse assuming overall responsibility (named nurse) for all aspects of an individual patient's needs (Department of Health, 1991, 1993a). Unfortunately both nursing models and primary nursing failed to address the power relationship within the multidisciplinary team and between clinical staff and managers. For nursing models and primary nursing to be successful it required the named nurse to make informed decisions to support the patients' progression e.g. changes in care specifics i.e. time of ambulation, re-commencing of fluids and diet. The decisions often required the named nurse to have the power to instigate and carry out the specific changes in care. However, the rest of the multidisciplinary team (including managers) had not relinquished their power. This resulted in the named nurse being unable to act independently and therefore no differences in clinical practice were seen. In 1999 the National Strategy for Nursing, Midwifery and Health Visiting, *Making a Difference* (Department of Health, 1999) re-emphasised the importance of providing a high quality service that met the needs of the individual patient. The challenge was to find a mechanism to deliver high quality individualised patient centred care in everyday clinical practice. ICPs met this challenge by providing a model to support the growing demand for individualised patient care by encouraging true collaborative working across the multidisciplinary team with the patient being placed at the centre, and by explicitly stating what was required for managers to determine accurate costs. Zander (1988) has demonstrated that ICPs have provided a means for making collaborative care a reality following evaluation of the introduction of an ICP in Boston, USA, and this will be expanded upon in the next chapter. Antrobus & Brown (1996) reinforce this by stating that by developing and using guidelines nurses can strengthen their position and positively influence patient care and this can be achieved through the use of ICPs.

1.4.2. Providers

There are different views in the literature and among the multidisciplinary professions about ICPs; how they should be used, if they should even be developed and how they should be implemented. Some senior medical staff have resisted implementation of ICPs because they think they are an example of 'cookbook' medicine that will affect clinical judgement (Tingle, 1997b). There is a need however, to find a mechanism that supports the delivery of high quality patient care within the restraints and pressures of the NHS. Ignatavicius and Hausman (1995) state that nearly all hospitals that have purchased case management models have shown a decrease in length of stay and significant cost savings. In addition, patient and staff satisfaction have improved in many settings and there are suggestions of improved quality, communications and decreased staff absenteeism (Zander, 1988). These findings are explored in detail in chapter two.

In the UK, the traditional method of care delivery is provided through a vertical system, with multidisciplinary groups determining their own plan of care, often resulting in poorly co-ordinated care and duplication of effort. The patient has little or no control over the planned activities and collaboration is generally seen as a spontaneous or accidental occurrence rather than a fair expectation of practice. Multidisciplinary collaboration can further be hampered through having poor written communication including separate patient records (documentation). Wilson (1994) acknowledges that, when documentation is fragmented, the multidisciplinary team experience decreased communication regarding patient care and unnecessary duplication of results. Additionally, the amount of documentation required to be completed by the variety of disciplines has risen significantly over the past decade, due to the rise in litigation claims and with the associated need for accurate and full records and the increased complexities of treatments and patients' responses (Johnson, 1997). The issue is further complicated by the proposed move away from documentation in a paper-based system to documentation with a computerised system (Department of Health, 1998). Tingle (1997b) argues that ICPs improve the quality of documentation and can support practitioners legally as they can show that their decisions were based on recommended guidelines. Tingle (1997b) cites instances of case law to support his argument including Airedale Trust versus Bland (1993) and Early versus Newham Health Authority (1994).

1.4.3. Health care systems

1.4.3.1. Clinical governance

Further restructuring of the NHS (Department of Health, 1997) introduced the concept of clinical governance, a mechanism of capturing all the fundamental elements (research, audit, effectiveness, patient choice, lifelong learning, and risk management) that ensured a high quality service within a constrained financial environment. The NHS Executive (Department of Health, 1998) stated that clinical governance is a system through which NHS organisations are accountable for continuously improving the quality of their services and safeguarding high standards of care by creating an environment in which excellence can flourish. Clinical governance attempted to place quality at the heart of the NHS political agenda and on an equal footing with financial pressures by making chief executives equally responsible for financial balance and clinical quality (Department of Health, 1997; Department of Health, 1998). For the first time, health care organisations had to demonstrate clinical quality outcomes as well as financial balance.

1.4.3.2. Clinical effectiveness

Clinical effectiveness is a mechanism of putting the philosophy of clinical governance into clinical practice. *The New NHS* (Department of Health, 1997) white paper re-emphasised the importance of providing a high quality health service. An essential element of ensuring high quality health care was about improving effectiveness of clinical care and providers were charged with the responsibility of developing local strategies to promote clinical effectiveness (Department of Health, 1996). The Department of Health had started to devolve power from central government to local communities. One of the first areas where power was decentralised was through the invention of local Trusts in 1991 which replaced traditional hospitals. The intention was that local Trusts would have more control over their own affairs, from both a quality and cost effectiveness view point. Strategies to support quality needed to be cost effective and lead to improved patient outcomes. They also needed to facilitate evidence-based practice, reduce risk and allow continuous monitoring. The application of national and local clinical guidelines is one such effort to improve clinical effectiveness and therefore support evidence based practice (Department of Health, 1993b). Clinical guidelines, protocols and ICPs provide a key vehicle for promoting evidence based practice and a basis for systematic audit (Tingle, 1997b). The NHS had embarked on an era where evidence based clinical decisions were increasingly being used to justify treatment decisions.

1.4.3.3. Evidence based practice

The use and comprehension of the term 'evidence based practice' in relation to nursing shows remarkable variation. The literature houses numerous definitions with some tending to be closely related to the concept of 'evidence based medicine' (Banning, 2005; Sackett and Rosenburg, 1996). Evidence-based practice is defined as

> 'Conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients'
>
> p. 620, Sackett and Rosenburg (1996)

Evidence based practice (EBP) is viewed as a synthesis of individual clinical expertise with the best available scientific evidence. Clinical expertise is defined as the skill and judgement resulting from clinical experience and clinical practice, and best scientific evidence is viewed as clinically relevant research (Sackett, 1997). Although much of the early development of the evidence based concept was medically dominated and heavily influenced by the bio-medical agenda (Green and Tones 1999), more recently, the term EBP is used to reflect the multidisciplinary nature of health care practice. The use of evidence is continually reiterated in practice by the use of patient management plans, patient group directions, protocols, guidelines and patient centred care planning (Banning, 2005).

The starting point for EBP is evidence, and it is important to define what is meant by sound evidence. The hierarchy of evidence was introduced which is widely understood to be the authoritative definition for sound evidence. There have been numerous adaptations of the hierarchy of evidence but all follow a graded approach to the levels of evidence which tend to start with anecdotal accounts and rise to meta-analysis of randomised controlled trials (Clarke, 1998; Clarke et al., 1998; Olkin, 1995). The hierarchy is outlined in Table 2 taken from Therapeutic Goods Administration (October 2001).

Table 2: The hierarchy of evidence

Level of Evidence	**Type of Evidence**
High	Evidence obtained from a systematic review of all relevant randomised controlled trials, without significant variations in the directions or degree of results. **Or** Evidence obtained from at least one properly designed randomised controlled (preferably multi-centred) double blind trial.
Medium	Evidence obtained from well designed controlled trials without randomisation. **Or** Evidence obtained from well designed analytical studies preferably from more than one centre or research group, including epidemiological cohort and case-control studies. **Or** Evidence obtained from multiple time series with or without intervention, including within country and between country population studies.
General	Descriptive studies, case series or reports of relevant expert committees.

It is acknowledged that there is a dearth of evidence available to inform practice and that there are many ways to introduce evidence into the clinical setting including the availability of published research, clinical expertise and patient preference. Using EBP in delivering care can be achieved when the process is interwoven in the delivery of care. Critiquing research publications for credibility, integrity and scientific merit is necessary in determining whether findings should be used in developing research based protocols or if findings are ready to be used in practice. Mateo (2001) identifies three phases for using evidence-based practice in providing care: obtaining evidence, monitoring the use of evidence and evaluating the use of evidence in practice. Incorporating research evidence into practice can be done in several ways. EBP should be an integral part of clinical nursing practice, not a burden to be carried out as an extra responsibility. In 1998 Straus and Sackett stated that general physicians would need to examine 19 articles a day for 365 days of the year if they were to keep abreast of the medical literature (Straus and Sackett, 1998) which is obviously impossible and alternative approaches need to be considered. Guidelines and protocols are perhaps the most widely advocated mechanism and have been heralded by many as a panacea for the problems associated with the rising costs of health care and variations in clinical practice provided they are evidence based. They offer the busy health care practitioner an accessible and practical means of ensuring patients receive care that is considered to be the best (Turner-Warwick, 2000). They also provide a measure by which care can be audited.

At a time when the focus of health care is on using resources wisely and providing the best care, it is important that health care professionals successfully collaborate with colleagues, patients and their families in measuring outcomes of care that could contribute to the development of evidence base practice.

There are two ways an ICP can support the implementation of evidence into practice. Firstly, they can function as a template to incorporate guidelines (both local and national) into practice. Evidence based practice can be used for groups of patients or population. The terms used to describe these activities vary between documents, sometimes called evidenced based health care, evidence based management, or evidence based policy making. Secondly, the development of an ICP can provide staff with a broad process approach to problem solving, whereby multidisciplinary teams come together to debate and agree the best way to treat and care for a particular patient group. The multidisciplinary nature of clinical teamwork means that all members of the team should understand and share the philosophy about the purpose and rationale for their interventions. Furthermore, variance recording and analysis can be used as a mechanism to change the ICP based on locally generated evidence (Johnson, 1997; Layton, 1993). Variances are what health care professionals record when, through their professional judgement, the patient is not following the agreed ICP. Additionally, ICPs can provide the opportunity for research to be presented in a way that facilitates practitioners' understanding and use. An annual review of the ICP alongside available evidence to support the practice within the ICP ensures that the procedures are based on knowledge and support the principles of evidence based practice, rather than speculation, which should ultimately lead to quality improvements in practice e.g. the timing of when an in-dwelling catheter should be removed.

Several advantages for using an ICP to deliver evidence based patient care are highlighted in the literature. ICPs are claimed to improve quality through embedding evidence into practice (Layton, 1993; Morgan and Layton, 1996; Morris and Mylotte, 1995; Riches et al., 1994), contribute to the clinical governance agenda and meet the requirements of reducing cost. *The strategy for nursing* (Department of Health, 1999) emphasised the need for nurses to develop further the capability to lead and participate more fully in health care research and multidisciplinary audit. ICPs are one mechanism that help nurses structure how to make decisions that are accurate, timely and apply evidence in the practice setting.

1.4.3.4. Clinical audit

Links with clinical audit are easily established with ICPs through variance analysis. Variance analysis is reportedly used extensively in the USA and UK as a method of evaluating patient care, and can also be used to inform future developments of the ICP (Cairns and Sheppard, 1997; Cheater, 1996; Hale, 1997; Johnson, 1994; Moody, 1995; Morris and Mylotte, 1995; Nelson, 1997; Riches et al., 1994). Analysis of the variances over time provides useful trend data that can be fed back to revise the ICP and inform the quality improvement process.

1.4.3.5. Managing risk

The identification and reduction in risks (individually and corporately) has gained momentum within the new NHS. Swage (1997a) argues that clinicians are under increasing pressure to provide effective risk management strategies, and ICPs are one such tool to assist in this process. Wilson (1997a) states that ICPs will improve the documentation and communication of patient care, and the process and quality of health care delivery, thereby reducing risk. Swage (1997b) continues to argue that the care recipients will also benefit from ICPs, as they will be assured a minimum standard of care.

1.4.3.6. Government policy development

1.4.3.6.1. National Institute for Clinical Excellence

In 1998 the National Institute for Clinical Excellence (NICE) and the Commission for Health Improvement (CHI) were established to support health care professionals in defining, delivering and monitoring the quality of patient care. CHI was perhaps seen as the most threatening element of the clinical governance reforms as it provided an external review of practice that had the power to close services and or halt practice or services immediately. The CHI review also awarded health care organisations with stars for their performance (from zero to three, the higher the number of stars the better the performance). The move towards an external agency represented a marked shift from previous monitoring mechanisms that evolved around peer review or reactively when there was a crucial incident or public outcry.

1.4.3.6.2. National Service Frameworks

To complement the new infrastructure, National Service Frameworks (NSFs) were developed. The aim of the NSFs was to provide a set of national standards for the provision of specific care groups across all health care organisations, focusing initially on heart disease, care of older people and cancer. The emphasis of NSFs was on effectiveness and efficiency rather than cost and activity. The government also started to publish annual performance figures for each health authority and hospital in the country reflecting mortality rates and excessive lengths of stay. The reforms set out in *The New NHS* (Department of Health, 1997) and subsequently reinforced in *The NHS plan* (Department of Health, 2000) have been described as the most fundamental and far reaching reforms the NHS has seen since 1948 and they reinforce many of the principles and structures set out in clinical governance.

In summary, the way ICPs have been initiated in the UK differs from the USA. In the UK, the focus of the NHS reforms is on the need to increase efficiency and quality, and to widen choice. This is in contrast to the USA, which has implemented ICPs to control spending. Achieving improved efficiency without loss of quality in direct patient care underpins many of the challenges facing health care organisations (Department of Health, 1997). However, several health care organisations have embraced ICPs without any real evidence of their effect on patient care, providers or health care settings.

1.5. Development of the major abdominal ICP

A review of the literature highlighted two distinct conceptual aspects of an ICP. Firstly the hypothetical benefits to the patient group for which the ICP had been developed, and secondly, the process of development and benefits which result from that development process. The process of the development of an abdominal hysterectomy ICP from an action research study conducted in 1997 by myself (Debbage, 1997), and the purported benefits of the development are now considered. The benefits to the patient group form the basis of the rationale for this study and are considered in the methods chapter.

As previously discussed, government directives made it imperative that those working in health care examined their practice to ensure that is was evidence based, of high quality and cost effective (Department of Health, 1997). The emergence of clinical governance made it particularly important to apply existing knowledge to clinical practice (Department of Health, 1999). The development of ICPs was high on the agenda of many health care organisations in the mid to late 1990s. Indeed, the Director of Nursing where the study was undertaken had requested that each speciality develop one ICP per year to support the quality improvement process. The main aim of the quality improvement process was to improve health care delivery continually by measurement, review and refinement of processes (Kinsman, 2004). ICPs fitted well with the NHS modernisation agency work on protocol-based care and contributed to meeting the clinical governance agenda (Department of Health, 1999). ICPs were also seen as a mechanism to record activity undertaken clinically, and improve record keeping in line with the then United Kingdom

Central Council for Nursing, Midwifery and Health visiting requirements (UKCC, 1998). The UKCC (1998) stated that good record keeping should promote high standards of care, are an important means of communications with the multidisciplinary team, promote detection of changes in the patient's condition at an early stage and act as a record of the care delivered to the patient. The UKCC stated that the record should be made at the time of the care, written legibly, be clear and unambiguous, accurate and serve the best interest of the patient. It was the intention that the ICP would fulfil the necessary requirements outlined by the UKCC (1998). These requirements have since been updated and included in the Nursing and Midwifery Council guidelines on record keeping (NMC, 2004). Indeed, it was due to the perceived benefits of having a clear outline of care (with all staff groups being explicitly aware of their role) that I first became interested in ICPs. As a new staff nurse to the speciality of gynaecology I had never understood why specific treatments were non evidence based i.e. left to the discretion of the individual and non explicit i.e. routine activities were not clearly stated anywhere. I felt that a new system where routine practice could be evidence based and explicit must maintain or raise standards, and ICPs appeared to be a mechanism to achieve this.

Gynaecological services within the City of interest were delivered on two sites i.e. there were two hospitals within the same City that provided gynaecological care. Site one was on the north side of the City, whereas site two was on the southern side of the City. Within the UK it was common practice to have similar services provided from different hospitals within the same City. The services had been developed based on the need of the local population and driven by the political agenda of the time. The services provided and the patient/ client group are proposed as being similar on both sites, with the exception of ICP development and use. However, the similarities and differences between the two sites are further explored and expanded upon (e.g. patient demographics) in detail in chapter three. Site one had developed and implemented ICPs, whereas site two had continued to use traditional methods of health care planning, delivery and evaluation.

1.5.1. Action research project

A small working group with the remit of developing ICPs, within the speciality of gynaecology at site one, was formed in 1996 through an open invitation to all staff members (within the speciality of gynaecology) with an interest in care planning. Clinical leadership is essential both in terms of the clinical champion and the ICP co-ordinator (Currie and Harvey, 1998). Membership was dynamic due to the open nature of the group but generally consisted of a nurse manager, medical consultant, senior ward sister and a couple of staff nurses (one of which was myself, who had been given the lead in practice development) to ensure clinical leadership and engagement.

Lowe (1998) states that ICPs work best for patients who have a predictable course of care. The group depicted a simple journey and developed this into an ICP, starting with a number of smaller procedures, treatments and operations e.g. day-case surgery, colposcopy treatment and termination of pregnancy. Genuine collaboration among multidisciplinary staff, ownership by clinicians and targeted education are identified as central tenets to the successful implementation of an ICP (Currie and Harvey, 1998). Underpinning the design and implementation process was the belief that team involvement would lead to ownership, acceptance and usage of the ICP. The group met fortnightly for 90 minutes to discuss, critique and evaluate the development of ICPs within the speciality of gynaecology. The group also acted as a support network for members involved in leading the change initiative.

A literature review highlighted that there were various definitions, formats and layouts for ICPs. Within the working group it was agreed that the ICP would include information expressed chronologically. Events would be grouped under key headings, and organised within a 24-hour period. Space would be included for signatures allowing the ICP to replace existing documentation. The ICP supported identification of specific outcomes or targets and offered staff a way of streamlining documentation and systematically evaluating care. The layout was also acknowledged as a checklist or prompt, ensuring care processes were not missed, with the aim of providing more timely and appropriate treatment. The ICP was procedure specific and provided a way of challenging and tackling variation in practice, especially among medical clinicians. The group decided to develop an ICP for a major procedure, and following much discussion agreed on an abdominal hysterectomy ICP. A total abdominal hysterectomy involves removal of the uterus and cervix through a vertical (laparotomy) or, more frequently, midline incision (bikini line). An oopherectomy (removal of the ovaries) often accompanies a hysterectomy. Despite the procedure being relatively straightforward the recuperation period can be far from standard and many women experience problems after surgery. Although the ICP was being developed for patients with a common condition, the team agreed that a medical and nursing assessment would still be required to allow staff to explore and document details from a professional group basis. The nursing assessment was based on the activities of daily living (Roper et al., 1983) and kept the title of 'nursing assessment'. The ICP replaced the clinical record and remained paper based. The assessment was undertaken in the pre-admission clinic and included the expected date of discharge highlighting any potential problems (support at home, transport home) that might delay discharge. Each patient received an information leaflet about the forthcoming operation and recovery period. The ICP also ensured consistent information was delivered to individual patients. The ICP itself became a document that facilitated the education of the patient, aided the orientation and skill development of staff and improved the continuity of care by enhancing the multidisciplinary approach to gynaecological care.

Until the development of the total abdominal hysterectomy ICP no local form of evaluation or research had been included in the development of ICPs at the local hospital. It was agreed that a formal process for developing the total abdominal hysterectomy ICP would be advantageous and a member of the ICP working group would lead this work. I became the lead for the project and the study formed part of a Masters Degree programme. Various research and audit methodologies were explored to determine the most appropriate way forward. An action research framework was used as it allowed the development of the ICP for women having a hysterectomy to be progressively modified to adapt the needs of the multidisciplinary team and clinical environment. The 'mutual approach' (Hart and Bond, 1995) was adapted for the study using a four-step framework of planning, acting, observing and reflecting, which was repeated as necessary. The emphasis was on collecting multiple representations and presenting the evidence to the multidisciplinary group. Action research is defined as a process of collaborative investigation, which develops knowledge to solve problems and bring about change (Hart and Bond, 1995). Action research was seen as a collaborative approach to reflective practice leading to sustainable change due to it being firmly rooted in human values and behaviour placing the responsibility for change within teams in their workplace rather than with managers or policy makers (Lewin, 1946). The benefit of using action research was that change actions were based in real time situations. The researcher recorded field notes from meetings in the form of a diary. The field notes allowed reflection of discussions and developments of the ICP. The problem focus of action research was used to emphasise the views of users of the ICP. This process was positive in terms of multidisciplinary engagement and ownership but had limitations regarding conclusions around the patient's opinion, the effectiveness and efficiency of the ICP and generalisability of the conclusions. The strength of the action research approach lay in the opportunity for team learning and change that was grounded in the context of the service and pursued through collaboration. A 'critical friend' was employed to ensure the researcher did not distort perceptions.

The process of development for the total abdominal hysterectomy ICP started with a review of the literature on gynaecology ICPs and contacting other organisations that had developed and implemented ICPs within the speciality. The group reviewed the gathered literature and concluded that there were no existing ICPs that were suitable for local introduction and a new locally developed ICP was necessary. The idea that several practices, when used in combination or as an ICP have a greater effect on the patients was agreed i.e. the whole is greater that the sum of the parts. The ICP took the format of assessment, a sequential daily expectation sheet, progress notes (variance reporting) and a discharge summary (see Appendix 1 for an example of the full ICP). The specific practices identified for the abdominal surgery ICP relied in clinical consensus and where available established clinical guidelines e.g. anti-embolic measures. A review of the interventions associated with total abdominal hysterectomy surgery revealed different practices among different health care professionals. Care was lacking an evidence base and tended to follow tradition and medical staff preference. The ICP provided a mechanism for establishing best clinical practice, reflective of evidence where possible. The ICP underwent fifteen iterations and took a total of seven months to reach a model that the group were in agreement to pilot. Prior to piloting the ICP a structured teaching schedule was established for all members of the multidisciplinary team. Currie and Harvey (1997) recommend that an educational programme is one resource required as a success factor.

The improvement and involvement component of action research is about all stakeholders being involved in developing the change content and process. The content of the action research is defined from within the team rather than by an outside agency or strategy. Improvement is generally measured from the perspective of professionals (Hart and Bond, 1995). Questionnaires were developed and distributed to a convenience sample (n=24) of the multidisciplinary staff working on the ward where the ICP was piloted. Twenty questionnaires were returned for analysis; an 82% response rate. The responses were generally positive around the themes of multidisciplinary communication, documentation and evidence based practice. The majority recommended a comprehensive teaching package for any future ICP implementation. The most significant change to the ICP was to broaden the patient group it covered and therefore reflect all major abdominal gynaecological surgery. All of the suggested changes to the ICP were implemented and included in the updated ICP (Appendix 2). The major abdominal surgery ICP was produced. The pilot coupled with questionnaires was aimed at identifying potential problems and to engage the multidisciplinary team with the ICP.

1.6. Research problem

Although the local action research study did provide some valuable information about the ICP it was of limited value. The study did not conclude whether ICPs were effective or whether they should replace existing (traditional) methods of care planning and delivery. There continued to be growing support for the development and implementation of ICPs within the UK health care system. However, there remained limited evidence to demonstrate whether ICPs lead to improvements in patient care, supported providers and increased efficiency in health care systems. It was, therefore, necessary to empirically study ICPs within the area of interest to help inform local decisions and to contribute to the evidence base around ICP use in the UK health care setting, thus reducing the knowledge gap. Before determining how to take this forward it was essential to undertake a systematic and critical appraisal of the existing literature on ICPs, and this is reported in the following chapter. Following the literature review it was necessary to determine the most appropriate research method to examine ICPs, and this is reported in chapter three.

1.7. Structure of the thesis

The thesis is divided into a further four chapters. Chapter two provides a critical appraisal of the relevant literature surrounding ICPs and is divided into specific areas of interest. Firstly, the developments of ICPs are explored in relation to their country of origin. The NHS is then compared with other health care providers to allow meaningful conclusions to be drawn. A summary of the current clinical use of ICPs follows, with a focus on the relationship of the ICP on outcomes at patient, provider and health care system level. Finally, the benefits and drawbacks of ICPs are discussed with particular emphasis on quality. It is my intention in chapter two to provide sufficient information to conceptualise the research. Chapter three presents the study methodology and sets out a rationale for the design, variables of interest, sample, methods and analysis. The remaining chapters present the results of the investigation followed by interpretation and discussion of the results in relation to other studies and literature. Limitations are included in the final chapter along with the implications for clinical practice, nursing research and nurse education.

1.8. Conclusion

This chapter has outlined the purpose of the thesis. An overview of the concepts associated with ICPs and their emergence within the UK health care system has been presented. The various terms surrounding ICPs were summarised to provide clarity and understanding for the reader. A reflection of the NHS, and its priority to deliver high quality individualised health care was explored with the intention of suggesting that ICPs may be a way forward within the UK. The confounding influences on the study including an overview of the development of a local ICP leading to a research study have also been examined. This was followed by an outline of the research problem. Finally, a description of the subsequent chapters of the thesis was provided. The research study will determine the influences ICPs have on specific patient, provider and health care outcomes.

2. Chapter Two: Literature review

2.1. Introduction

This chapter provides an overview of the relevant literature surrounding integrated care pathways (ICPs) to gain a more detailed understanding of their origins, where they are being used and why. The purpose of the chapter is to identify and critically appraise the literature surrounding ICPs, review previous research studies that have tested the significance of ICPs on patient, provider and health care systems and deduce what variables show an association with ICPs. The critical review of existing literature will also identify any gaps in the knowledge base around ICPs, which in turn, will help to justify the rationale for this research study. Additionally, the specific research questions will be strengthened through the review of the literature.

2.2. Integrated care pathway literature

A systematic approach to reviewing the literature was undertaken and followed recommendations by the Centre for Reviews and Dissemination (2001). Databases used included CINAHL, Cochrane library, Medline, York Centre for dissemination of information and the RCN library facilities. Boolean operators were used to increase the precision of the search and various text words and MeSH search terms were used (Appendix 3) as they were assumed to relate to the same management style of patient care. A standard data extraction form adapted from Crombie, (1996) was used (Appendix 4) to ensure literature was critiqued using a comparable framework. The framework provided a standard format from which to ascertain specific relevant information and ensure that all the literature was critiqued using the same questions. The data collection forms supported management of the literature including speciality specific ICP developments, the different methods used and the emerging themes. Australian, Canadian, European, Singapore, Taiwan, UK and USA literature was included as these countries had developed and introduced ICPs into their health care systems. The search was limited to text that was produced in English. The bibliography of relevant articles was examined for relevant citations and appropriate articles obtained. The literature was traced from 1980, as this is when, under the topic of managed care, case management and ICPs were introduced into the nursing literature.

The literature review is presented under the emerging themes. Firstly an overview of managed care, case management and ICPs are presented. This is followed by a critical appraisal of the developments within the USA and Australia, preceded by the UK. A review of the current use of ICPs with any evaluation material associated with these is presented by speciality. Finally, outcomes associated at patient, provider and health care system level are presented.

2.3. Managed care, case management and ICPs

As outlined in chapter one, health care organisations had introduced the concepts of managed care, case management and ICPs as mechanisms to direct, co-ordinate and control quality patient care whilst simultaneously controlling costs. Following the introduction of the managed care initiatives in the USA it is reported that health care costs reduced by 7% in 1993 and 6.4% in 1994 (Gottlieb, 1996). Managed care is a business model with case management being the service model in which outcomes are the product (Zander, 1988). Case management has been seen as a multidisciplinary approach to care delivery, identifying specific patients and managing their care. The aim of case management is to create a controlled balance between quality and cost (Lee et al., 1998). The ICP becomes the tool of the case management process facilitating the plan of care in a sequential manner. The ICP allows the multidisciplinary team to co-ordinate care by setting out all the activities involved in the care of a patient with a defined condition. The ICP structures the plan of care so that each patient progresses towards a set of desired outcomes with a predetermined expected date of discharge and, thereby length of stay.

2.4. United States of America and Australian developments

In a survey conducted by Hospital Health Networks it was acknowledged that the majority (92%) of USA hospital executives described the development and introduction of ICPs as a top down management strategy (Lumsden & Hagland, 1993). The hospitals required a major commitment in terms of people, time, cultural change and infrastructure. The ICPs had generally been developed as a way of increasing the focus on patient care while using resources more efficiently. However, concerns have been raised about the concept and underlying principles of managed care, specifically from medical professionals. ICPs can be seen as restricting choice for individual doctors, modifying clinical practice through the introduction of guidelines and transferring specialist services to selected areas. However, other professional groups and, indeed, specific authors, believe that the impetus of managed care is a focus on the delivery of quality patient centred care (Ebener et al., 1996).

Spath (1994), however, argues that several health care organisations have developed and implemented ICPs from a bottom up approach but recognises that this only works to a particular level and that senior level support is essential. Grant et al. (1995) emphasise the need for health care organisations to develop structures to support ICPs. Team approaches have also been discussed with the aim of identifying barriers, problems solving, introducing change and devising strategies to support the ideas (Abreu et al., 1995; Bultema et al., 1996; Clark et al., 1994; London, 1993; Olivas et al., 1989; Reinhart, 1995). In many instances the key responsibility for the development and introduction of the ICPs has been placed on nursing staff; however, it remains essential to ensure multidisciplinary collaboration exists during the planning and managing stages (Zander, 1988).

Issues relating to documentation were cause for significant discussion in the literature i.e. whether the ICP should replace existing documentation and become the permanent record. It is now largely recognised that the ICP should replace existing documentation and become part of the permanent patient record (Joseph et al., 1997; London, 1993; Nyberg and Marshke, 1993; Reinhart, 1995; Riley, 1998; Scott and Cowen, 1997) as this helps to streamline documentation and reduce duplication. Zander (1988) also states that ensuring the ICP becomes a permanent part of the medical records ensures accountability. In most published instances the ICP has, therefore, become the permanent patient record.

Education of all staff using or coming into contact with the ICP was another crucial factor prior to implementation (Grant et al., 1995). The education sessions could be used as a method to provide staff training and also as a consultation and feedback mechanism for the specific ICP (Newman, 1995).

The success of ICPs to date has relied on effective leadership, resources to set up the initiative and education and training programmes for all staff to access prior to implementation (Newman, 1995; Zander, 1988). Evaluation of patient care whilst using ICPs has occurred predominately by concurrent variance analysis. Variances are exceptions to what is expected within a given ICP e.g. development of a post operative infection. Analysis of the variances over time provided useful trend data that were fed back, to change the ICP and inform the quality improvement process (Coffey et al., 1992; Reinhart, 1995). For example, if a particular group of patients developed a specific post operative infection, this could be investigated to ensure it wasn't due to non use of antibiotic cover. Some ICPs have been evaluated in a more formal manner with length of stay being used as an indicator of costs. The specific studies are reported later in the chapter under the ICP speciality. The overall barriers to ICPs have been identified as: a lack of medical staff support (Clark et al., 1994), a belief that ICPs do not acknowledge individual patient uniqueness and that ICPs are too inflexible and prescriptive (Capuano, 1995).

One of the significant differences between the introduction of ICPs within countries other than the UK is the use of case managers. The case manager is predominately a nurse who manages a caseload of patients, usually with a similar treatment, procedure or diagnosis. The role of the case manager differs between institutions from matching and co-ordinating services to ensuring that the patient receives all planned interventions within a given time (Lee et al., 1998). At a similar time (i.e. in the 1990s) all members of the multidisciplinary team tended to take on the role of case manager in the UK, with no one person having overall responsibility.

Gibb and Banfield (1996) published a paper providing background to ICP development and implementation within the Australian health care system.

Gibb argued that importing ICPs in their current form as devised in the USA would not be appropriate for Australian health care and may in fact be detrimental to nursing practice. In Australia there had been changes in health care funding and the framework of managed care had been introduced, but there had been limited quantitative examination of how ICPs were being received in the clinical arena. Gibb undertook a research study to examine ICPs efficacy as a tool for clinical practice using an action research methodology. The ICP was positively evaluated in two areas; firstly the team felt that, by generating the tool, communications and awareness across professional lines improved, and secondly, it was recognised as being an important educational tool for new staff. However, the ICP did generate some criticism as staff felt it was too inflexible to meet individual patient needs. The medical staff in particular also felt that a medical diagnosis alone was an inadequate basis on which to predetermine treatments or try to predict length of stay as social conditions and or functional status were also important.

Therefore, although literature published from the USA and Australia has implications for the current NHS, caution should be given to direct application to the UK health care system (Newman, 1995). Cultures, individuals and expectations are different. Additionally, health care systems are funded uniquely and therefore need individual consideration.

2.5. Developments within the United Kingdom

A major concern about managed care was that it focuses too much on reducing or containing cost at the expense of quality (Sherrill, 1995; Dalen, 1996; Fuchs, 1997). The way that ICPs have been initiated in the UK differs from developments in the USA. In the UK, ICP developments were a result of the government reforming strategies (Department of Health, 1997). The major difference between the USA and the UK health care systems is that the former has always focused on treating individual patients and ensuring a wide availability of the latest technology for those with third party health insurance. The UK on the other hand has always recognised the need to treat the whole population, regardless of their ability to pay. The move towards patient focused care, widening choice, improving quality, increasing efficiency and supporting clinical effectiveness and evidence-based practice are a direct result of the NHS restructuring. Hurst (1995) defines the characteristics of patient focused care in the UK as re-structured services and care teams, cross trained, multi-skilled staff and ICPs driving working patterns. ICP development across the UK has either been in a response to patient focused care (Fuchter and Garside, 1992; Haigh, 1996; Heymann, 1994; Layton, 1993; Morgan, 1993; Morgan and Layton, 1996) or as part of the movement towards integrated case management (Cairns and Sheppard, 1997; Kitchiner, 1997; Morris, 1997; Stevens, 1997).

Swage (1997a) argues that clinicians will be under increasing pressure to provide effective risk management strategies, and that ICPs are one such mechanism to assist in this process as they demonstrate the presence of clinical guidelines and effective monitoring. Thomas et al. (1999) carried out an extensive literature search on the effectiveness of guidelines in professions allied to medicine. Findings from this review provide some evidence that guideline driven care can be effective in changing the process and outcome of care provided by professions allied to medicine. However, most of the studies reviewed were in relation to nursing and there was insufficient evidence to make firm conclusions about the effectiveness of the different dissemination and implementation strategies. Swage (1997b) continues to argue that the recipients of care will also benefit from ICPs, as they will ensure a minimum standard of care for all. Wigfield and Boon (1996) state that ICPs are the way forward for NHS Hospitals by describing them as a method of managing care by ensuring appropriate, high quality cost effective treatment is given. At the same time government restraints are also being met by involving the patient in decision making and information giving.

The debate around education and documentation within the UK is similar to that of other countries. Education and training strategies are viewed as essential to support the understanding, ownership and acceptance of ICPs (Fuchter and Garside, 1992; Johnson, 1997; Layton, 1993; Morgan, 1993; Wilson, 1997a). The role of a co-ordinator is also described (Cheater, 1996; Johnson, 1997; Riches et al., 1994) and credited for much of the success of the ICP implementation. Walsh (1998) states that ICPs have replaced traditional nursing care plans in many areas and that the pre-printed, standardised ICP is valuable for releasing nurses' time to provide the necessary level of care. This is supported by Morgan (1993) and Morgan and Layton (1996) who state that time spent documenting care results is less time being available for direct patient care. Layton (1993) identifies a 30% reduction in the time spent documenting care through the use of an ICP. Layton does not, however, continue to discuss how this conclusion is reached and, therefore, the accuracy of it is questionable. A discussion of the aims, implementation and benefits of the ICP is then given with the positive impression that 40 ICPs are in successful use in one UK Hospital. There is no account given of the methodology, data collection, analysis and therefore the conclusions suggesting a 30% reduction in writing time and that 40 are being used successfully cannot be confirmed. Hurst (1995) supports the argument that ICPs can simplify documentation in several ways and that, in some instances, documentation time has been reduced by half. Again, this is not substantiated, as no details of how this conclusion is reached are given. Tingle (1997a) argues that ICPs can support practitioners legally as they can show that clinical decisions were based on recommended guidelines.

The evaluation of ICPs tends to mirror what has happened in other countries i.e. through clinical audit of patient variances, data is used to inform future ICP developments. Variance analysis as a mechanism for evaluating ICPs is used extensively in the UK (Cairns and Shepherd, 1997; Cheater, 1996; Hale, 1997; Johnson, 1994; Moody, 1995; Morris and Mylette, 1995; Nelson, 1997; Riches et al., 1994).

2.6. Current clinical use of ICPs

2.6.1. Overview

Currie and Harvey (1998) found that 86% of all UK NHS Trusts used ICPs to some degree to deliver health care. De Luc (2000) supported this claim stating that the use of ICPs has grown since their origins in the mid 1980s and can be found in most NHS Trusts and private hospitals throughout the UK. In 1999, Currie and Harvey (1999) surveyed 471 Trusts in the UK in relation to ICP use. A total of 330 Trusts responded (70%) with 289 of the responses stating that they used ICPs to deliver care. Out of the 289, 22 Trusts were randomly selected to take part in a detailed study of ICP development, implementation and evaluation. The final number of Trusts reduced to 16 resulting in a total of 76 staff being interviewed. The survey illustrated that, at a strategic level, ICPs were seen to promote organisational development because they facilitated a more structured approach to care provision. They led to a reduction in the number of complaints, litigation and compensation, and they also supported risk management and improved standards of care. On a clinical level, ICPs were found to support the management of high volume, high-risk patient populations through addressing process problems and deficiencies in care. Currie and Harvey (1999) concluded that ICPs could provide an opportunity for greater collaboration and understanding between professional groups, as well as facilitating multi-professional education. Perceived benefits for patients included increased patient satisfaction, improved information, education and communication. Patient education and communication were thought to have improved as patients could see how their care was planned. Having the ICP available at the bedside also gave patients the means to question and challenge staff if something did not happen. Finally, Currie and Harvey (1999) suggest that multidisciplinary communication improved because patients were not continually being asked the same questions. Similar barriers to those identified in the USA literature were also the case in the UK. However, caution should be applied when reviewing the conclusions drawn from the survey, as it was the opinion of staff using the ICPs and not from a patients' perspective.

2.6.2. Systematic reviews

In 2002 Renholm et al. undertook a systematic review of the literature surrounding ICPs. The purpose of the review was to find out how ICPs influenced patient care, and to establish in which diagnostic related groups the research into ICPs had been done. The review stated that ICPs had been designed for using resources better, maximise quality care, and minimise delays in diagnosis and treatment. Nursing and medical articles were reviewed using Medline and CINAHL from 1982 to 2000 using keywords e.g. critcal pathways, nursing process, ambulatory care, ambulatory surgical procedures and short stay surgery (as the authors believed that ICPs are named differently throughout the literature). The results of the review confirmed that ICPs had frequently been developed and implemented as tools to enable providers to identify, measure and analyse care processes and desired outcomes. Patient outcomes were defined in terms of patient satisfaction, patient education, continuity of care, continuity of information and quality of care.

Renholm et al. (2002) concluded that patient satisfaction seemed to increase with the use of ICPs; however, they did state that there had been very little research undertaken to measure patient satisfaction as a result of introducing ICPs. Patient education programs had a positive effect on the results of surgical nursing care, in that, patients had better post-operative outcomes when they had been taught what to expect throughtout their surgical experiences. Continuity of care was improved with the use of ICPs as the ICP helped the staff to think about patient care from a team perspective. ICPs also improved continuity of information by providing patients and health care professionals detailed information about the entire pathway of care. Finally, the researchers concluded that ICPs improved the quality of care. Quality of care included appropriate antibiotic usage, improved satisfaction by means of a post discharge survey, a reduction in re-admission rates, complications and length of stay. A reduction in the cost of care was associated with a decreased length of stay and through a reduced use of tests (laboratory and radiology). Overall, a positive impact on patient care was concluded by Renholm et al. as this was seen to be true in most studies and there was no evidence of any negative effects. However, Renholm et al. did state that some studies resulted in no influence on patient outcomes. The most significant finding was that most of the ICPs were rarely evidence based, and had been developed based on expert opinion.

Renholm et al. also reported the methodology used within the different studies finding that patient chart review was the most common method, followed by structured questionnaires, a combination of patient chart review and structured questionnaires and finally, the smallest group of studies were those that were done by interviewing patients or professionals. Sample sizes were reported as ranging from 50 to 500 participants. The most common design was stated as a comparison of results before and after the implementation of an ICP. Overall, the paper by Renholm et al. (2002) is very useful as it provides an overview of ICP developments, however, it is difficult to differentiate the outcomes between care specialities e.g. gynaecology, orthopaedics and therefore translate this into clinical practice. Additionally, there was no critical analysis of the methods used within the specific studies and therefore it is difficult to know whether the results reported were significant either clinically or statistically.

Young-Ju and Soeken (2005) reported on a meta-analysis of the effect size of hospital based case management on hospital length of stay and re-admission. Hospital length of stay was taken as the average number of days of hospitalisation per patient during the individual study period. Re-admission rate referred to the proportion of patients re-admitted at least once within the duration of follow up established for each study. A search strategy with key words using computerised databases e.g. CINAHL, MEDLINE, HealthSTAR was employed. One hundred and twenty nine articles were initially identified, but only 25 were reviewed (by two independent reviewers) due to fact that they were the only ones that reported the effect of hospital based case management. Additionally, for the studies to be included in the review they needed to be randomised, adult samples that stated length of stay or re-admission rate as an outcome measure. This resulted in only 12 studies qualifying for inclusion in the meta analysis. Young-Ju concluded that the overall case management interventions were not significantly effective in reducing length of stay and re-admissions with the exception of patients with heart failure, where the opposite was found i.e. case management strategies were significant in reducing length of stay.

Wuiff et al. (2008) published a systematic review of literature surrounding case management and ICPs, specifically in relation to cancer care and quality outcome measures. The intention was to determine if either case management or ICPs improved the quality aspects of cancer care. Over 654 articles were identified and retrieved but on examination only seven were included for in-depth analysis. The authors concluded that from the seven articles there were very diverse interventional characteristics (depending upon the cancer primary), methodological aspects (from staff opinion to patient outcomes) varied including the outcomes studied and therefore findings. Wuiff et al concluded that no firm conclusions could be drawn from the existing literature findings but that more trials were needed.

2.6.3. Orthopaedic surgery ICPs

One of the first ICPs to be developed and introduced in the UK was for total hip replacements. Dowsey et al. (1999) carried out a randomised, unblinded, controlled trial on patients undergoing hip and knee arthroplasty. It concluded that patients in the ICP group had a shorter mean length of stay. It is one of the first randomised controlled trials to evaluate the effectiveness of an ICP. Strengths of the study include random assignment of patients to groups and the follow up of all participants in the study at three months. However the limitations of not knowing whether the quality of the charting differed between the groups could bias the results. The study would have also been strengthened if patient satisfaction had been examined. Additionally, all the patients had attended pre-admissions clinic or the patient information seminar, and it would have been interesting to establish whether this had an effect of the final outcome and not the ICP alone as suggested.

Central Middlesex hospital introduced case management in 1991 (Morgan, 1993) through forming an in-house project team to develop care protocols, integrated information systems and maximise involvement of staff with patients. It is unclear how the team was constituted. The team presented the project as a radical alternative to traditional methods of care by looking at time spent on various activities and how well individuals communicated with each other. Pilot areas of orthopaedic and urology wards were targeted and used for data collection. Observational methods were discussed as the main instrument of data collection. Based on the findings, it was reported that care was not co-ordinated in an ordered or methodological manner, meaningful communication was fragmented and minimal, there was no agreed objective among separate professions, there was no clear desired outcome and the recording of patient care was held separately between the different professional groups e.g. doctor, nursing, physiotherapist. The study showed that 40% of nursing time was spent on direct patient care and 14% spent on documenting that care. From this information the study recommended the need for unitary records of care and core multidisciplinary assessment forms. Care protocols were written and subsequently introduced leading to multi-skilled staff and an un-fragmented approach to care. The clinical manager role (replacing the ward sister) was defined as establishing a framework for standards, co-ordinating the writing and updating of care protocols and ensuring that a concurrent multi-disciplinary clinical aim took place. The research concluded that clinical skills were developed, a high quality of care was predictable and that a bottom up approach to care was developed. From this paper it is difficult to draw any firm conclusions for future practice. The methodology was descriptive and failed to provide the reader information on how the conclusions and changes were appraised. The models appear to have been introduced with a lack of clarity about quality and collaboration. It does, however, give a good description of how the ward operates using ICPs.

Wigfield & Boon (1996) describe the implementation of ICPs onto an orthopaedic ward. They suggest that ICPs make it easy to identify reasons for delayed discharge, improve the use of limited resources at ward level, increase cost efficiency and improve quality of care. The improvement of communication, documentation and patient satisfaction is also acknowledged, but with no reference to the research or literature used by Wigfield and Boon (1996), it can only be concluded that the reflections are the author's personal view. Although this article is mainly descriptive and gives no empirical evidence to its findings for improvements of patient care it does offer a good insight into ICP development and introduction onto a ward.

The importance of introducing ICPs within orthopaedic nursing is acknowledged in a paper by Alder et al. (1995). Although the paper originates from the USA, some comparisons can be made to nursing in the UK. Case Management is discussed as the basis for care in which the patient is the focus. The research was conducted at a 1200 bed teaching hospital split over two sites. A case management system was used to determine the issues of cost versus quality. Length of stay and resource management were used to measure cost; however, quality measurement was not addressed. ICPs were concluded to enhance the multidisciplinary approach to care by outlining the expected outcomes for each day of the hospitalisation. However, the origin of this conclusion is unclear. Although some of the research was empirical, this was not clearly defined, and the majority of the literature was anecdotal.

A prospective cohort study of patients with a hip fracture is described by Harris (1993). Fifty one patients were assigned to a traditional practice group (control group) and 55 patients were assigned to an ICP group (experimental group). The same ward was used for both the control and experimental groups with a six month time period between the end of the control group and the beginning of the experimental group. It was stated that there was a time delay between the two groups to allow staff to become familiar with the ICP. The patient groups were not significantly different in age, mental status, marital status, accommodation, ambulation, fracture type or fracture treatment. There was a difference between the number of females (84) compared to males (22), although the author argues that this is not clinically significant and therefore no comparable differences between the two groups was seen. The experimental group was reported to have lower complications (p=0.01) and an improvement in the number of patients discharged before 14 days (p=0.047). The limitations of collecting data from clinical notes and the time delay in data collection (due to the six month gap) may have altered the outcome of both groups. Overall, this study provides insight into the potential benefits of ICPs from a service delivery viewpoint. Patient opinion of the care they received from both groups would have helped inform the quality aspect of ICPs.

Mabrey et al. (1997) studied the impact of an ICP for total knee arthroplasty. A retrospective cohort study was employed which examined complications, re-admissions, morbidity and mortality and function scores in two groups of patients. The study was undertaken in a 530 bed University hospital in the USA. The same surgeon was used throughout the study, with the first group of patients having care delivered using traditional methods during 1995, followed by the second group using the ICP during 1996. Only elective knee arthroplasties were included. Group one consisted of 11 patients and group two had 24 patients. With the exception of the knee score, data were gathered retrospectively from group one. The only difference between the two groups was that group two had more nonwhites (e.g. African American, Hispanic) than group one. No significant differences were seen on knee scores between the two groups; however, a significant difference between pre-operative and postoperative function scores was seen (p=0.05) with group two reporting better function. There was a significant average cost of hospitalisation saving of 11% from group one to group two. Additionally, length of stay was reported as reduced by a striking 57% from 10.9 to 4.7 days in group two. The researcher does state that the reduction in length of stay was largely due to effective discharge planning, which the ICP facilitated. This study highlights that improvements in efficiency at patient level i.e. reduction in length of stay and costs, does not mean a reduction in patient outcomes. It is difficult to identify the patient's views on this; however, as no data were reported regarding the patients' perceived experience.

In 2002, Douglas published an evaluation study looking at the consistency of criteria for a hip replacement ICP. Forty acute hospital Trusts were contacted (from the National Health Service Directory) for information regarding local developments of hip replacement ICPs. Among the Trusts that responded, 67.5% sent copies of their ICPs. Douglas (2002) supported the fact that there was a great deal of variation in ICPs and the way in which they had been developed by different health care organisation. The data were impossible to review in relation to the overall impact on patient outcomes, but the study did confirm that ICP development remained the responsibility of the local organisation.

Santamaria et al. (2003) undertook a 12 month prospective cohort study to compare the health related quality of life of 57 patients (28 having traditional methods and 29 having an ICP) for fractured neck of femur. A purposive sample was used to match groups on age and comorbidity status. Ability to understand English was also a neccesity due to the data collection instruments. Data were collected on the patients' health related quality of life using the SF-36. Santarmaria et al. (2003) concluded that there was a significantly higher role limiting emotional score in the ICP group compared to the traditional group. No other significant differences were seen between the groups around the patients' return to physical or mental health. Drawing comparable results from this study is difficult, due to the decreased power from a small sample size.

2.6.4. Surgical ICPs

In 1995, Miller et al. published some research of a pilot of a surgical ICP. The study was carried out on four, six bedded surgical wards over a three month period (Miller et al., 1995). The hospital was identified by name but there was no reference to its overall size or staffing levels. The senior ward sister was responsible for the education of the staff before the implementation of the ICP. Comments on how the staff felt using ICP was documented and these comments were then used to refine the documentation system before it was extended to other surgical wards. The documentation was further piloted in another three areas before formal introduction into the hospital. It is unclear how staff comments were collected or analysed to reach the final standard of documentation. It is highlighted, however, that the research team thought that it was essential to demonstrate the need to support nursing care with research. Although this is not discussed in the article the author gives the impression that the information is obtainable and easy to use for anyone working in that area.

The research led to a standard being created for record keeping, which met audit requirements and allowed accurate record keeping to become established. Improved patient care was demonstrated, as well as assisting in the education of students and newly qualified staff and improving the team spirit. How these improvements were made is not justified. The article does illuminate the disadvantages of developing and introducing ICPs as being time consuming and potentially misunderstood by ward staff. Although this article is descriptive, with no reference to the methodology, it does give an insight into the development and subsequent introduction of ICPs to the ward. It also places emphasis on the potential problems of introducing new concepts to patient care providers.

Muluk et al. (1997) reported a study undertaken in 1993 on non-urgent aortic aneurysm surgery. A reference group of 49 pre-ICP patients, 44 post introduction of ICP and a group of 34 patients following modification of the ICP were included. The second cohort of patients, having had care delivered with the ICP, were reported to have a marginally significant reduction in cost (p=0.09), a slight fall in length of stay (from 13.8 to 13.1 days) and mortality rate (4.1% to 2.3%) compared to the first cohort (reference group where traditional methods were used). However, a significant correlation of increased changes was attributed to fluid, with overload being diagnosed by chest radiograph. The ICP was adapted to reduce fluid administration pre-operatively and the same data were collected on another cohort of patients. The results of the third and final cohort of patients revealed that fluid overload was reduced from 73% to 24%, there was a reduction in cost (p=0.05) and the mean length of stay was reduced from 13.1 to 10.2 days; p=0.05. A multiple regression analysis was undertaken of all the ICP patients, and this showed that pre-operative renal insufficiency was a significant predictor of both increased length of stay (p=0.01) and cost (p=0.01) with age and coronary disease not being a predictor. No other data on patients' demographics or morbidity were reported, therefore, it is difficult to confirm whether the results were due to the ICP or individual patient differences.

A retrospective cohort design study on the introduction of a transverse rectus abdominis musculocutaneious (TRAM) breast reconstruction ICP was reported in 2000 by Hwang et al. All non ICP TRAM cases 18 months immediately prior to the introduction of the ICP acted as a control group. Outcomes assessed included length of stay, postoperative complications, total postoperative charges, and total costs in relative value units. Data were collected from hospital charts and billing records. Forty patients were treated in the non ICP TRAM group and 29 in the ICP group. Hwang et al. used ANCOVA (analysis of covariance) to control for patients' clinical characteristics. Length of stay decreased from six to 5.2 days (p=0.05), total postoperative charges were reduced from $8587 to $7744, and total postoperative relative value unit declined from 1686 to 1104 (p=0.007). Additionally, no increase in complications was observed following the implementation of the ICP. Although these results are interesting they must be considered within the limitations of the methodology used including the lack of discussion regarding the power of the study sample. One cannot be sure that the outcomes were not due to other initiatives supported at the time when the ICP was introduced. Additionally, no data were collected pre-operatively or on quality aspects of patient care.

Joseph et al. (1997) published on the initiation of an ICP at Vanderbilt University Medical Centre, Tennessee, USA for radical retropubic prostatectomy. The ICP was introduced in an effort to control costs and improve the quality of care delivered. Joseph et al. argued that an effective programme on reducing costs must focus on all aspects of care. Therefore, all the key components of the ICP were used as a baseline for comparison. Joseph et al. concluded that morbidity and complication outcomes were not compromised and appeared to be enhanced with the ICP. There were no changes in the incidence of wound infections, thromboembolic events or catheter related problems, and transfusion of blood products was virtually eliminated. Finally, over 95% of patients voiced satisfaction with their care. It is unclear from the paper however, of the methodology used to undertake the study, including selection of the subjects, the numbers included in the before and after comparison, whether indeed the groups were comparable, or identification of any of the data collection instruments. The conclusions are therefore of limited value.

A vascular ICP was developed and implemented by Becker et al. (1997) to determine whether outcomes were affected. Becker et al. state that haemodialysis vascular access related hospitalisation account for more than 20% of the USA end stage renal disease hospitalisation, with an annual cost approximating $675 million. Data were examined and analysed on hospitalisation, vascular access surgery charges, complications and patient satisfaction. Patients from prior to the ICP and patients on the ICP were used for comparison. The characteristics of the two groups were reported as similar on age, sex and etiology of disease. Implementation of the ICP resulted in an immediate and significant decrease in hospital days (from 85 to 82 days). The average length of stay was not significantly different within the ICP group. The ICP had a marked effect on average charges per patient reducing from $11,196 to $4,687. It is acknowledged that this drop in charges could be a result of the difference in percentage of patients in the non ICP cohort being covered by third party insurers. Observations, operating room use, laboratory and radiographic investigations all significantly declined for patients on the ICP. No differences were seen between the two groups on the use of intensive care support days. Patient satisfaction was determined by a three question follow up survey on the ICP cohort of patients only. There was a reasonable response rate (69%) to the questionnaire which demonstrated the majority were satisfied with their care. In conclusion the study by Becker et al. suggests that a vascular access ICP can reduce hospitalisation and cost while achieving acceptable outcomes including patient satisfaction. However, patient satisfaction was only captured through the use of three questions in a follow up survey and is not comparable to the pre-ICP group.

Joy et al. (2008) undertook a study to determine whether standardising postoperative care for ileostomy closure using an ICP would lead to improvements. The details of the methodology are scant and only provide the reader with the numbers included in the group when the ICP was in use (n=42). The authors conclude that the ICP resulted in a shorter length of stay with acceptable morbidity and readmission rates. However, there is little information regarding how these conclusions are drawn as no pre test or test group is discussed. The amount of time reduction is also not addressed so it is difficult to draw any meaningful conclusions.

2.6.5. Women's health ICPs

Empirical research conducted by Cohen (1991) in the USA has concluded that there are benefits from adopting a case management approach to patient care. The research aim was identified as 'the effects of nursing case management on the length of stay for patients having caesarean sections and to assess the cost of the delivery of that care'. ICPs are one element of the wider case management model and are referred to as critical paths within the research study. A large acute institution where the model was developed and implemented with existing staff was used for the study. Care was monitored through the use of critical paths; 128 patients were selected non-randomly giving a total of 768 days. A control and experiment group were selected. A quasi-experimental design was used and data collected on demographics, length of stay and related complications information. A nursing case management form was used to determine the average amount of nursing time spent on a patient and the data were collected over four to five months. Descriptive statistics on demographic data, cost accounting methodology were used retrospectively. The findings indicated that there was a significant reduction in patient length of stay from 6.02 days with the control group to 4.86 days with the experimental group. The actual time spent with patients on direct nursing activities increased in the experimental group by just over four hours during their hospital admission in contrast to the conventional method of nursing care. Unfortunately there is no indication of how the additional direct nursing activities were funded. The patients' demographic data were proportionally represented within each group for age, parity, foetal and maternal complications, number of caesarean sections and type of obstetrical analgesia/ anaesthesia used. The overall effect resulted in a decrease in the use of resources and cost, concluding that a great financial saving could be made annually by using ICPs. Although quality is not addressed in this study the results appear to accurately report the positive effects of ICPs on length of stay and ultimately cost.

Blegan et al. (1995) investigated the use of care maps for all women who had delivered by caesarean section during an 18-month period. The hospital was a tertiary level university hospital in Iowa, USA. A control (traditional methods of care delivery) and experimental group (ICP used to provide care) were established to determine the effect an ICP had on the length of stay, cost of care post caesarean section, patient rating of quality, physical recovery on discharge and opinion of care one month post discharge. Power analysis was used to determine sufficient participant numbers in order to obtain clinical meaningful results. There were 381 participants and each of these was approached individually by the investigator (who was purposefully not a member of the hospital staff) on the day before discharge and asked to complete a questionnaire and take part in a telephone interview one month later. The paper only highlighted that it was made clear that their responses would not affect their care, but no other material was made available for the reader. There was no statistical significance changes in demographic; however the majority of women were white, educated and married. The results concluded that the average length of stay was reduced by 13.5% and the average cost was also reduced by 13.1%. These results even remained low after controlling for co-morbid and complicating conditions. Perception of quality was given higher marks by the control group, as they believed they had more involvement in their care. Twenty one items addressing patient perception of quality of care came from a consumer satisfaction survey, which had been modified for hospital use. Questionnaires and telephone calls that were not followed up were addressed in the paper. Physical recovery scores did not change; and was assessed using validated scales adapted from Wolfer and Davis (cited in Blegan et al., 1995). The most dramatic change in clinical outcomes was the reduction of urinary tract infections, which was accredited to the removal of catheters within the first 24 hours as stated in the ICP. A primary concern associated with the reduction in health care cost is the potential for adverse effects on clinical outcomes. The interventions evaluated in this study resulted in a reduced cost and length of stay while maintaining functional status in the control group. However, there was also a reduction in patient satisfaction with quality of care in the ICP group. The telephone conversation one month later concluded that the experimental group stated a lower recovery rate than the control group. This, therefore, warrants further investigation and perhaps an increase in community support. It is unsupported as to whether the effects are reproducible and can be generalised to other conditions, and this therefore needs to be addressed in future studies. The research was supported by a grant from the federal Agency for Health care Policy and Research which did not have a vested interest in the outcome of the findings. However, reducing cost while maintaining standards of care has become an important policy goal of health care reform efforts.

Ghosh et al. (2001) undertook an American based study on patients undergoing a hysterectomy for either cervical or endometrial cancer. Specific ICPs were developed for the patient group. Data were collected on total direct costs and patient satisfaction for one year prior and 18 months after implementation of the ICP. Sixty three patients with cervical carcinoma and 21 patients with endometrial cancer were included in the preintervention group, and 42 and 25 patients were accrued using an ICP. Patient satisfaction did not demonstrate any change between the two groups, nor were there any higher rates of re-admission during the study period. The average length of stay was reduced from 5.2 (cervical carcinoma group) and 4.7 days (endometrial cancer group) to 3.4 days for both groups. Total direct costs were reduced by 29 and 32% respectively.

In 2000, De Luc undertook a quasi experimental study examining two groups of patients receiving either maternity or breast disease care in one NHS Trust in the UK. A comparison of clinical care delivered before (control group) and after (experimental group) the introduction of an ICP was undertaken. Two and five months data were collected prior to the introduction of the ICP on the maternity unit and breast care unit respectively. Data were obtained on patient satisfaction with care and staff views on the development and implementation of the ICPs. Both data sets were collected three months after the introduction of the ICPs. Patient satisfaction was collected using a specifically designed questionnaire containing a mixture of five point Likert scale questions. Unfortunately the reliability and validity of the questionnaire is not reported. The results were mixed. Interestingly with the breast disease patients a notable trend towards greater satisfaction was reported, compared with a lower overall trend to satisfaction in the maternity pathway group. Additional clinical changes to the care of breast disease patients included a reduction in visits to the hospital for diagnostic purposes, and a reduction in the days of reporting mammogram results (from 7.1 days to 1.7 days). In the maternity pathway there was a reduction in the number of antenatal and postnatal contacts. An overall reduction in contacts for the breast disease patients can be seen as a positive change, whereas for maternity patients this could be viewed as lack of support. These simple clinical changes could be the reason for differences in satisfaction. Unfortunately no details were given on the number of patients or staff data. The difference in satisfaction between the two groups is consistent with the finding from Ghosh et al. (2001).

A retrospective study involving 124 patients who underwent a laparascopically assisted vaginal hysterectomy was undertaken by Chang and Lin in 2003. Data were collected on 40 patients prior to the introduction of an ICP, and 84 using the ICP. There were similarities in age and no differences in disease or pelvic adhesions between the two groups. It is reported that the main purpose of introducing the ICP was to maintain or increase quality and to control cost. There was a reported reduction in length of stay from 6.9 days to 4.08 days (p=<0.01) for the ICP group. Additionally a decreased laboratory fee by 56.2% (p=<0.01) resulting in an overall fee decrease of 8.1% (p=<0.01) was concluded. Clearly there was an improvement in cost outcomes but unfortunately no data were included on patient opinion of care and therefore it is unclear how quality issues were demonstrated.

2.6.6. Medical ICPs

Johnson (1995) states that ICPs have worked in medical areas as a quality improvement tool at the Ashford Trust Hospital. Johnson says that individuals should not be opposed to having outcomes monitored as it proves that there is a commitment to providing a quality service. The quality assurance is performed by a variance analysis of the ICP on every 13th patient, giving valuable audit data to review, update and improve practices and procedures. In 1992, two pilot ICPs were successfully evaluated leading to an expanded programme. In 1995 more than 15 ICPs were used throughout the hospital allowing continuous clinical audit with the aim of improving clinical outcomes by analysis. Although the literature does not discuss the methods of the research conducted within the hospital Trust before the introduction of ICPs, it is evident that such a multidisciplinary approach to care is successful.

A report of a project to develop an ICP for spinal cord injury was published in 1996 (Fox and Anderson). The project took place at a 700 bed urban university medical centre located in Virginia, USA. The hospital specialised in traumatic brain and spinal cord injury. At the time of development no other ICP had been used to care for spinal cord injury, and no other ICP had been used within the hospital. Education was provided to all staff as the first stage of the development and implementation of the spinal cord ICP. The ICP was piloted for a six-month period and data were collected to evaluate its efficiency. Similar data were collected prior to the six-month pilot to allow comparison. Data were collected on length of stay and cost which resulted in a significant reduction of both in the ICP group. Unfortunately, no detail for data collection or analysis is given. It is documented, however, that length of stay in the Intensive Care Unit was decreased by 14 days and costs were dramatically reduced. The analysis of variance data was the second level of evaluation and occurred in the ICP group only. Pain management was noted as being an important variable in whether the patient progressed steadily toward their goals. These data were confirmed by clinicians who had agreed that pain management issues were a high priority of spinal cord patients. It is unclear how pain was assessed and managed prior to the ICP implementation and so it is uncertain whether it was the ICP that changed practice. During the evaluation phase, the nursing staff identified the need for a 'champion' for the ICP process. However, it is not clear how the nursing staff were engaged in the evaluation phase. Finally, Fox and Anderson (1996) conclude that the immeasurable benefits of going through the

ICP development process have had a more lasting impact on the overall quality of the spinal injury care. They believe that staff have increased their knowledge, improved their interdisciplinary approach to patient care and increased team cohesion. These data were collected through informal focus groups with the multidisciplinary team.

A randomised control trial study on the effectiveness of an ICP for in-patient asthma management was published by Johnson et al. (2000). Johnson et al. recognised the potential of ICPs in supporting practitioners to comply with national guidelines. However, Johnson et al. were not convinced of the overall effect ICPs had on patient outcomes. Patients between the ages of two and 18 years admitted with an asthma exacerbation and not under the care of an asthma specialist were eligible for the study. Patients were randomised either to a conventional ward (control group) or a ward using the ICP (intervention group). Data were collected on length of stay, use of nebuliser therapy and for use of acute care clinics or health care providers for two weeks after discharge. One hundred and ten patients were enrolled in the study accounting for 26% of the admissions. The control and intervention group were reported to have similar demographic and asthma severity profiles. The intervention group had an average of 13 hours shorter length of stay than the control group. In addition, at every dosing interval, the intervention group received less nebuliser therapy. There were no reported mortalities in either group. Unfortunately, no data were reported on whether there were any differences between the groups on support following discharge. It is, therefore, difficult to draw meaningful conclusion as the intervention group may have been discharged earlier but this may have had an impact on the support required following discharge.

Levelt et al. (2008) undertook a national telephone survey to establish how many coronary care units had developed and were using ICPs for acute coronary syndrome. The results concluded that only 40% of English and Welsh hospitals were using ICPs in their coronary care units for acute coronary syndrome. Additionally Levelt et al collected information from their locally developed ICP to determine whether there was an improvement in door to needle time for thrombolysis or to rates of discharge medication with aspirin, beta blockers or statins. The myocardial infarction national audit programme was used as the baseline data for comparison purposes. No difference was seen for either aspect of care. Unfortunately the number of patients is not reported so it is difficult to know whether the sample size was appropriate and therefore the results are of limited value.

Hadjistavropoulos et al. (2008) present a study of the providers perception of implementing ICPs for patients with chronic heart disease. The multidisciplinary team provided feedback on their experiences concluding that communication, knowledge and patient involvement all improved; but there were challenges around documentation, timeliness of care deliveries and ownership. The article does not explain the implementation of the ICP in any detail and no information is given regarding the data collection instrument. Therefore, although the article is helpful in the areas it highlights the information gained can not be transferred to other settings without further considerations.

An emerging area of development in the literature is the use of ICPs in the accident and emergency department. Ologos-Claw et al (2009) discuss the development and implementation of an asthma ICP in five hospitals throughout Ontario. The research focuses on the staff opinion of the development and subsequent introduction of the ICP in relation to barriers and benefits. The ICP was piloted for 6 months with educational support to all staff given prior to pilot. Questionnaires were sent to 338 members of staff with 207 being returned. There is no discussion of the questionnaire administered and therefore reliability and reliability is questionable. However, the authors do go on to describe that staff focus groups were convened to explore issues further. The results support an improvement in adherence to guidelines, an increase in the knowledge of best practice and a reduction in variation of care. Ologos-Claw et al conclude that the barriers are being used to refine a new version, but unfortunately the barriers are not presented.

2.6.7. Stroke ICPs

Hydo (1995) used variance analysis to evaluate an ICP for stroke patients. Initially two major problems were highlighted, firstly, selecting appropriate patients using diagnosis alone and, secondly, determining how to advance the patient along the ICP, as decisions were often complicated by variation in the patient's physical condition. Thirty completed ICPs were reviewed highlighting several problems. The time to complete diagnostic tests varied, along with physicians' standing orders and the scheduling of therapists e.g. physiotherapists, speech and language therapists. The problems resulted in an increased length of stay. The evaluation served to change practice in two ways. Firstly, all patients would be assessed by a speech therapist to establish swallowing and thereby give an indication of the severity of the stroke and, secondly, a dedicated stroke unit would be established to ensure patients were at the right place, with the appropriate people to treat them.

Scott and Cowen (1997) described the implementation of a stroke ICP into a stroke rehabilitation unit at a hospital in the UK. The rationale for changing care delivery was through anecdotal evidence from staff suggesting that existing care plans were neither sufficiently explicit nor specific to the needs of patients on the unit. An audit of the clinical record and a nursing staff questionnaire confirmed their concerns. Combined the audit and questionnaire highlighted three categories of problem: an absence of explicit patient care plans, poor documentation of patients' progress on the unit and a lack of communication between members of the team. An ICP was developed and introduced to the unit through a team approach. A staff questionnaire collected opinion of the new ICP. The reported benefits included an accurate and user friendly care planning system, regular review of professional practice, barriers between the professionals were reduced if not removed, their was multidisciplinary ownership of the patient records and improved communication. Although this paper is mostly anecdotal and qualitative it does support the suggestion that ICPs have been developed in the UK to improve quality primarily and not contain cost.

In 2002, Sulch et al. published a study on whether an ICP improved processes of care in stroke rehabilitation. Acute stroke patients undergoing rehabilitation were randomised to receive ICP managed care or conventional multidisciplinary care. Data collection occurred over a period of six months. A total of 152 patients were enrolled in the study providing 80% power to detect changes in care. There was no cross contamination of staff between wards. Validated stroke audit tools were used to compare data between the two groups. The ICP group were associated with higher frequency of stroke specific assessments. Documentation of provision of certain information to patients/ carers and early discharge notification to General Practitioners were also more common in the ICP group. No significant differences were seen in length of stay or the processes of interdisciplinary co-ordination and patient management between the ICP and control group.

Kwan and Sanderson published a systematic review of stroke ICPs in 2004. The review only considered randomised controlled trials and non-randomised studies that compared ICPs with standard medical care, resulting in three randomised control trials (340 patients) and 12 non-randomised control trials (4081 patients). No significant differences were found between the ICP and control group in terms of death or discharge. The results, stated as significant, suggested that patients managed with an ICP were more independent at discharge, less likely to be re-admitted, less likely to suffer a urinary tract infection and more likely to have neuro-imaging. However, patient satisfaction was significantly lower in the ICP group. Kwan and Sanderson (2004) concluded that the use of stroke ICPs may be associated with positive and negative effects. However, most of the results were derived from non-randomised studies and, therefore, likely to be influenced by potential biases and confounding factors. It is difficult therefore to draw sufficient evidence to justify the routine implementation of ICPs for stroke patients or indeed transfer the findings to other specialities. However, worthy of noting is the reduction in patient satisfaction in the ICP group. Kwan and Sanderson did not provide any transcription from the original research or draw any conclusions for the reduction in patient satisfaction in the ICP group.

Tuqiri and Eriksson (2008) described the introduction of an ICP into stroke care as a mechanism to improve practice from presentation in the emergency department. Although the article is interesting as it stipulates that practice improves (the opposite of what is seen by other authors in the area of stroke) the evidence is anecdotal as it only gives the opinion of the authors.

2.6.8. End of life ICPs

There has been growing interest in the development of ICPs for end of life care. The end of life ICP is a multidisciplinary document that provides an evidence-based framework for the dying phase, providing guidance on the different aspects of care required e.g. comfort measures, discontinuing of inappropriate interventions, prescribing of anticipatory medication. Ellershaw and Murphy (2005) highlight that one of the greatest challenges facing palliative care is to transfer the end of life model that has been developed in the hospice sector into the mainstream NHS. It is here that the similarities with all other ICP developments are seen, that, to influence the culture of care, the aims of health care and clinical teams must be recognised. The multidisciplinary team and wider support systems need to embrace new ways of working. Jack et al. (2003) describe a study to explore nurse's perceptions of the impact of an end of life ICP in an acute setting. A purposive sample of nursing staff who had an understanding and practical experience of the ICP were chosen. Data were collected through focus groups. Data were analysed through a four-stage model of organisation, familiarisation, reduction and analysis. The results suggest that nurses found that the ICP had a positive impact on patients, their families and also on nurses and medical staff. However, the study was a small-scale qualitative study and therefore generalisability of the results is not appropriate. It is useful to see that an end of life ICP was positively evaluated in an acute setting. In 2005 Bookbinder et al. published a study on outcome of an end of life ICP introduced on three hospital units as part of a quality improvement initiative. The outcomes were compared to two general medical units receiving usual care. The ICP patients were more likely to have 'Do not resuscitate' orders than the comparison units, whereas, the comparison units were more likely to use morphine infusions and cardiopulmonary resuscitation.

Bookbinder et al. (2005) concluded that end of life ICP promotes aggressive symptom assessment and treatment.

Dudgeon et al. (2008) published a study that reviewed the effectiveness of an ICP specifically around symptom management and caregiver satisfaction. Two separate cohorts of patients (from different clinical areas) were included and data were collected pre and post introduction of the ICP. Edmonton symptom assessment scale, caregivers' reaction assessment FAMOIRE scale and charts/ documentation were used to collect the data. The results supported previous findings in relation to an improvement in the documentation of symptom management e.g. pain documentation increased from 24.5% to 74.6%. However, no change was seen in the intensity of symptoms (p=0.59), on the burden on caregivers (p=0.09) or the satisfaction with caregivers (p=0.94). Although group size was not reported it was stated that the sample size was appropriate for the statistical tests.

Day (2009) describes a neurological end of life ICP developed for a specific unit. The ICP was piloted for six months and evaluated through staff opinion via a questionnaire. The results were positive in that the staff felt the ICP improved communications. There is no information about the questionnaire regarding its validity or reliability.

2.7. Summary of research methodologies

Following an extensive review of the studies surrounding ICPs it is worth reflecting on the different methodologies used. There does not appear to be any significant differences in methodology between studies originating in the UK to that of other countries. A number of authors reporting ICP developments tended to describe organisational issues including documentation dilemmas and the importance of educating all clinical staff involved in using the ICP (Douglas, 2002; Ellershaw and Murphy, 2005; Miller et al, 1995; Morgan, 1993; Wigfield and Boon, 1996). However, there was limited, and on occasions no methodological discussion on which to justify conclusions and recommendations making it impossible to transfer to other clinical settings. Variance analysis and audit were referred to as being used to validate the effectiveness of ICP implementation within a health care organisation (Bookbinder et al, 2005; Johnson, 1995; Miller et al, 1995; Scott and Cowen, 1997). Again, due to the limited discussions surrounding the studies methodologies it was not possible to draw meaningful conclusions. Two authors concentrated on the opinions of the staff to determine the usefulness of ICPs in clinical practice (Jack et al, 2003; Scott et al, 1997). Jack undertook semi structured interviews with staff, whereas Scott used questionnaires. Unfortunately no details regarding the design, validity or reliability of the staff questionnaire is given. Both studies provide an insight into the potential benefits ICPs can offer staff, but unfortunately did not include patient experience. The authors that did cover patient experience tended to include it as patient satisfaction where it formed one of several outcome measures (Becker et al, 1997; Blegan et al, 1995; De Luc, 2000; Ghosh et al, 2001; Joseph et al, 1997; Kwan and Sanderson, 2004). Unfortunately, a description of the patient satisfaction measure is not provided with the exception of Becker et al (1997) who used a three-question follow up survey (telephone, mail or at a follow up appointment in the hospital unit). Interestingly, there are clear differences with the level of patient satisfaction between surgical and medical ICP cohorts. Surgical patients tend to be more satisfied with the care received with an ICP compared to traditional methods (Becker et al, 1997; De Luc; Ghosh et al, 2001; Joseph et al, 1997) where as medical patients tend to be less satisfied (De Luc, 2000; Kwan and Sanderson, 2004).

The most frequently reported outcomes were associated with cost e.g. length of stay and complications. Most authors reported benefits from the introduction of ICPs through a reduction in length of stay (Becker et al, 1997; Blegan et al, 1995; Chang and Lin, 2003; Cohen, 1991; Dowsey et al, 1999; Fox and Anderson, 1993; Ghosh et al, 2001; Harris, 1993; Hwang et al, 2000; Johnson et al, 2000; Mabrey et al, 1997; Muluk et al, 1997), a reduction or no differences seen in complications (Becker et al, 197; Harris, 1993; Hwang et al, 2000; Joseph et al, 1997). Again the introduction of a stroke ICP led to decreased benefits resulting in an increase in length of stay (Hydo, 1995; Sulch et al, 2002). The benefits of ICPs remain focused in surgical or the very least predictive admissions with no clear benefits highlighted in the area of stroke care. Interestingly, the development of ICPs in end of life care is of growing interest and authors have started to disseminate findings in relation to this.

A review of the different methodologies highlighted that a retrospective cohort approach was the most frequently used i.e. a pre and post test on the same ward (Becker et al, 1997; Chang and Lin, 2003; De Luc, 2000; Fox and Anderson, 1996; Ghosh et al, 2001; Harris, 1993; Hwang et al, 2000; Mabrey et al, 1997; Muluk et al, 1997; Santamaria et al, 2003). Understandably, the before and after design is easily achievable in clinical practice as only one unit needs to be involved in a study, however this approach is susceptible to confounding historical effects whereby circumstances (staff, policies, practices) can change in the ward leading to observed differences (Polit and Hungler, 1997).

Only a few of studies (Blegan et al, 1995; Cohen, 1991; Dowsey et al, 1999; Johnson et al, 2000) used an experimental design. Blegan et al (1995) and Cohen (1991) study population are caesarean section patients with many comparables to the current one (abdominal surgery). Blegan et al (1995) included length of stay, cost, patient satisfaction and physical recovery as outcome measures. As well as including length of stay and cost Cohen (1991) also included complications and the time nurses spent on direct patient care. Dowsey et al's (1999) paper only provides details on the overall research methodology (i.e. randomised, unblinded) therefore making critique impossible. Johnson et al (2000) report on a randomised control trial for asthma ICPs. Length of stay and the use of nebuliser therapy are reported as reduced. Sample size appears adequate although there is no account of this.

The work to date in the UK has had small sample sizes, which have not been tested for statistical significance. On the whole sample sizes were inadequately described throughout the literature meaning power calculations were rarely reported with the exception of Blegan et al (1995) and Sulch et al (2002). Unfortunately many studies did not report any sample size making the findings and recommendations inappropriate for generalising. Additionally, a couple of the papers did not even report the study's methodology meaning the studies findings were impossible to interpret and therefore use (Alder et al, 1995; Joseph et al, 1997).

Overall, there was little experimental research that included both quality aspects of care and cost issues. The majority of research was descriptive and anecdotal, and impossible to generalise. The literature identified a large gap in the knowledge based on ICPs specifically in relation to experimental designs with adequate sample sizes. The review of current research methodologies surrounding ICPs was used to support the development of the specific research aims, questions and methodological design for this study and is explored in detail in the methods chapter.

2.8. Outcomes

Before considering the research design it is important to determine the outcomes to include for measurement. The Research on ICPs to date has focused on a variety of outcomes. It is suggested that the outcomes fall into three broad categories; patient, provider and health care system outcomes. The next section of this chapter will review each outcome category in relation to the current thinking and evidence.

2.8.1. Patients

Bond and Thomas (1991) explored the issues of measuring outcomes of nursing care. Although this paper is descriptive it provides an important aspect of ICPs and one that needs to be addressed. Patient outcomes are a fundamental aspect of the purported benefits of ICPs. It is, therefore, imperative to find accurate, reliable and valid mechanisms to capture different outcomes. The methodological and professional issues raised in the article suggest ways of moving forward in measuring outcomes of nursing care. Nurses are increasingly being asked to demonstrate the value of nursing practice in terms of its effects on patients. Beardshaw and Robinson (1990, cited in Bond and Thomas, 1991) state that value for money is a major motivating force in the NHS. In 1988-9 nursing and midwifery accounted for 3% of total public spending (Kings fund project cited in Bond and Thomas, 1991). The need has now emerged to identify the specific nursing component of care and develop a body of knowledge unique to nursing. This care must then demonstrate that nursing input results in beneficial outcomes for the patient. Patient outcomes are an immensely complex phenomena and several attempts have been made to classify types of outcomes. The article concludes that there is unlikely to be any harm caused to patients by a professional ideology urging quality assurance initiatives, and in this the importance of outcome measurement is unquestioned.

A critical concern associated with the issue of case management is that decreased resources will reduce quality of care (Carey et al., 1990; Goldfarb et al., 1991; Hillman et al. 1991; Ware et al., 1986; all cited in Blegan et al., 1995). The importance in relation to ICPs is that quality aspects of patient care must clearly be defined with appropriate methods of measurement.

Zander (1990) highlights those clinical systems which structure the care giving process at patient level will achieve cost effective, quality outcomes. It is acknowledged by Zander that the ICPs appear to go against the grain of individualised care to being task centred. However, Zander argues that by stating what is expected, variance actually encourage improved individual care through increased attention being paid to the variance and thereby making it patient centred. Zander further states that these variances are to be expected, as ICPs are recognised to only be appropriate for about 75% of the population. It is, however, unclear how this percentage of the population is reached. Zander suggests that mini care maps can be introduced for a variety of variances e.g. urinary tract infections, deep vein thrombosis, chest infection etc. The article also highlights that when developing ICPs, flexibility should be built into them e.g. one patient will want to mobilise perhaps a whole day earlier than the next, yet they would both be suitable patients for using an ICP. This article is all anecdotal giving no reference to research findings to suggest that ICPs are a useful tool. However, it does give the impression that not every patient will and must fit onto an ICP, and there remains room for alternative patient care e.g. variances should be expected.

Redfern and Norman (1990) argue that a preoccupation with cost effectiveness threatens to swamp concerns of quality of care. The article considers different approaches to the measurement of quality aspects of nursing care. Redfern and Norman (1990) recognise that resource management now makes it possible to charge for each item of a patient's stay, which in turn allows a total cost to be put on every patient for his or her stay in hospital. However, it is argued that quantitative measures give no indication of the quality of care. Measuring the quality of care is the subject of many publications in nursing journals but some suffer from confusion between the different concepts involved. Clinical nurses wishing to evaluate the quality of their care have the choice of selecting off the shelf measures. It is, therefore, important to point out that a method of quality measurement needs to be appropriate and documented.

2.8.2. Providers

The benefits of using ICPs have been identified as enhanced collaboration and communication, greater continuity of care, streamlining of documentation, more effective teamwork, greater understanding of other professionals roles, and clarification of individual responsibilities (Heymann, 1994; Johnson, 1994; Layton, 1993; McKie, 1997; Moody, 1995; Morris and Mylotte, 1995; Petryshen and Petryshen, 1992; Stevens, 1997). Other professional groups and, indeed, specific authors believe that the impetus of managed care is a focus on the delivery of quality patient centred care (Ebener et al., 1996). However there remains a lack of empirical evidence to substantiate these claims. Miller et al. (1995) confirmed that ICPs contribute to standardising practices, highlighted the value to students at being able to follow a standard level of interventions that reflect best practice for patients with similar conditions.

Nurses are viewed as the major influences in ICP initiatives as they are seen as the best placed profession to co-ordinate and facilitate development, implementation and evaluation (Moody, 1995). The work initiated by Zander (1988) was very much nurse-led and focused ICP development on nurses. However, concerns have been raised about the concept and underlying principles of managed care. There is a concern that ICPs are actually detrimental to the nursing profession as ICPs can be seen to limit professional autonomy and clinical judgement, and reduce clinical practice to a set of prescribed activities (Beyea, 1996). This argument can hold true for all professional groups including medical staff, as ICPs have been seen as restricting choice for individual doctors, modifying clinical practice through the introduction of guidelines, and transferring specialist services to selected areas (Tingle, 1997b). Indeed it is documented that doctors working in the USA have found themselves subject to gagging clauses which effectively prevent them from telling patients about the limitations of their managed care plans (Editor, The Lancet, 1996). However, the counter arguments are that managed care prevents over treatment and reduces spiralling costs that have resulted in variable practice patterns across the providers.

A decade ago nurses in the USA were faced with several problems that Laxade and Hale (1995) believe are now affecting nurses in the UK. These are suggested as the inflexibility of existing documentation, multidisciplinary collaboration becoming exceedingly difficult, advancement in knowledge limited by current tools and evidence that most patients, although individual have a standard set of problems. Laxade and Hale (1995) discuss the importance of finding a way of delivering un-segmented, quality care with the emphasis on containing cost.

Moloney and Maggs (1999) undertook a systematic review between the years of 1987 to 1997 of the relationship between written manual nursing care planning, record keeping and patient outcomes with the intention of testing the hypothesis that care planning and or record keeping in nursing practice had no measurable effect on patient outcomes. The researchers concluded that, from a potential 300 abstracts, no study was sufficiently robust to be included in the review. The consequences of this for nursing practice, management and research are significant. Considerable attention to nursing interventions and patient outcomes needs addressing. Substantial amounts of money have been invested in education and training of nursing care planning and record keeping. The review also suggests that we do not know if a relationship exists between written nursing care and patient outcomes. Therefore, a robust research study should be carried out to evaluate the relationship between care planning and patient outcomes. Moloney and Maggs (1999) suggest that challenging what outcomes would be worth measuring needs to be clarified. Patient and staff satisfaction, morbidity, mortality, quality of life indicator, length of stay and acuity on discharge are suggested as useful measures. Additionally an economic evaluation should also be part of any future study.

Overall, there has been little research on measuring patient satisfaction as a result of introducing ICPs. The work to date in the UK has been small sample sizes which have not been tested for statistical significance.

2.8.3. Health care systems

Alder et al. (1995) recognises that within the health care system hospitals have had to struggle with dwindling resources. Streamlining patient care is an effort to improve quality and reduce cost. It is suggested that the nursing profession has taken a proactive approach in redesigning the role and scope of the registered nurse. Morgan (1993) recognised that the delivery of care had to change in the NHS following a shift to market focus, and increased awareness of quality and choice. Most health care organisations have used length of stay (LOS) indicators to determine whether costs have been reduced with the introduction of ICPs (Ayestas et al., 1999; Clare et al., 1995; Clark et al., 1994; Coffey et al., 1992; Comried, 1996; George and Large, 1995; Grant et al., 1995; Hydo, 1995; Kowel and Delaney, 1996; Rudisill et al., 1994). However, there was limited data collected on quality aspects of patient care included in these studies.

More recently quality indicators for patient care have become a high priority for the department of health cumulating with several publications by Lord Darzi. The final report on the NHS next stage review *High quality care for all* (2008) defines quality of care as clinically effective, personal and safe; effectiveness of care from the clinical procedure to the quality of life after treatment. There is a great emphasis on the patients entire experience bringing clarify to quality and supporting clinicians to measure quality to support improvements. Primary care purchasers have commenced embedding the new principles of quality in locally agreed frameworks resulting in financial rewards and penalties for providers who fail or succeed with key indicators e.g. end of life care. Specifically the local indicator in relation to end of life care is the successful implementation of an end of life care pathway.

Clarke et al. (1996) undertook a study to determine whether a shorter stay in hospital affected patient outcome and the cost to the hospital. The study concluded that a shorter stay following a hysterectomy was associated with benefits of a lower risk of wound infection in the first 10 days (p=0.03; odds ratio 0.44), no deterioration in physical mobility after six weeks, no constipation at six weeks (p=0.001) and no moderate or severe urinary symptoms (p=0.004). A multivariate analysis indicated that the only outcome to remain significantly associated with length of stay was improved physical mobility after six weeks (p=0.02). The reduced length of stay resulted in an actual cost saving of £251 per person and patients felt that their length of stay was appropriate in 73% of the cases.

2.9. Variables

Researchers have examined a variety of outcomes associated with ICPs. However, there are some similarities and common themes, although data were collected and analysed using different methodological approaches. Some authors concentrated on staff opinion (Moloney and Maggs, 1999; Scott and Cowen, 1997). Whereas others focused mainly on patient variables, including improvements in satisfaction (Blegan et al., 1995; Currie and Harvey, 1999; Dowsey et al., 1999; Wigfield and Boon, 1996), reduced complications (Cohen, 1991; Mabrey et al., 1997; Harris, 1993), maintenance of re-admission rates (Mabrey et al., 1997) and reduced length of stay (Blegan et al., 1995; Clarke et al., 1996; Cohen, 1991; Dowsey et al., 1999; Fox and Anderson, 1996; Hwang et al., 2000; Johnson et al., 2000; Mabrey et al., 1997; Muluk et al., 1997). Additionally, some studies have selected cost as an outcome measure (Blegan et al., 1995; Cohen, 1991; Fox and Anderson, 1996; Hwang et al., 2000; Muluk et al., 1997; Mabrey et al., 1997). Interestingly, length of stay was used as a proxy for cost (as an increased length of stay has a direct effect on overall cost, Alder et al., 1995). Finally, one article concluded that the developmental process of producing the ICP for practice was the main benefit to patient care (Fox and Anderson, 1996).

2.10. Conclusion

With a growing emphasis on identifying and containing cost of health care whilst maintaining quality of care, there is a need to identify a new approach to patient care delivery. The concern raised in the USA over the lack of systematic empirical researched evidence surrounding ICPs is echoed in the UK literature. ICPs appear to have been embraced in the UK by several health care organisations without any real sense of whether they do what they are claimed to do. There is some evidence of evaluation but this even tends to be methodologically weak and focuses on variance analysis. Additionally, there is a real absence of partnerships with patients in ICPs and managed care initiatives. With no consensus regarding the perception, definition and measurement of quality and patient outcomes the research that has been carried out so far is inappropriate for transfer to other clinical areas directly. Although the majority of the articles do recommend the introduction of ICPs as a means of coping with the increased demand and decreased resources within the NHS it is also recognised that ICPs are not without problems. The reliance on anecdotal and opinion-based evidence can bias decisions about the value of ICPs. While the literature does highlight some of the work undertaken during the implementation of the ICPs, the major emphasis has been on personal opinion rather than systematic empirical research. There is no collective evidence on patient, provider and health care system outcomes. Indeed many authors (Ebener et al., 1996; Kowel and Delaney, 1996; Reinhart, 1995) recognise the need for further research into ICPs. There remains minimal empirical research on the subject of ICPs, creating great difficulties in drawing meaningful conclusions. It is disappointing to conclude that there have been very few studies which have reported their methodology in enough detail to allow rigorous critical appraisal. The majority of evidence-based findings are to be found in non-nursing text highlighting the importance of nursing to find its own professional body of knowledge in relation to ICPs.

This chapter provided an overview of the relevant literature surrounding ICPs in the attempt to gain a more detailed understanding of their origins, where they are being used and why. The literature review was presented under the emerging themes. Firstly an overview of managed care, case management and ICPs was offered followed by an overview of the development within the USA and Australia, preceded by the United Kingdom. A review of the current use of ICPs and associated evaluation material was also given. Finally, outcomes associated at the patient, provider and health care system level were discussed. In conclusion, there is no doubt that the experience of professionals documented in the literature highlights that there are benefits in using ICPs to deliver patient care. However, within the same literature there are also a number of barriers identified that need careful consideration. Overall, there is a lack of empirical research into ICPs which makes it is impossible to determine what effect ICPs have on patient, provider and health care system outcomes. The work to date has had small sample sizes, which have not been tested for statistical significance. The gap in the knowledge base in terms of the relationship between research and practice is vast, with most of the literature being practice based observations. Interestingly there is a significant lack of research that examines a combination of patient, provider and health care system outcomes in relation to ICPs. Additionally, the relationship between quality aspects of patient care whilst containing costs has also been given little attention. There remains, for the foreseeable future, continuing pressure to contain cost whilst maintaining quality patient care, and ICPs appear to be the mechanism being embraced to achieve this. There is a need, therefore, to undertake research on ICPs that captures outcome at patient, provider and health care system level. It is the intention of this research study to address the fundamental quality and cost containing requirements of the new NHS whilst reviewing the effect an ICP has on outcomes at the patient, provider and health care system level.

3. Chapter Three: Methods

3.1. Introduction

In Chapter two the theoretical and methodological literature surrounding ICPs was reviewed. The chapter highlighted a gap in the knowledge around ICP usage in the NHS and demonstrated the need for research on ICP evaluation in relation to quality and cost.

This chapter focuses on the research methods. Firstly a discussion on the theoretical framework that guided the study is discussed. This is followed by an overview of the research problem and research purpose. An appraisal of the research options is then given highlighting the research design employed to answer the three specific questions. Hypotheses developed to test the research questions are presented and variables associated with each hypothesis are conceptually and operationally defined. Threats to internal validity and methods used to control identified threats are discussed. A description of the study setting and sample, including size and recruitment criteria follows. Recruitment of research subjects including ethical considerations is described. The data collection methods for the three research questions are presented followed by a description of the statistical analysis procedures that were used.

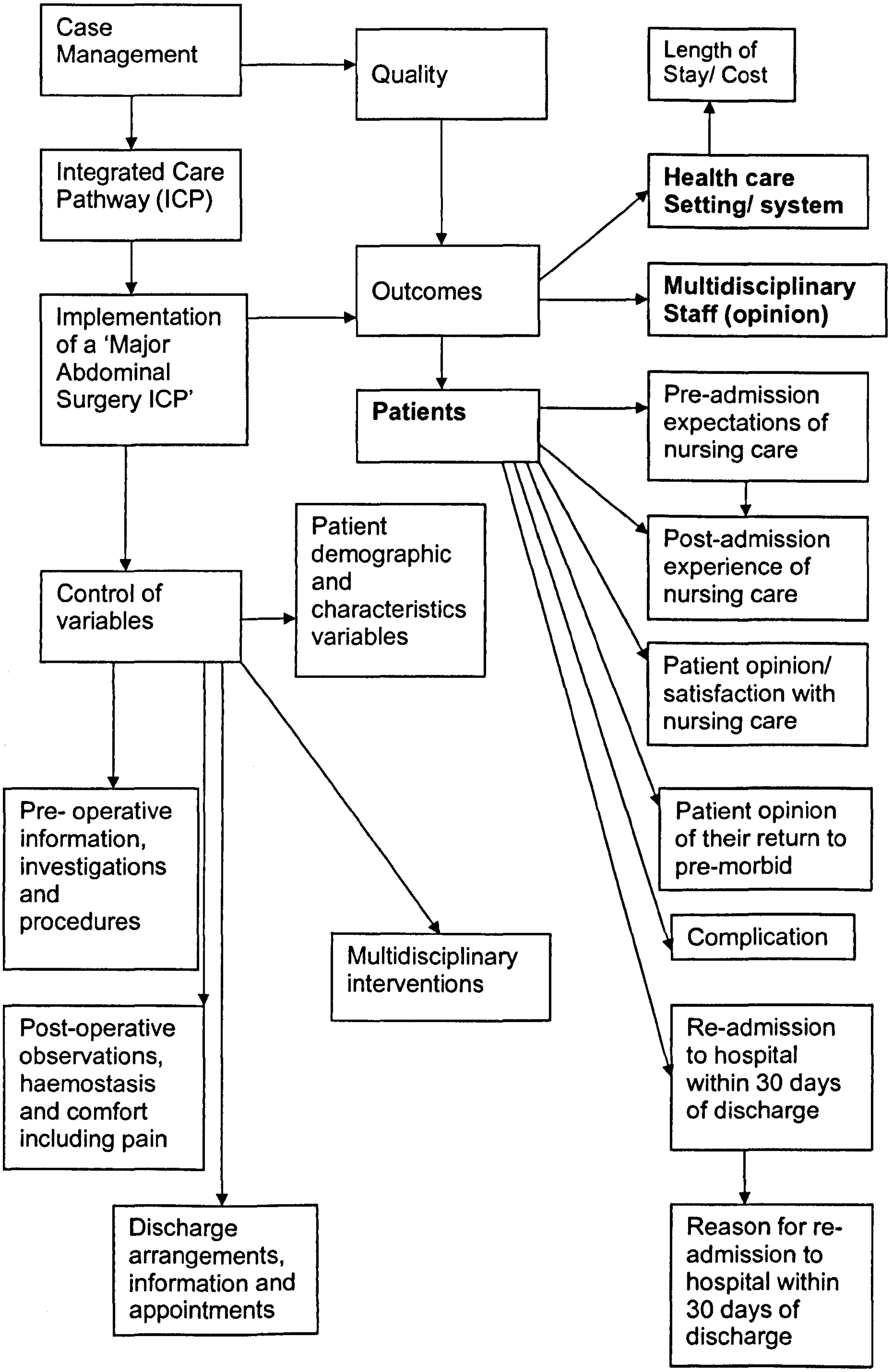
3.2. Theoretical development of the study

The term theory is used in many ways, even within research (Polit and Hungler, 1997). The overall purpose of theory is to make research meaningful and interpretable. Theories allow researchers to knit together observations and facts in an orderly system. A theory may be defined as a system of ideas or statements that may be held as an explanation or account of a group of facts or phenomena (Michie and Abraham, 2004). There is minimal experimental research on the subject of ICPs specifically within the field of gynaecology thus creating great difficulties in drawing any meaningful conclusions. The reliance on anecdotal and opinion-based evidence can bias the decision of the value of ICPs. While the literature does highlight some of the work undertaken during the implementation of the ICPs, the major emphasis has been on opinion base rather than systematic empirical research.

Concepts are the basic ingredients of a theory (Burns and Grove, 2005). Theories also consist of a set of statements or propositions, each of which indicates a relationship. The first step in relating the current research study to a theory is through identification of the variables of interest. The literature review clearly identified major concepts (variables) that form part of ICP development, implementation and evaluation. However, until now the variables have formed part of other researchers' studies and been examined in the light of different theoretical models and research design. There has also been a lack of experimental designs and robust sample sizes to generate statistically significant results.

A conceptual map (Figure 1) was developed to demonstrate that some variables may be interrelated and contribute, or partially contribute, directly or indirectly to one another. It is anticipated that, by being able to gain a greater understanding of how the variables relate, specifically in relation to an ICP, multidisciplinary practice and development can ultimately be guided. The variables are explored in detail later in the chapter, but it is theorised that the outcomes are either at patient, staff or health care organisation level.

Figure 1: Conceptual Map



Quality is at the heart of the conceptual map (Figure 1) as ICPs lead to an improvement in outcomes. The literature supports this thinking, in that the whole of ICP development, implementation and evaluation is around maintaining and improving patient care, sometimes described as quality assurance. Higher patient acuity (i.e. the more acutely ill), cost cutting measures, an increase in litigation, and increased expectation by an educated generation of health care consumers has had an impact on the health care environment (Clarke, 2002). This has led to the need to continually measure, assess, and improve quality (Donabedian, 2003). Quality improvement requires a collaborative approach to succeed, and the need to build a cohesive and effective multidisciplinary team. Previously, professions would assess performance individually, however, today those disciplines must collaborate as a team in measuring outcomes and improving organisational performance. This collaborative approach is supported by quality management theory (Sierchio, 2003).

Donabedian (2003) highlights that some believe that quality in health care is too abstract and nebulous a concept to be precisely defined or objectively measured. He states that the concept of quality can be precisely defined, and it is amenable to measurements accurate enough to be used as a basis of assurance. The literature reflects the difficulties encountered by researchers and clinicians in agreeing what appropriate indicators of good and bad outcomes are, disentangling the results of health care interventions from confounding effects of other variables, and demonstrating relationships between measures of the process of care and measures related to outcomes (Ellis and Whittington, 1993). Donabedian (1980) offers structure, process and outcome as approaches to the acquisition of information about the presence or absence of the attributes that constitute or define quality. Structure denotes the attributes of the setting in which the care occurs including material resources such as facilities, equipment; human resources such as the number and qualifications of personnel; and of organisational resource such as methods of reimbursement. Process donates what is actually done in giving and receiving care including the patient activities in seeking care and carrying it out. And finally outcome denotes the effects of care on the health status of patients.

Improvements in the patients' knowledge and changes in the patient's behaviour are included under the broad definition of health status, as is the degree of patient satisfaction. This three-part approach is possible because good structure increases the likelihood of good process, and good process increases the likelihood of good outcome. However, there must be pre-existing knowledge between structure and process and process and outcome before assessment can be undertaken (Donabedian, 1988). Table 3 provides a matrix using the Donabedian model of structure, process and outcome for assessing the impact of an ICP.

Table 3: A matrix for assessing the impact of ICPs using the Donabedian model

Attributes that define or constitute an ICP	**Structure**	**Process**	**Outcome**
Multidisciplinary team work	Adherence to professionally defined criteria and standards of care Range and scope of services	Political pressures Presence of quality monitoring mechanisms Adherence to professional agreed norms of good practice Manner in which MDT deal with patients Number of people involved in care and when explicit	Satisfaction with structure/ process (ICP)
Explicit patient journey	Use of service relative to need Attachment to a particular team Availability of adequate time for staff to spend with patients Central, coordination to care Follow up clear	Patient expectation Understanding process Timeliness in seeking care Adherence to regime	Patient satisfaction Equalisation of health status among groups Health effects of early discharge from hospital Staff satisfaction with process (ability to 'work up')
Control of variables	Waiting time for appointments Population characteristics Clear governance mechanisms	Numbers, types and qualifications of staff	Mortality by client group Disease specific mortality Fatality by provider Patient survey Complications
Economic	Equality of funding Reduction in length of stay Size of facilities relative to function	Methods of payment Evidence of additional investigations, treatments	Cost of achieving specified improvements in health Re-admission rates

The challenge in this research study is not only to evaluate how an ICP influences quality but also how care delivered using an ICP affects clients, providers and setting outcomes. Even when universal access to care is available, it is essential to evaluate how that care affects outcomes. A systems model based on the work of Donabedian developed by Holzemer (1994) provides the solution. It is the intention that the model has the potential to explain the complex nature of health related outcomes. The model has two axes, the horizontal axis is a systems axis of structure, process and outcome, and the vertical axis consisting of three components; the client, the provider and the setting. Table 4 provides an overview of the Holzemer model.

Table 4: Overview of the Holzemer model

	Structure	Process	Outcome
Client	Clients have sought access to care because of a health problem. Each client brings complex structures e.g. family support, emotional resources	During the delivery of care, clients use many processes in addition to the care process to move towards health and healing e.g. expectation, educational level	Individual client outcomes might include indicators of functional status, quality of life measures, satisfaction with the service
Provider	The training and experience of the providers may influence client outcomes. It is important to understand providers experiences, attitudes and knowledge	This refers to all types of delivery systems, interventions or treatments that are delivered by providers e.g. clinical care guidelines	Provider satisfaction. Additionally, there may be provider outcomes about which the nurse is knowledgeable and could assist in the development of measures of those outcomes
Setting	This includes values, attitudes and beliefs, as well as available resources including financial, equipment, organisation/ delivery of care	Variables such as staff mix, patient acuity	Measuring settings/ outcome variables such as morbidity, mortality, readmission rates

Holzemer (1994) uses the term client (as opposed to patient) to reflect that the individual is part of a wider family and community. The broader term provider is used to reflect that health care delivery is a team approach. The setting is used to describe the available resources. Holzemer highlights that costs are a significant component of outcomes. Outcomes research is conceptualised to be the interaction and linkage between the vertical axis of client, provider and setting with the horizontal axis of structure, process and outcome. The model provides a useful tool for considering the overall concepts, how they interact, and the impact of an ICP on specific outcomes in the speciality setting. The model links structure with the process of activity and then with outcomes or changes in client status. It is worth noting that Holzemer developed the model for healthcare in the USA and therefore the focus was on cost containment. To use the model for the current study it is necessary to further consider what needs to be included within the specific sections. Table 5 provides an overview of prompt questions for structure, process and outcome at client, provider and setting level.

Table 5: Questions to be considered when using Holzemer's model

Structures	
Client:	What client characteristics are related to health outcomes?
Provider:	What types of providers are effective in ICP delivery settings?
Setting:	What are the important components of settings that may affect outcomes?
Processes	
Client:	What health behaviours of the client are operating that may support or hinder outcomes?
Provider:	What interventions or activities are effective in changing client outcomes?
Setting:	What changes are ongoing within a setting that might affect client outcomes?
Outcomes	
Client:	What are important self defined outcomes that are sensitive to nursing intervention?
Provider:	What are the outcomes (such as satisfaction) for providers who work in a particular setting?
Setting:	How is a setting different after operating within an ICP framework?

Using Holzemer's model and prompt questions it becomes clear that the study's concepts fit within structure, process and outcome. Table 6 provides an overview of the theoretical model using Holzemer framework.

Table 6: Theoretical model for study

	Structure	Process	Outcome
Client	Family support Age Social status Morbidity status	Educational level Expectation of nursing care	Functional status, quality of life measure, satisfaction with nursing care
Provider	Staff knowledge base Staff experience	ICP Traditional methods of care delivery	Staff satisfaction of ICP
Setting	Policies, procedures, guidelines Equipment Financial resources	Staff mix Staff levels Patient acuity	Length of stay Readmission rates

According to Donabedian (1980), the basic characteristics of structure are that it is relatively stable, that it functions to produce care or is a feature of the environment of care, and that it influences the kind of care that is provided. As a means of measuring quality of care, structure is rather a blunt instrument, as it can only indicate general tendencies. As a source of accurate current information on quality, the assessment of structure is of a good deal less importance than the assessment of process or outcome. Outcome means a change in the patient's current and future health status that is attributed to antecedent health care. Health care providers have recognised that the attitudes and behaviours of health care personnel play a key role in a patient's evaluation of health care quality (Kemppainen et al, 1999). The quality of health care is determined by changes in health status. Structural characteristics of the settings in which care takes place have a propensity to influence the process of care so that its quality is diminished or enhanced. Similarly, changes in the process of care, including variations in its quality, will influence the effect of care on health status.

Accountability for quality patient care and management of clinical outcomes are critical in today's competitive setting (health care) environment (Cohen, 2000). According to Ellis and Whittington (1993), outcome measures do have several basic advantages. Firstly, they reflect the totality of care received from the point of first admission to discharge. Second, they are readily understood and accepted as valid by both patients and providers. Finally, they can be used to indicate not just the quality of care received but the need for further or compensatory care. The specific outcome measures need careful consideration and are discussed later in the chapter.

3.3. Research problem

Improving patient outcomes is a priority within the NHS (Department of Health, 2004). A critical appraisal of the ICP literature suggests that an ICP can have a positive effect on some patient outcomes; however, there is little quantitative evidence to support this. To be able to determine the effect of an ICP on patient outcomes would be of significant value. Additionally, some of the literature advocates that staff engagement with an ICP determines how effectively the ICP is embraced in clinical practice (Ellershaw and Murphy, 2005; Johnson, 1995; Tingle, 1997). It was therefore important to understand the staff perceptions of the newly developed and introduced abdominal surgery ICP.

3.4. Research purpose

The purpose of this study was to determine if the use of an ICP was associated with more positive outcomes than with the use of traditional methods of care. The abdominal surgery ICP was developed through previous local research based on agreement of existing practice among clinical staff. The effectiveness of the ICP, however, previously had not been tested (in relation to traditional methods of care) to determine if it improved patient, provider or setting (health care) outcomes.

3.5. Research options

This section will not resolve the historical debate and philosophical dilemmas associated with quantitative and qualitative research. It will, however, give an overview of what I, the researcher, considered important and appropriate to the study of ICPs. One of the first decisions a researcher must make before a study can begin is the selection of a paradigm. This can be guided by a number of factors including the maturity of the concepts of interest, the researcher's level of curiosity leading to the research question and the values of the researcher.

Disciplined inquiry in the field of nursing is conducted within two broad paradigms (Polit and Hungler, 1997), positivistic and naturalistic. The naturalistic paradigm is interpretive, humanistic and is concerned with understanding the meaning of social interactions by those involved. Whereas, the positivistic paradigm operates on the strict rules of logic, truth, laws and prediction. The two alternative perspectives on the nature of reality have strong implications for the methods of gaining further knowledge. The methodological distinction focused on differences between quantitative research, which is most closely associated with the positivist paradigm, and qualitative research, which is most closely associated with the naturalistic paradigm (Polit and Hunger, 1997). Each is used to address different questions. The focus here is on the philosophical assumptions that underpin the research. In quantitative research, the researcher ultimately begins with a phenomenon that has been previously studied or defined, in this case through a local action research project and through studies described in the supporting literature.

3.6. Research design

There are different uses of the term 'research design'. For the purpose of this study the research design is classified by structure. The research design is important to any research study as it focuses the structure of the research project to best answer the question (DePoy and Gitlin, 1994) and provides a blueprint for the study. A variety of research designs are available. The scientific approach has enjoyed considerable status as a method of inquiry; however, this is not to say that it can solve all research problems or has not been without criticism (Polit & Hungler, 1997). The current research study needed to produce evidence for the local hospital Trust to inform the decision on the future use of ICPs, and to add quantitative evidence to the literature surrounding ICPs. Previously critiqued studies into ICPs highlighted different methodologies, each with their own benefits and limitations, producing findings for different questions. It was important to use a research design that would be fit for purpose given the clinical structure. There were two gynaecology units that were managed collectively and provided similar care to the local population. However, one unit had developed and introduced ICPs whilst the second unit continued to use traditional methods of care delivery. The research methodology needed to embrace the clinical situation and produce findings that would support the future direction for a newly merged gynaecology unit. Different research designs, methodologies and data collection methods obviously come with their benefits and limitations. To best achieve the overall aim, it was my opinion that different research designs would be employed to answer the three discrete research questions. A quasi-experimental design would be the most suitable for research question one (what effect does an ICP have on the outcomes of gynaecological patients attending for major abdominal surgery?), descriptive correlation for research question two (What factors including the use of an ICP contribute to the variance in length of stay for gynaecological patients?) and descriptive exploratory for the third research question (What are the opinions of the multidisciplinary staff who have used the ICP, of the ICP itself?).

Each of the research designs will now be considered in relation to their benefits and limitations. The specific data collection methods used will be considered later in the chapter in relation to the specific outcome measure.

3.6.1. Quasi-experimental design

Experimental research differs from non-experimental research in the fact that the researcher is an active agent in the experiment work rather than a passive observer (Pilot and Hungler, 1997). A major strength of experimental design is to enable control of variance or to take account of factors that may contribute to differences in the dependent variable. It supports the examination of an impact of a treatment (ICP) on designated outcomes. Pilot and Hungler (1997) describe a true experimental design as needing to have three properties: Manipulation (the experimenter does something to at least some of the participants), Control (the experimenter introduces one or more controls over the experimental situation, including the use of a control group), and Randomisation (the experimenter assigns participants to a control or experimental group on a random basis). However, achieving randomisation in the clinical field is perhaps one of the most difficult and challenging aspects of experimental research. An alternative to the true experimental design was needed for this study due to a number of factors: the existing clinical settings, the size of the research team and what the results would be used for. Campbell and Stanley (1963) state that one of the most widespread experimental designs in educational research involves an experimental group and control group, but in which the control and experimental group do not have pre-experimental sampling equivalence. Rather, the two groups constitute naturally assembled collectives as similar as available. Indeed, Cook and Campbell (1979) highlight that the quasi-experimental design is commonly used in nursing research studies conducted in the naturalistic settings, and it is still possible to replicate an experimental design closely by controlling for extraneous variables. Extraneous variables are classified as recognised or unrecognised and controlled or uncontrolled. Some extraneous variables are not recognised until the study is in progress or completed (Burns and Grove, 2005). For the purpose of this study, attempts were made to recognise and control as many extraneous variables as possible e.g. the use of inclusion and exclusion criteria in selecting the research subjects. An additional consideration was that of internal validity (the extent to which the effects detected in the study are a true reflection of reality, rather than being an effect of the extraneous variables). Threats to internal validity (Campbell and Stanley, 1963) with strategies for limiting these are presented in Table 7.

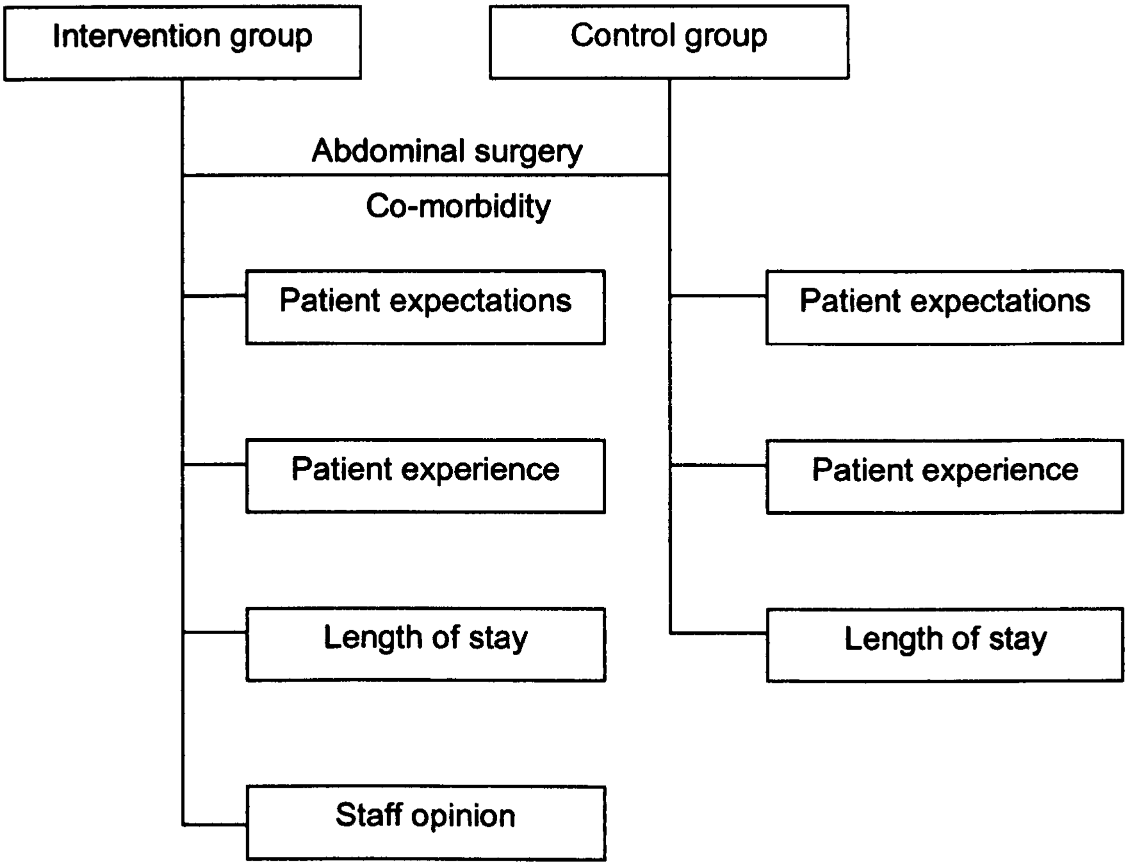
Table 7: Rationale for limiting threats to internal validity

Threat to internal validity	Rationale for limiting threat
1. History	Policy, procedural or managerial changes occurred simultaneously on both sites.
2. Maturation	Not applicable because nurses at both sites should gain experience of using the methods of care delivery as time progressed.
3. Testing	The expectation pre-test could influence experience/ satisfaction post test i.e. sensitivity of test reviewed.
4. Instrumentation	Ensured measurement instruments were reliable and valid. Used expectation pre-testing and experience post-testing.
5. Statistical regression towards the mean	A good selection of subjects were recruited that were representative of the larger population. Extreme cases were excluded e.g. malignant cases
6. Selection of sample	Allocation of research subjects to group i.e. ensured all qualifying patients entered into sample at both sites.
7. Experimental mortality	Attempted to retain research subjects by developing individualised 'Get Well Soon' cards (Appendix 22).
8. Interaction of sample	Non-contamination of groups. The two sites were geographically separate.
9. Diffusion or limitation of treatment	Ensured the groups did not meet/ mix with one another. Cross-contamination of research subjects did not occur.
10. Compensatory equalization of treatment	ICPs had not been proven to be beneficial and therefore the treatment intervention was not seen as beneficial.
11. Compensatory rivalry by respondents receiving less desirable treatments	Not applicable because the desirability of using the ICP had not been tested and the best method of case management had not yet been determined.
13. Resentful demoralisation of respondents receiving less desirable treatments	Not applicable because the desirability of using the ICP had not been tested.

Control is a key concept in quasi-experimental designs. Three types of control are identified; researcher's control over the research environment, control over the treatment variable and the ability to identify and rule out threats to internal validity (Burns and Grove, 2005). The latter type of control may be achieved by using a control or comparison group, that is to say that the ICP can be observed in a treatment group and compared to the effects observed in the comparison group. Mechanisms for controlling as many possible aspects in the study were sought. Control involves imposing conditions of the research situations so that biases are minimised and precision and validity are maximised. Two sites were used for the research study; site one had developed and implemented ICPs and therefore became the treatment site (experimental site), site two continued to use traditional methods of care planning and delivery and therefore became the comparison site (control site). Randomisation was not possible or feasible as the subjects already belonged to a specific group. The two groups were naturally comprised depending upon where the patients presented for treatment. Due to the lack of randomisation of the research subjects to the two groups there is a weakened confidence that the groups are comparable at the beginning of the study. Inclusion and exclusion criteria for the research subjects were used to strengthen the equivalency of the groups. Additionally, a pre-test on specific variables, including patient demographic and clinical characteristics was conducted prior to hypothesis testing to examine group equivalence. Preliminary analyses of the two groups' equivalence (patients) are reported in chapter four. Figure 2 provides an overview of the quasi-experimental design with comparable benchmarks. The additional threat of having non-randomised groups is that of the staff equivalence. Staff were managed collectively and followed the same guidelines, policies and procedures. Skill mix was comparable as was patient staff number ratio.

A final consideration with a quasi-experimental design is that of the Hawthorne effect. In that, both patients and staff would know that they were in a study, and this may be sufficient to cause people to change their behaviour, thereby obscuring the effect of the variable of interest. Unfortunately it was not possible to hide the fact that an experiment of ICPs was being undertaken.

Figure 2: Quasi-experimental overview



3.6.2. Descriptive correlation

The intention of the second question was to examine the type (both positive and negative) and strength of relationship between variables. Correlation enables the researcher to make predictions about phenomena (Pilot and Hungler, 1997). Obviously one of the key factors within this design is the choice of the specific variables. Length of stay was chosen as the dependent variable following careful consideration of the findings from previously published and critiqued literature. A theoretical model (with independent variables) was developed and tested which is discussed later in the chapter.

3.6.3. Descriptive exploratory

The purpose of obtaining staff opinion was to describe concepts and identify relationships. Throughout the literature the issue of staff engagement was raised as a crucial aspect of the success of the ICP. It was therefore considered important to understand the staff's opinion of the newly developed and implemented ICP. On reviewing other studies there appeared to be two mechanisms to obtain staff feedback, one through direct staff contact (either focus groups or one to one interviews) or through written feedback (either specific questionnaires or analysis of variance via patient records). I was the only person able to collect staff feedback and therefore had concerns about requesting face-to-face feedback. I continued to work on the gynaecology unit and was known to be undertaken the research study. I had concerns that staff might give biased responses about the ICP if I approached them directly. Therefore, a method of data collection not involving direct contact with the staff for the purpose of data collection was adopted for this study.

The specific variables and data collection instruments are critiqued following presentation of the three research questions and subsequent hypotheses.

3.7. Research questions

To ensure the research problem could be answered, the following three research questions were developed for testing:

1. What effect does an ICP have on the outcomes of gynaecological patients attending for major abdominal surgery?
2. What factors including the use of an ICP contribute to the variance in length of stay for gynaecological patients?
3. What are the opinions of the multidisciplinary staff who have used the ICP, of the ICP itself?

Relevant directional hypothesis were derived for the research questions. The hypotheses are presented, and variables associated with each hypothesis are conceptually and operationally defined following the discussion on the research design.

3.7.1. Research question one

What effect does an ICP have on the outcomes of gynaecological patients attending for major abdominal surgery?

To answer question one, ten testable directional hypotheses were derived from the research question. Eight of the ten hypothesis (with the exception of hypothesis four and five) reflect a positive relationship between the ICP (independent variable) and an outcome (dependent variable). The eight directional relationships are suggested as positive due to previous ICPs studies findings. A statistical significance of ≤0.05 was set.

3.7.1.1. Hypotheses one to ten:

1 Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have a statistically significant higher level of expectation of nursing care than to a similar group of patients who receive traditional care.

2 Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have a statistically significant higher level of experience with nursing care compared with a similar group of patients who receive traditional care.

3 Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have a statistically significant higher level of satisfaction with nursing care compared with a similar group of patients who receive traditional care.

4 For gynaecology patients undergoing major abdominal surgery who have care administered using an ICP, there will be no statistically significant differences between expectation of nursing care and experience of nursing care.

5 For gynaecology patients undergoing major abdominal surgery who receive traditional care, there will be no statistically significant differences between expectation of nursing care and experience of nursing care.

6 Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have a statistically significantly higher opinion of their own physical health post-operatively compared with a similar group of patients who receive traditional care

7 Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have a statistically significantly higher opinion of their own mental health post-operatively compared with a similar group of patients who receive traditional care.

8 Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have statistically significantly lower complications compared with a similar group of patients who receive traditional care.

9 Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have a statistically significantly shorter length of stay compared with a similar group of patients who receive traditional care.

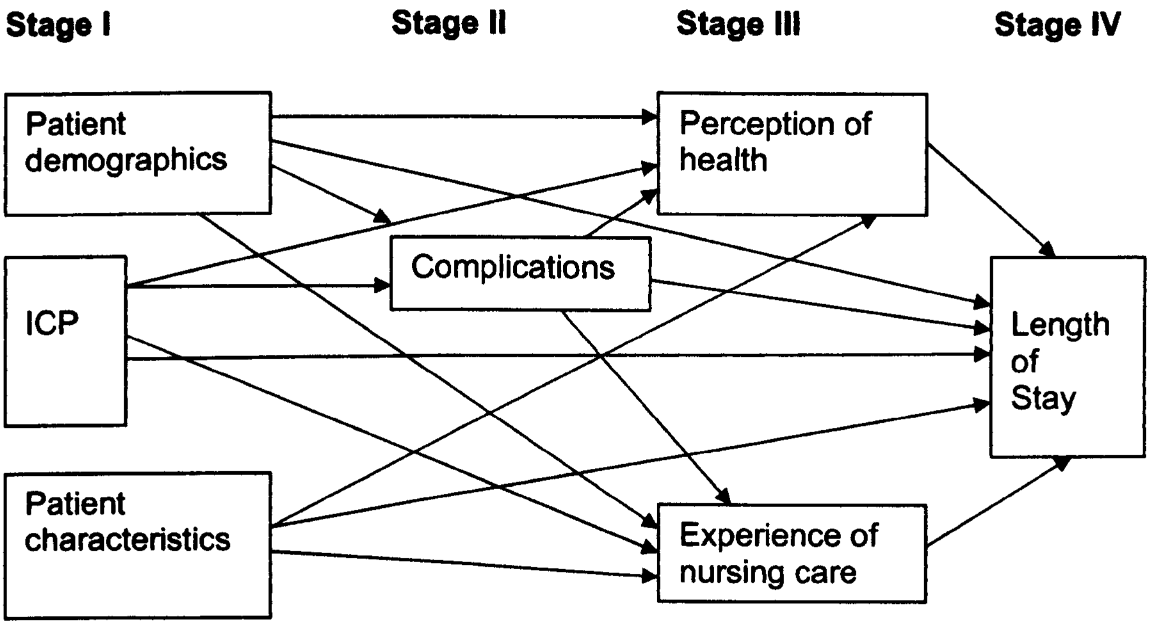
10 Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have statistically significantly fewer re-admissions to hospital within 30 days of discharge compared with a similar group of patients who receive traditional care.

3.7.2. Research question two

What factors including the use of an ICP contribute to the variance in length of stay for gynaecological patients?

To answer this question a multivariate approach was undertaken to determine which variables contributed to length of stay. Figure 3 depicts an overview of the concepts hypothesised to influence length of stay. This theoretical model will be presented with operational variables later in the chapter. Concepts will be references with operational variables.

Figure 3: Conceptual model of factors hypothesised to explain length of stay.



3.7.3. Research question three

What are the opinions of the multidisciplinary staff who have used the ICP of the ICP itself?

To answer this question, descriptive exploratory data were collected from the staff using the ICP on the treatment site.

3.8. Research variable definitions and measurement tools

To study phenomena, one must first attempt to measure them and, therefore, use a valid and reliable measurement method. Finding accurate measures for variables is challenging but fundamental to substantiating findings. Measurement begins by clarifying the object, character or element to be measured (Burns and Grove, 2005). Quasi-experimental designs have three basic types of variables: Independent, dependent and extraneous or confounding variable. An independent variable is the presumed cause of variation in the dependent variable, the presumed effect. In other words, the independent variable has a potential influence on the dependent variable and always precedes specific changes in the dependent variable. The independent variable is also known as the treatment or experimental variable. For the purpose of this study, the independent variable of interest is the ICP. The dependent variables are those outcomes explained or predicted by the independent variable. The dependent variables will include patient, provider and setting (health care) variables. The third type of variable, known as an extraneous or confounding variable, are those phenomena that have an effect on the dependent variables but are not included in the study design.

3.8.1. Data categories

Data were collected on four different categories of data: patient demographics, patient characteristics, outcomes and staff characteristics. Table 8 (page 81) outlines the category of data, variable being measured and measurement method. The patient demographics, patient characteristics and outcomes were collected to answer research questions one and two. The staff characteristics were collected to answer research question three.

The variables were operationally defined with specific instruments that were evaluated for reliability and validity. Reliability and validity are important concepts to consider when selecting an appropriate research instrument as they underlie measurement precision. The technique of measuring variables must be reliable if true differences are to be found in the variable. The reliability of a measure represents the consistency of measures obtained. For example, the same measurement tool should report the same result if used in the same conditions. Reliability testing is considered a measure of the amount of random error in the measurement technique and is expressed as a form of correlation coefficient. It is acknowledged (Burns and Grove, 2005) that all measurement techniques contain some random error. Reliability of 0.80 or higher is considered acceptable for well-developed measurement tools, whereas 0.70 is acceptable for newly developed instruments. The reliability co-efficients are reported in the results chapter for each of the instruments. Validity of an instrument refers to the extent to which the instrument actually reflects the abstract concept being examined. The concepts are referenced by variables. The data collection instruments were critically appraised in relation to the extent to which they reflected the variable of interest. The timing and place of administration of the data collection instruments are also discussed.

Table 8: Types of data

Category of data	Variable	Measurement method
Patient demographics	Age	Patient case note
	Marital status	Demographic profile
	Number of dependants	Demographic profile
	Support on discharge home	Demographic profile
	Age of leaving full time education	Demographic profile
	Socio-economic status	Patient case note
Patient characteristics	Reason for surgery	Patient case note
	Expectation of nursing care	Questionnaire adapted from the Newcastle Satisfaction with Nursing Scale
	ICP	Patient case note
	Type of incision	Patient case note
	Operation performed	Patient case note
Outcomes	Experience of nursing care	NSNS questionnaire
	Satisfaction of nursing care	NSNS questionnaire
	Perception of return to pre-morbid function	SF-36 questionnaire
	Complications	Patient case note
	Length of stay	Patient case note
	Re-admission to hospital within 30 days of discharge	Patient case note
	Reason for re-admission	Patient case note
Staff characteristics	Staff opinion of ICP	Staff opinion questionnaire

3.8.2. Patient demographics

To examine group equivalence data on specific demographic variables; age, marital status, number of dependants, support on discharge home, age of leaving full time education and socio-economic status were collected and analysed. The demographic specific information was selected based on findings from previous research (Eames et al., 1993; Saul & Payne, 1999; Thomas et al., 1996). The results of the demographic data comparison are reported in the results chapter. Table 9 provides an overview of the variable, data collection tool and level of measurement for each patient demographic variable.

Table 9: Patient demographics

Variable	Data collection tool	Level of data
Age	Date of birth	Interval
Marital status	Demographic profile	Nominal
Number of dependants	Demographic profile	Interval
Support on discharge home	Demographic profile	Nominal
Age of leaving full time education	Demographic profile	Nominal – either below or above 16 years
Socio-economic status/ health	Townsend index	Ordinal

3.8.2.1. Age

Age was calculated in years from the research subjects' date of birth that was recorded in the patients' case notes.

3.8.2.2. Marital status, number of dependants, support on discharge home and age at leaving full time education

Research subjects were individually asked information on their marital status, the number of dependants, support on discharge home and age of leaving full time education. Marital status was categorised into single or living with significant other to reflect both married and unmarried couples. Support on discharge home was classified into none, some or a great deal, and was determined by the individual patient. This information was recorded on the demographic data sheet (Appendix 5).

3.8.2.3. Socio-economic status

Previous studies (Drever and Whitehead, 1995; Yuen et al., 1990) suggest that there are systematic differences in the health of social groups. A method of relating health and socio-economic status for an individual is to determine their social deprivation score. However, before determining the most appropriate method to obtain the social deprivation score it is imperative to explore the meaning of deprivation.

Deprivation can be defined as:

> 'A state of observable and demonstrable disadvantage relative to the local community or the wider society or nation to which an individual, family or group belongs'
>
> (Townsend, 1987, Page 125).

It is difficult to disentangle the relative importance of different forms of deprivation on health, personality or social pathology. Deprivation involves a lack of something generally held to be desirable e.g. an adequate home, income, or good health. One of the most accepted methods of identifying deprivation is by using the Townsend Deprivation Index (Morris and Carstairs, 1991). The Townsend Deprivation Index was designed as a general measure of deprivation. Townsend developed this index in work conducted originally in Bristol and later in a study of health and depravation in the north of England (Townsend, 1987). The components of the index are the percentage of economically active residents aged 16-59/64 who are unemployed, the percentage of private households that do not own a car, the percentage of private households that are not owner occupied and the percentage of private households with more than one person per room. The Townsend indices are generally more useful in discriminating between populations than other indicators (Saul and Payne, 1999). The Townsend index was adopted by the Strategic Health Authority (in which this research study was conducted) as the standard method of identifying the pattern of deprivation (Saul and Payne, 1999). The score is an overall combined measure for the electoral wards on the four indicators incorporated into the Townsend index, based on the 1991 census. It is worth noting that the 1991 census, although over 10 years old does not change dramatically over time and is therefore used as the reference point for this study.

The larger the Townsend index, the greater the deprivation. Positive scores are above the average, and negative scores are below the average for deprivation. For example using this index in the city in which the study was conducted, the worst deprivation score reported was six, and the smallest deprivation score was minus eight. Although the index gives a score it is not possible to say that a score of six is 14 worse than a score of minus eight due to the way the index is calculated. It is more useful to group wards into areas of similar levels of deprivation (e.g. 2.5 to 5 as most deprived; -3 to 2.5 as average; -9 to -3 as least deprived). The scores for each ward indicate an average position for that ward and there may be considerable variation in the levels of deprivation. However, this tool still remains the most reliable for the information needed for this study and is, therefore, employed as the socio-economic health indicator for the demographic data collection instrument.

3.8.3. Patient characteristics

Patient characteristic data included reason for surgery, expectation of nursing care, use of ICP, type of incision and operation performed. Group equivalence for these characteristics was also examined. Table 10 provides an overview of the variable, data collection tool and level of data for the patient characteristics.

Table 10: Patient characteristics

Variable	Data collection tool	Level of data
Reason for surgery	Patient case notes	Nominal
Expectation of nursing care	Modified Newcastle Satisfaction with Nursing Scales Questionnaire (NSNS)	Interval
ICP	Patient case notes – present or not	Nominal
Type of incision	Patient case notes	Nominal
Operation performed	Patient case notes	Nominal

3.8.3.1. Reason for surgery

The reason for patients requiring major abdominal gynaecological surgery could influence their outcome. For example, if a patient was suffering from prolonged menorrhagia (irregular, non-cyclical, bleeding usually heavily) one could argue that these individuals would recover more quickly due to wanting the treatment. Likewise, those patients who were not experiencing the same symptoms but still required the surgery could respond differently. Data were therefore collected and analysed to determine whether there were any significant differences between the two sites on the reason for surgery. The medical practitioner obtaining the consent documented in the patients' case notes the symptoms and rationale for the proposed operation. The patient case notes were used retrospectively to obtain these data.

3.8.3.2. Expectation of nursing care

In nursing, identifying patients' needs and subsequent plan of care is achieved through patient participation and choice in their care. Gathering patient opinion on their nursing care to examine the quality of care expected is therefore appropriate. Other researchers have used tools to measure patient satisfaction and focus on medical interventions and not nursing effects on patient satisfaction within the service. The focus on care delivery in this study was on nursing activity. Additionally, it is the nursing staff who predominately plan and deliver care using the ICP.

An analysis of the literature relating to the contracting, delivery and evaluation of health services indicates an increasing emphasis on quality as an indicator of success (Department of Health, 2004). The quality of patient care provided by the health care professional is of major concern due to the difficulty in measuring it as a precise activity or outcome (Swage, 1997). It has long been recognised that the attitudes and behaviours of health care personnel play a key role in a patient's evaluation of health care quality (Kemppainen et al, 1999). Gaining an understanding of patients' views is essential for maintaining and improving the health service. Patient satisfaction has often been used as a proxy indicator of quality; however, an analysis of the theoretical literature revealed a multitude of problems with the study of patient satisfaction alone. Criticisms included the fact that the concept of satisfaction is poorly defined. If there is uncertainty about what patient satisfaction is then there is uncertainty about what is being measured (Sitzia and Wood, 1997; Williams, 1994). Various, potentially more constructive, alternatives exist including the measurement of patient expectations. Definitions of expectation vary widely in the literature from needs, requests or desires/ wants (Buetow, 1995; Like and Zysanski, 1987; Williams et al, 1995). The dominant definition of consumer satisfaction involves the comparison of what is expected with what is actually received (Oliver, 1989). With precise and accurate use, patient expectations compared with their experiences may be more constructive and may better represent the quality of care outcome measures than patient satisfaction alone. Additionally it is well known that hospitalisation for surgery is associated with increased anxiety (Dodds, 1993). Raised anxiety has important clinical significance in relation to post-operative recovery (Boeke et al., 1991). Therefore understanding and managing expectation may help to alleviate anxiety. Additionally it is argued by De Luc (2000) that significant changes in satisfaction levels are unrealistic given the normally high levels reported when collecting user satisfaction information. Instead, it would seem more relevant that satisfaction changes can occur in precise areas that can be linked to some kind of change resulting from the introduction of an ICP. One way to capture the specific change is to ascertain expectation levels and compare them to experience levels.

Following a review of the literature on patient expectation, measuring patient expectation of nursing care seemed to be a relatively new phenomenon. Other studies have concentrated on different types of patients i.e. understanding the difference in expectation depending upon the underlying medical condition and have tended to focus on the medical staff intervention, specifically in the primary care setting (Staniszewska and Ahmed, 1999). No sensitive, reliable and valid measurement tool could be identified as suitable for this study. A new expectation of nursing care data collection instrument needed developing and this was achieved by revising the Newcastle Satisfaction with Nursing Scale

(NSNS) of patient experience. The newly developed expectation questionnaire captured the same statements as expressed in the NSNS experience questionnaire but in an expectation context (Appendix 6). A separate information sheet and consent form was developed to test the expectation questionnaire (Appendix 7). Experts in the form of a similar group of patients to that of the study participants were asked to judge the relevance of the expectation questions. Feher Waltz et al. (1984) suggest that an index of content validity can be achieved by independently rating the relevance of each question using a four point Likert scale; not relevant, somewhat relevant, quite relevant and very relevant. The content validity index is defined as the proportion of items giving a rating of either not relevant and somewhat relevant or quite relevant and very relevant by raters. If all agree, the content validity index is 1.00 and inter-rater agreement is perfect. Anything less than 0.50 is considered unacceptable and suggests that the question should be removed. The newly developed expectation questions were checked for content validity using five patients (three from site one and two from site two). The expectation questionnaire resulted in 24 statements with a seven-point Likert scale for response. Two questions (number eight: I expect the nurses to turn the lights off too late at night; and number ten: I expect the nurses to make time for me no matter how busy they are) were removed from the original experience questionnaire (Appendix 8) due to these questions receiving a not relevant score from the pilot group. The expectation scale was not pre-tested prior to use due to the strong reliability of the experience scale; however, the reliability was tested prior to final analysis and the results are reported in the results chapter.

3.8.3.3. ICP

The ICP variable was manipulated in this study. All patients on the treatment site had care delivered using the major abdominal surgery ICP. All patients on the comparison site continued to have care delivered using traditional methods. The development of the major abdominal ICP has been described in detail in the previous chapter. The ICP replaced all existing methods of documentation and was stored in the patients case note file. The ICP commenced at the pre-operative clinic visit and was used throughout the in-patient episode until the time of discharge. The ICP was only used at the six week follow up appointment to review the in-patient care. A page from the ICP in-patient stay is provided in Figure 4 (page 92). A full example of the developed ICP can be viewed in Appendix 2.

Figure 4: A page from the abdominal surgery ICP in-patient stay

SURNAME: ______________________ **FIRST NAME:**__________________

HOSPITAL NUMBER: ________________ **DATE:** __ / __ / __ SIGNATURE

NUMBER	DAY ONE (07.00hrs to 06.59 hrs)	STAFF DISCIPLINE	07.00hrs 14.59hrs	15.00hrs 21.29hrs	21.30hrs 06.59hrs
1	Maintain O_2 therapy until: …… Airways maintained.	RGN			
2	Apyrexial. Normotensive Pulse normal. 4 hourly observations cont.	RGN			
3	Wound dressing intact and dry.	RGN			
4	Abdo drains contain less than 100mls.	RGN			
5	Vaginal bleeding minimal	RGN			
6	Pain controlled. Pain score chart maintained.	RGN/ MED			
7	a) Maintain intravenous fluid/ blood transfusion as prescribed. b) Cannula site patent. c) Commence oral fluids.	RGN/ MED			
8	No nausea or vomiting.	RGN/ MED			
9	Urine output greater than 30mls an hour. Remove catheter.	RGN			
10	Pressure areas inspected: skin intact, normal colour and temp. Waterlow score documented.	RGN			
11	Moving and handling reassessed.	RGN			
12	No evidence of thrombosis. Continue leg and deep breathing exercise/ mobilise out of bed.	RGN/ S/W			
13	Review: Chest / Abdominal bowel sounds / Legs / Medication.	MED			
14	Administer medication.	RGN			
15	Emotional well being satisfactory.	RGN/ S/W			
16	Personal hygiene needs provided including mouthcare.	RGN/ S/W			
17	Plan of care discussed with patient/relatives (with consent).	RGN/ MED			
18	Patient assisted into a comfortable position.	RGN/ S/W			
19	Slept well.	RGN / S/W			

DATE AND TIME	PROGRESS NOTES	SIGNATURE

3.8.3.4. Type of incision

The surgical incision can influence recovery. For example, a midline incision takes longer to heal than a transverse incision due to the way in which the tissue fibres are cut. The type of incision was recorded in the patients' case notes by the surgeon and these data were collected retrospectively. The data were compared between the two sites to ensure that there were no statistically significant differences.

3.8.3.5. Operation performed

The operation (surgical procedure) performed is another variable that could have an implication on patient outcome. This datum was collected retrospectively from the patients' case notes to ensure the two groups were comparable. Additionally the surgeons (15 in total) only worked in either the treatment or comparison site. The surgeons had comparable experience, waiting lists, theatre availability and also followed standard operating procedures working within the same management framework i.e. using standardised guidelines and procedures. It is therefore considered unlikely that surgeon variability would influence the overall findings.

3.8.4. Outcomes

It was imperative to collect and analyse outcomes that were thought to be attributed to ICP use. A critical appraisal of the literature on ICPs highlighted several variables of interest including an improvement in the overall patient experience, a reduction in the number of patient complications and a reduction in the overall inpatient length of stay. The search for adequate tools to monitor and evaluate the quality of care is not new. Data were collected on experience of nursing care, satisfaction with nursing care, perception of return to pre-morbid function, presence of complications, length of stay, re-admission to hospital within 30 days of discharge and reason for any re-admissions. Table 11 provides an overview of the variable, data collection tool and level of data for outcome variables.

Table 11: Overview of data collection tool and level of data for variables

Variable	Data collection tool	Level of data
Experience of nursing care	Newcastle Satisfaction with Nursing Scales Questionnaire (NSNS)	Interval
Satisfaction with nursing care	Newcastle Satisfaction with Nursing Scales Questionnaire (NSNS)	Interval
Perception of health	SF-36 Questionnaire	Interval
Presence of complications	Patient case notes	Nominal – none or one or more
Length of stay	Patient case notes	Interval – hours
Re-admission to hospital within 30 days of discharge	Patient case notes	Nominal – either readmission or no readmission
Reason for re-admission	Patient case notes	Nominal

3.8.4.1. Experience of nursing care and satisfaction with nursing care

Care cannot be considered to be of a high quality unless patients' state that they are satisfied (Vuori, 1987). Donabedian (1987) argues that consumers are valuable, even indispensable, sources of information in judging the quality of care. Mahon (1996) identifies that the patients' impression of the care that they receive is dependent upon how satisfied they are with the nursing care. Satisfaction is a complex concept that is related to a number of factors including life style, past experiences, future expectations, and the values of both individual and society (Carr-Hill, 1992). However, Carr-Hill (1992) argues that by dividing satisfaction into specific domains of a patient's life makes it understandable. Obtaining the patients' views regarding their experience and satisfaction of their nursing care to a specific episode of care is one mechanism to understand how satisfied patients felt. Additionally, previous articles have stated that, through the introduction of an ICP, patients have a clearer understanding of their journey and therefore are more satisfied with the care they receive (Johnson, 1997; Currie and Harvey, 1999). Unfortunately, the articles do not state the data collection instrument used to obtain patient satisfaction. Avis (1995) argues that current approaches to measuring satisfaction may not be grounded in the values and experiences of patients. It was important that the instrument used captured patients' values. There are many examples of data collection instruments designed to capture patient satisfaction of nursing care. However, many have been developed and used for specific studies and have not been assessed for validity and reliability (Thomas and Bond, 1996). Several studies have used qualitative methods to determine important issues from the patients' perspective with regard to care. However, this approach would not yield comparable data across two settings. Other instruments have included patient satisfaction within assessing a broader hospital experience (Moores and Thompson, 1986). Again, the overall experience of the hospital is less important in this study. Tools need to be sensitive to the purpose for which they are intended (Bond and Thomas, 1992). The purpose of the study was to gain the patient's views on their nursing care to determine whether an ICP had an impact on this. The instrument therefore needed to be sensitive to nursing care at ward level to allow comparison. Following a thorough review of the literature surrounding patient satisfaction data collection instruments the Newcastle Satisfaction with Nursing Scales (NSNS) questionnaire was the data collection instrument of choice for this study (Thomas et al., 1996). Other instruments were scrutinised and rejected on the grounds that they did not capture the specifics of satisfaction in relation to acute care (e.g. La Monica-Oberst Patient Satisfaction scale; Risser patient satisfaction instrument; Erikson, measuring patient satisfaction with nursing care).

The NSNS questionnaire has three subscales to the questionnaire; experiences of nursing care, satisfaction with nursing care and demographic information. The experience questionnaire contains 26 statements with a seven-point Likert-type scale for responses. The satisfaction questionnaire has 19 statements with a five-point Likert-type scale. It is unclear as to how the Likert-type scale response options were established for each questionnaire. Internal consistency was reported (Cronbach's alpha was 0.91 for experience and 0.96 for satisfaction) as satisfactory for both. Thomas et al. (1996) also collected and analysed the patient demographics to ensure the results from the questionnaire were in relation to the ward and not individual specifics e.g. age, education attainment. The experience and satisfaction scale was found to identify differences between both wards ($p=0.001$) and hospitals ($p<0.001$).

The Newcastle study commenced in 1993 to develop a psychometrically sound measure of patients' experience of and satisfaction with nursing care from a patient's perspective. The intended use of the questionnaire is to enable researchers to evaluate nursing interventions. Individual patients and focus groups were held and participants were asked what they perceived as good or bad quality nursing care. Themes emerged that were used to develop items. The items were further revised in two phases of refinement and item reduction until the final version was established. The questionnaires on experience of nursing care and satisfaction with nursing care have scales that are summed and transformed to yield a final score from 0 (worst experience or satisfaction) to 100 (best experience or satisfaction). A mixture of positively and negatively worded statements was included to minimise bias and fatigue. Eligible patients ($n=2054$) were identified to participate in the study, and an 82% response rate was achieved (Thomas et al., 1996).

The questionnaires were designed to collect individual patient data but the unit of analysis is at the ward level as scores can be aggregated and used to compare and contrast two groups of patients in different wards or hospitals. The instruments are suitable for this study for the purpose of comparing the ward scores of the two sites included in the study.

Construct validity of the instrument was confirmed by gender, age and age at leaving full time education (Thomas et al., 1996). Gender was unrelated to either experience or satisfaction with nursing care. Age was significantly associated with experience scores ($p<0.001$), the greater the age, the more positive the experience. However there was no association between age and satisfaction ($p=0.22$). The age at completing full time education was associated with a difference in experience and satisfaction scores. Those who left full time education earlier rated experience and satisfaction with nursing care more positively ($p<0.01$).

To eliminate the response rates and scores bias due to place of administration and completion of the questionnaire, 102 patients were randomly re-sampled and resent the questionnaires after 10 days discharge. There were no significant differences in the response scores for individual responses ($p>0.05$) for both experience of nursing care and satisfaction with nursing care. This result supports the use of these questionnaires after discharge home, as the time delay did not affect the score results (Thomas et al., 1996).

Registration for the Newcastle Satisfaction with Nursing Scales was necessary to use the questionnaires. Instructions for reproducing the questionnaires with computer software were used to ensure continued validity and reliability. One question on gender was deleted from the original questionnaire as the entire sample for this study were female and it was felt that this item was unnecessary. The internal consistency reliability for this research is reported in the following chapter. A copy of the patient experience and satisfaction of nursing care questionnaire is in Appendix 9.

3.8.4.2. Perception of health

The primary aim of health care is to improve or maintain the overall functional capacity and general health of patients. Assessing the benefits of interventions by measuring perceptions of the health of individuals is important (Brazier et al., 1992). The recognition of the patients view point as central to monitoring and evaluating health care has brought with it numerous approaches to the measurement of subjective well-being. Several tools to measure mortality and morbidity exist within the NHS, but many are too specific particularly when studying more than one condition e.g. Diamond et al, Callahan, Coons et al, Khan et al, Nottingham health profile distress index, Rosser index, Skovlund and Quality of well being scale. The instrument required for this study needed to capture information on a more global perspective that included more than one possible condition and a full range of illnesses. Subjective health measures have been advocated as a method of evaluating the effect of different methods of providing and or funding health care and to assess the impact of cost containing strategies (Brook et al., 1993; Tarlov et al., 1989). Several instruments were examined for suitability for the study and rejected on the grounds that they were not specific enough. The SF-36 health survey questionnaire was used, as it was able to capture the patient's perception of their health and had been used in previous studies involving patients undergoing gynaecological procedures (Sculpner et al., 1996). The SF-36 is an internationally accepted measure of health related to quality of life that has been extensively tested and validated (Brazier et al., 1992).

The SF-36 was developed from work led by Ware (Ware et al., 1980) in the late 1970s, and is a self-administered patient questionnaire containing 36 questions and takes about five minutes to complete. All the questions refer to the previous four-week period, which is important in the context of this study, as the questionnaire was administered six weeks post-operatively. Using the SF-36, the health of the individual is measured on an eight multi-item dimension (physical functioning, role limitations because of physical health problems, bodily pain, social functioning, general mental health, role limitation because of emotional problems, vitality and general health perceptions). The SF-36 also includes a single item measure of health transition or change and can be divided into two aggregated summary measures; the physical component summary and the mental component summary. The SF-36 detects positive as well as negative states of health. All the items are coded, summed and transformed onto a scale from 0 (worst health) to 100 (best health) giving one total score for the patient (Jenkinson et al., 1996).

Brazier et al. (1992) tested the reliability and validity of the SF-36 on the British population. As a result, six questions were re-worded to make them acceptable to British patients. The SF-36 was tested in two General Practitioners practices (both within the same city as the current research). Socio-demographic characteristics were representative of the general household survey and, therefore, the results were transferable to the general population. There was an 83% response rate with no clinically significant missing data. Non-respondents were identified as younger men. This does not give rise to concern for its use within the current research study, as only females were included in the study sample. Internal consistency was acceptable ($\propto$>0.85). Correlation coefficients supported reliability (>0.75) for all dimensions except social functioning. Test-retest reliability was identified as excellent as respondents did not result in a different end score (Brazier et al., 1992). There was evidence of construct validity and discriminatory power highlighting different levels of ill health within the eight dimensions. The SF-36 was also able to detect low levels of ill health. Final scores of the physical and mental component summary measures derived from the eight dimensions of the SF-36 were obtained and used for comparison of the two study sites included in the study (Brazier et al., 1992). The SF-36 was identified as an acceptable measure of the general population with relatively minor conditions and was therefore employed as a valid and reliable tool for this current study. There is substantial evidence documented on the reliability and validity of the SF-36 scale and therefore this was not re-tested (Jenkinson et al., 1996). The SF-36 questionnaire is in Appendix 10.

3.8.4.3. Cumulative rating scales

An unresolved issue in data analysis is when parametric rather than non-parametric tests should be used. Some writers have argued that it is appropriate to use parametric tests only when the data fulfil three conditions; the scale of measurement is equal to interval level measurement; the distribution of the population scores is normal; and the variances are both equal. Bryman and Cramer (1997) argue that the need to meet these three conditions is strongly questionable. As far as level of measurement is concerned, it has been suggested that parametric tests can also be used with ordinal level data since tests apply to numbers and not what those numbers signify. Munro and Page (2001) also argue that parametric techniques with ordinal data rarely distort the results. With respect to the population being normally distributed and of equal variance, a number of studies (Boneau, 1960; Games and Lucas, 1966) have been set up to violate these conditions and have been found not to differ greatly from those samples which have been drawn from the population which do not violate these conditions. One exception to this general finding was where both the size of the sample and the variances were unequal. The instruments of expectation of nursing care, experience of nursing care, satisfaction with nursing care and the SF-36 collect data through the use of a seven point Likert-type scale, or summative rating scale. These summative rating scale scores are converted to a number to produce a cumulative score ranging from 0 to 100, with 100 being high. The difference between each of the numbers is seen as equal i.e. 80 is twice as much as 40. It is the final cumulative score that is used in analysis and therefore the data are treated as interval level data. Ordered categorical scale (ordinal level data) in the design stages but when transformed and summed are often analysed as continuous level data. It is often worth treating discrete scales as continuous. An informal rule of thumb (based on the Whitehead's sample size formula for ordinal data) is that discrete scales should be treated as continuous if it has 7 or more categories (and it is plausible that there is an underlying continuum) and the data is normally distributed (with equal variance). The Mann-Whitney U is 96% efficient relative to the t-test (Walters et al., 2001). Parametric statistics are more powerful and sophisticated. Non-parametric statistics use the data in ranks, which does not allow the whole of the data to be used, and consequently, some information is wasted (Eaton, 1997). The data was analysed using both parametric and non-parametric tests resulting in comparable statistically significant results (these are reported in Appendix 11). Taking all of the above into consideration, data are presented using parametric tests in the results chapter.

3.8.4.4. Complications

Post-operative complications are a contributing factor to the recovery process. Clare et al. (1995) suggest that by using an ICP complications can be detected early and, therefore, treated efficiently. All complications were recorded from the patient's case notes. For the purpose of analysis and for between site comparison, the complications have been grouped as 'no complications' or 'one or more complications'. Examples of complications from gynaecological abdominal surgery include bladder injury, urine infection, wound infection, uncontrolled pain, constipation, and thrombosis. Appendix 12 provides a list of all expected complications used for data collection.

3.8.4.5. Length of stay

The length of stay of an in-patient episode has significant cost implications on the health service and is, therefore, an important outcome to monitor when evaluating care management. An average bed night costs approximately £527 (based on information obtained from the finance general area reference costs 2005) for a gynaecology in-patient at the research study site. Throughout the ICP literature, length of stay is quoted as being reduced (Dowsey et al., 1999) when an ICP is introduced. However, previously published studies have not explored whether other variables may have contributed to this reduction in length of stay. Experience of care (Bond & Thomas, 1991) and perception of own health (Brazier, 1992) play an important role in influencing the well being of an individual and thus potentially also may influence length of stay.

The length of stay for each patient was calculated by the number of hours the patient spent as an in-patient. This information was obtained from the patients' case notes. The date and time of the admission, operation and discharge were collected to examine possible significant differences between the two sites.

3.8.4.6. Re-admission to hospital within 30 days of discharge

A re-admission to hospital following a planned discharge can be an indication that the patient was discharged too early. Re-admission to hospital has important financial implications for the health service and could also influence the patient's perception of their health. Ayestas et al. (1999) suggest that an ICP can reduce re-admission rates. Re-admission to hospital within 30 days of discharge was recorded to determine if this had occurred with the research subjects. The patient case notes were used to obtain these data (a copy of the data collection sheet is in Appendix 12).

3.8.5. Staff characteristics

3.8.5.1. Staff opinion of the ICP

Identifying the multidisciplinary staff perceptions of an ICP is an important consideration when determining its impact (Hale, 1997). Johnson (1997) states that staff ownership and appreciation of the ICP directly influences the potential impact of the ICP on patient outcomes. That is, if a staff member believes that the ICP is of benefit to them individually then they will use the ICP accurately and effectively which in turn will lead to improved patient outcomes. If, however, the staff can see no benefit from using an ICP then they are unlikely to change their existing practice and follow the recommended new pathway. Additionally, understanding the staff's opinion of the newly implemented ICP would be valuable for any future development and implementation plans. Obtaining the staff's opinion of the ICP was, therefore, considered to be important.

As discussed previously, consideration was given to the approach of data collection from the staff. The data needed to be objective to allow staff to express their thoughts anonymously on the newly developed and implemented ICP. Interviews were ruled out due to the potential bias created during data collection (Hawthorne effect). I was the only data collector and continued to work in the clinical setting where the study was being undertaken during the entire study period inclusive of data collection. An instrument that allowed staff to self-report in an anonymous manner would therefore be most appropriate. A locally developed structured questionnaire (Appendix 13) was distributed to all members of the multidisciplinary team working on the treatment site. The staff questionnaire had been developed during a previous study (Debbage, 1997) and reflected previous studies findings. The questionnaire contained six closed questioned directional statements relating to the ICP in respect to multidisciplinary teamwork, ease of use, clinical management of patients, documenting time, quality of information available to patients and clinical judgement. The six statements were developed from themes identified in the literature surrounding ICP development and implementation. Each statement had a five point Likert-type scale to capture responses ranging from disagree completely to agree completely. A Likert-type scale was chosen for the six questions to allow respondents some freedom. A visual analogue along a 100mm line (from very useful to not very useful at all) in relation to how the ICP might support audit, research and teaching was also included in the questionnaire. Audit, research and teaching were all identified from previous studies as being of high importance in relation to ICPs (Alder et al, 1995; Fox and Anderson, 1996; Gibb and Banfield, 1996; Hale et al, 1997; Johnson, 1997; Smith and Koch, 1997; Wilson, 1995). Likert-type scales are considered a sophisticated scaling technique for the measurement of attitudes (Polit and Hungler, 1997). An overall best and worst comment about the ICP was requested and an open-ended statement was included to prompt for any other comments. The questionnaire had been used during a previous study and therefore had been tested to ensure it was clearly worded and obtained relevant information. The questionnaire can be seen in Appendix 13. The questionnaire prompted the respondents to provide specific responses to gain an understanding of the multidisciplinary staff's perceptions and beliefs about the ICP.

3.9. Setting

3.9.1. Introduction

Two research sites (a treatment and a comparison site) provided the setting for the study. An overview of the treatment and comparison site follows.

3.9.2. Overall picture

Health care within the UK is predominately provided by the National Health Service (NHS). NHS Hospital Trusts are one element of the acute sector of the overall NHS service and generally provide acute in-patient care. The research setting for this study was an NHS Teaching Hospital Trust that served a large city within the United Kingdom. At the time of the data collection, the city had a population of approximately 530,000 people, and was one of the largest cities in the UK. The Trust was one of the largest in England providing a range of acute patient services and employs about 14,000 staff. The Trust primarily serves the local population but also acts as a centre of referral from smaller district general hospitals. Due to the Trust being a Teaching Hospital, the management structure fully supported multidisciplinary developments and research activity. The Trust was managed through Directorates, with the speciality of Gynaecology being managed within the larger Directorate of Obstetrics, Gynaecology and Neonatology. The speciality of Gynaecology employed 15 Gynaecology Consultants, 120 nursing staff, and had support from social services and allied health professionals as and when required. All the clinical staff only worked on one of the two sites thereby removing the issue of cross contamination. The directorate had accommodation for 88 in-patient beds and two outpatient departments. The gynaecology service was delivered on two hospital sites that were situated within five miles of one another, but still within the same city. The two sites were managed collectively and, therefore, followed the same policies and procedures. Care delivery was assumed to be similar between the two sites as they both offered similar services, procedures, treatments, pre-operative assessment clinics, visiting arrangements, and follow up care. Staffing levels, referral pathways, waiting lists, and admission times were comparable between the two sites. Surgeon theatre lists were also comparable (considering type of operation and time available) as were incident rates (information obtained from the central risk register). Referral to either of the sites was through the patients' General Practitioner (GP) and, therefore, it was assumed that accessibility for the patient and carer was comparable. The two hospital sites each had a ward that was primarily dedicated to major gynaecological surgery, allowing for a 'treatment' ward and a 'comparison' ward to be designated for the purposes of this research study. Ward one (site one) was based at hospital site A (the treatment site), and ward two (site two) was based at hospital site B (the comparison site).

The delivery of gynaecology services at the research setting was under re-organisation as the two hospital sites were to be merged into one new, larger site in February 2001. One of the main differences in developments across the sites was the introduction of ICPs. Debbage (1997) had developed and introduced ICPs on site one, whereas site two had continued to use traditional methods of care delivery. Recommending which method of care planning and care delivery resulted in the most positive patient, staff and system outcomes whilst maintaining resources was advantageous. Prior to the research study there was no evidence to indicate whether the use of ICPs on site one resulted in any differences in patient, provider or system (health care) outcomes. This local research study would potentially determine the better method of future care delivery.

3.9.2.1. Treatment group

Site one (based at hospital site A) was designated the treatment site. ICPs had been developed and introduced at this site for a number of procedures, treatments and operations since 1996. Site one was a 28 bed gynaecology ward that provided care for women requiring major surgery e.g. hysterectomy, prolapsed bladder repairs. As outlined in chapter three, ICPs had been developed from 1996 on a range of minor procedures, treatments and operations. An action research project, led by myself, supported the development and piloting of an abdominal hysterectomy ICP. The abdominal hysterectomy ICP formed the basis of the major abdominal surgery ICP that is of interest for this study.

3.9.2.2. Comparison group

Site two (based at hospital site B) had continued to use traditional methods of patient care planning and delivery and, therefore, was designated as the comparison site. The traditional methods of patient care planning and delivery supported disciplines (e.g. nurses, doctors, therapists) planning, documenting and delivering care separately. Site two was a 26-bedded gynaecology ward that provided care for women requiring similar major surgery to site one.

3.9.3. Implementation of the treatment (independent) variable (ICP)

The multidisciplinary team on the treatment site had an understanding and appreciation of the use of ICPs because of their history in using ICPs for other procedures and treatments. A 'Total Abdominal Hysterectomy ICP' had been developed and subsequently introduced in 1998 supported by an action research study (Debbage, 1997). The 1997 action research study was the foundation for the development and implementation of the 'major abdominal surgery' ICP.

3.9.4. Staff training

I provided update training to all staff on the treatment site, as ICPs were not a new concept. Seven, one hour drop in sessions were made available for any staff member to attend. The update training was not compulsory for all staff who had been working on the site; however, all new members of staff were given individual tutorials on ICPs. No specific training sessions were provided to the ward staff on the comparison site. Specific training was given to the pre-operative nursing staff in the form of a short presentation of the study. The presentation was to support the recruitment of potential research subjects and is discussed in further detail within the recruitment section of this chapter. Additionally I offered on-going support and advice to staff on both sites in the form of informal visits throughout the data collection period. All staff were able to telephone me directly regarding any questions surrounding the research study or on the ICP and traditional methods of care delivery. When I was unavailable, the Clinical Nurse Manager for gynaecology was available for advice and support on the ICP and traditional methods of care delivery. The Clinical Nurse Manager for gynaecology and myself had an in-depth knowledge and understanding of the project, as we had both been involved in ICP development in the study area for the previous three years. An audit of nursing documentation occurred on both of the sites in June 2000, which resulted in an action plan on areas for improvement in record keeping on both sites.

3.10. Sample

3.10.1. Introduction

To answer the three research questions data were collected from patients and staff. Questions one and two used the patient sample whereas question three used the staff sample. A description of the patient and staff samples follows.

3.10.2. Patient sample

The study focused on testing the effect of an ICP for women having major gynaecological surgery. 'Gynaecology' is derived from a Greek word meaning 'woman', literally meaning the study of women. In medicine it focuses on the diagnosis, treatment and care of women experiencing disorders of the reproductive organs and pelvis (McQueen, 1997). Gynaecology is frequently depicted as being concerned with younger women, who are relatively healthy, and as a result tend to recover fairly quickly in response to treatment (Gould, 1983; Webb, 1985). Gynaecology patients are, therefore, a homogenous group and are ideal for developing an ICP, as their outcomes should be relatively predictable (Johnson, 1997).

A common procedure undertaken within gynaecology is a hysterectomy. A hysterectomy is the removal of the uterus undertaken either abdominally or vaginally. During 1997 and 1998 over 55,000 hysterectomies were performed in England within the NHS, with the average patient age being between 35 to 45 years. In the UK, a hysterectomy is the fifth most common surgical procedure, with one in five women between the age of 20 and 80 years requiring one (Moreira, 2000). Due to the homogeneity of the population, the large numbers of hysterectomies performed and the fact that an ICP had been developed and required testing, women undergoing a hysterectomy were thought to be an appropriate homogenous group to study.

As previously acknowledged, the two sites were of interest due to the impending merger; no similar sites existed. A review of the two sites' previous year's surgical data confirmed that 422 abdominal hysterectomies were performed. No other research requiring the participation of the sample was being conducted at the time of the study, and therefore recruitment and retention of the subjects was not identified as a potential problem.

3.10.2.1. Patient sample size

The deciding factor in determining an adequate sample size for quasi-experimental research is power (Burns and Grove, 2005). Power is the ability of the study to detect differences (that actually exist) in the population. Having low statistical power increases the probability of accepting a null hypothesis concluding that there is no significant difference between samples when actually the null hypothesis is false (Type II error). Incorrectly concluding that difference exists when it does not is another serious concern (Type I error). As the risk of a Type I error decreases (by setting a more rigid level of significance), the risk of a Type II error increases. When the risk of a Type II error is decreased (by setting a less extreme level of significance), the risk of a Type I error increases. It is not possible to decrease both types of error simultaneously without a corresponding increase in sample size (Burns and Grove, 2005). Therefore, consideration was given to which error type posed the greatest threat to the study results prior to setting the power and significance level. Additionally, consideration was given to the type of study, the number of variables, the sensitivity of the measurement tools and the data analysis technique. The minimum acceptable power for a study of this nature is .80 (Burns and Grove, 2005).

The sample size was determined by power analysis. Four parameters are identified for power: level of significance (alpha), sample size, effect size and power (Burns and Grove, 2005). A power of 0.80 and a significance level of alpha ≤ 0.05 was set prior to data collection. To ensure the results were generalisable beyond the study a statistical test of inference was conducted. The effect size is the presence or absence of a phenomenon and an estimated effect size for this study is suggested as medium. The effect size is calculated from the following equation:

$$\delta = (\mu_A - \mu_B) / \sigma$$

which is the difference between means divided by the pooled standard deviation for two conditions; in the present study those conditions were presence of an ICP or absence of an ICP. Turning to the literature where actual differences in length of stay between ICP and non-ICP care was reported the following studies provided relevant figures (Becker et al, 1997; Chang and Lin, 2003; Cohen, 1991; Ghosh et al, 2001; Hwang et al, 2000; Johnson et al, 2000; Muluk et al, 1997) and an average mean difference (excluding one outlier, Mabrey et al, 1997) was 1.18 and the pooled standard deviation was 3.32. Therefore the effect size was 0.36 which, according to Cohen's (1992) criteria is equivalent to a medium effect size. Therefore, applying Cohen's criteria the sample size required for a difference between means is 64 subjects per site, or a total of 128 research subjects (using tables in Cohen (1987). The power analysis for the multiple regression model resulted in a required sample of 114 (Tabachnick and

Fidell, 2001). The actual numbers of recruited subjects are reported in the results chapter, five.

3.10.2.2. Inclusion and exclusion criteria

The research subjects were not randomly assigned to either the treatment or comparison group due to the referral pathways to the two sites. In an attempt to ensure equivalence of the two sites and to limit the effect of the extraneous variables the sample population was narrowed by applying inclusion and exclusion criteria, allowing maximum effect of the independent variable and minimum effect of variation or other variables.

Subjects, all female, were included in the study if they were willing and able to participate and give informed consent, attending a gynaecology pre-operative assessment clinic, able to speak and read English and required major non-malignant gynaecological surgery. Subjects were excluded from the study if they were unwilling to participate, unable to give informed consent, unable to speak and read English, had a malignancy either before surgery or a malignancy was identified following surgery, or they had a co-morbidity score greater than one. Throughout the literature it is well documented that co-morbidity directly influences an individuals' well being, with the major causes of co-morbidity being medical rather than surgical (Boyd and Groome, 1993). The co-morbidity index developed by Charlson et al. (1987) was used. The index provides a prognostic taxonomy for co-morbid conditions that singly or in combination might alter the risk of short-term mortality for patients. Charlson et al. (1987) state that eliminating patients with co-morbid conditions from studies increases the efficiency of a trail. A co-morbidity score was obtained pre-operatively on each potential research subject, and subsequently used to disqualify those who had a score of greater than one (see Appendix 14 for index). Obtaining the co-morbidity score and removing research subjects that scored greater than one was necessary to strengthen group equivalence and decrease the effect of co-morbidity as a covariate in the analysis that could influence patient outcomes such as length of stay or complications. An analysis of covariance was not necessary as no difference was seen between groups in co-morbidity.

3.10.2.3. Recruitment and consent

Members of both the treatment and comparison groups underwent identical recruitment procedures. Full ethical approval was gained from the joint local ethics committee (Appendix 15) in April 2000 prior to recruitment of any research subjects. Additionally, complete support was gained from the senior nurse managers, medical directors and risk management teams on both the treatment and comparison site to approach patients and staff (Appendix 16). In obtaining full ethics approval great care was taken to protect the rights of those individuals taking part in the study.

The recruitment of the research subjects commenced at the pre-operative assessment clinic. I made contact with the pre-operative assessment nursing team on both sites on a weekly basis to identify potential research subjects to the study for the following week i.e. those women attending for major abdominal surgery. Occasionally the pre-operative assessment clinics ran simultaneously on the two sites (making recruitment difficult due to there only being one data collector). Advanced planning by myself and the pre-operative assessment nursing team allowed potential research subjects to be given appointment times that did not coincide with one another. Providing specific appointment times to the potential research subjects ensured I could travel between the two sites and be available for all recruitment activity.

All the nursing staff working in the pre-operative assessment clinic were given a short presentation of the study with the opportunity to ask any questions. The aim of the presentation was to provide the pre-operative nursing staff with a clear understanding of the research study. The pre-operative nursing staff could then use the presentation information along with a checklist summarising the inclusion and exclusion criteria (Appendix 17) before approaching potential research subjects to participate in the study. An information sheet outlining the rationale for the research and the methods used was given to potential research subjects to read (Appendix 18). An opportunity for the research subject to ask the pre-operative nursing staff any questions was also provided. The pre-operative nursing staff member asked the potential research subject whether or not they were willing to participate in the study. The rationale for having the pre-operative assessment nurse provide preliminary information and invite the potential research subject to participate in the study was to protect the individual's right to decide. Individuals should have a right to decide voluntarily whether to participate in a study, without study participation affecting their treatment or care and thus should feel free of coercion.

Once the research subject had verbally agreed to participate in the study I approached them to obtain written consent. The standard consent form issued by the local research ethics committee was used to obtain the research subjects written consent (Appendix 19). Written consent involved providing the research subject with written information about the study (in a manner in which was understandable), providing an opportunity for the research subject to ask any questions about the study and by explicitly explaining to the research subject that they could withdraw from the study at any time without their on-going care being affected. It was also explained to the research subjects that their involvement in the study would remain confidential to myself and only aggregated results would be shared more widely, therefore protecting their anonymity. The written information provided to the research subjects included a clear statement of the research rationale and a method employed and was produced following guidelines from the Local Ethics Committee. Additionally the research subjects were verbally advised of the data collection instruments that would be used during the study (an expectation, experience of nursing care and satisfaction with nursing care questionnaire, a perception of their health questionnaire and a review of their clinical notes after they have been discharged home for information surrounding their in patient episode). On each contact with the research subjects I confirmed that they had the right to change their mind about remaining a participant in the study. However, no research subjects withdrew from the study. The newly recruited research subjects' data were recorded on a data sheet (Appendix 20) to allow me to monitor their movement i.e. from the pre-operative assessment clinic, admission to hospital, discharge home and finally to their follow up clinic appointment.

3.10.2.3.1. Ethical considerations

Beneficence (above all, do good) and non-maleficence (above all, do no harm) are probably the most fundamental ethical principles applicable to research (Beauchamp & Childress, 2001). The maxim 'above all, do good, do no harm' is clearly very important in health care research. Patients should be kept free from harm and exploitation, and the costs of the research to the participant should never outweigh the benefits of the research. Polit and Hungler (1997) suggest that this principle should not only apply to physical harm but should also encompass the effect of the patient's psychological well being. Use of the inclusion and exclusion criteria supported this principle. The questioning of patients prior and after surgery could have caused the research subjects increased anxiety and distress. Support was offered by me; however, only one subject raised concerns during the data collection contact times. For this individual the area of concern was around the pre-admission period and her level of anxiety. The expectation questionnaire was not completed in this one instance. I also visited the research subjects once during their inpatient admission.

The principle of justice stipulates that research subjects should receive fair treatment before, during and after participating in a study, and that each individual be afforded their right to privacy. Fair treatment means that the treatment of those patients who decline to participate or who withdraw from the study should not be prejudiced in any way. The pre-operative nursing staff and I were the only staff members to be aware of which patients had declined to participate in the study. The wider multidisciplinary team were unaware of those subjects who declined to take part in the study and therefore treatment could not be affected as their anonymity was maintained. The right to privacy implies that the research be carried out in private (Parahoo, 1997), and this was achieved by completing the questionnaires and reviewing the clinical notes in a private room.

The issue of assessing the cost-benefit ratio of the study was another important issue to consider. The cost benefit ratio was unknown for the study; otherwise, there would have been little point in undertaking the research. Therefore to suppose that the study might lead to improved patient care was sufficient to support the research. A cost-benefit analysis is undertaken in the discussion chapter in relation to improvements in outcomes e.g. length of stay.

3.10.3. Staff sample

Johnson (1997) states that the use of an ICP is related to the experience of the multidisciplinary staff using it to deliver patient care i.e. if the multidisciplinary staff members evaluates the experience positively then the ICP is much more likely to be used appropriately. For the purpose of this research study, the multidisciplinary staff were identified as all the staff involved in the care of a patient during the episode of illness. This included staff from medicine, nursing and allied health professionals e.g. physiotherapists, occupational therapists and social services. Site one had developed and implemented an ICP in 1997 (Debbage, 1997). The multidisciplinary team at the treatment site were therefore familiar with the ICP, however their opinion of the newly developed ICP was still important and useful to obtain. A self returned staff questionnaire formed the only source of data collection for staff. Most of the responses are from closed questions allowing descriptive statistics to be used, the two open ended questions are explored for themes (descriptive exploratory).

3.10.3.1. Staff sample size

A convenience sample of the multidisciplinary staff from site one (total of 47 staff) was posted a questionnaire to determine staff opinions of the abdominal surgery ICP (Appendix 13). The responses were descriptive in nature to gain an understanding of the staff's perceptions of the ICP and to generate some descriptive data e.g. preference of new ICP to traditional methods, usefulness of ICP for teaching, research and audit. The response rate is reported in the following chapter.

3.10.3.2. Inclusion and exclusion criteria

Only the multidisciplinary staff at the treatment site (site one) were included in the staff questionnaire. All staff on site one were sent the questionnaire and therefore no staff were excluded from receiving the questionnaire.

3.10.3.3. Recruitment and consent (including ethical considerations)

As previously highlighted, I worked in the multidisciplinary team included in the study and, therefore, it was important to use a data collection tool that allowed and protected staff anonymity. The clinical management teams (made up of the medical director, director of nursing, risk manager and general manager) from both sites were contacted prior to data collection to obtain support for conducting the study (Appendix 16). Each staff member from site one was posted a questionnaire with a covering note explaining the study, including a statement that by returning the questionnaire, the individual staff member was consenting to participate in the study. All staff were given the opportunity to contact me to ask questions or discuss any aspect of the research study in confidence. Therefore, a returned questionnaire indicated consent to participate.

3.11. Data Collection

I undertook the role of distributing, collecting and analysing all of the data. Each research subject received the same information and instructions for completing the individual data collection tools. Data were collected on the study variables (as defined earlier) using specific valid and reliable instruments.

3.11.1. Researcher's role

I was employed within the speciality of gynaecology at site one as a Registered General Nurse (RGN) in a 'Research/ Audit Nurse' role. I had full access to the patient and staff groups' of interest and was immersed in the routine activities of the gynaecology service. One of my main roles was to develop, implement and evaluate ICPs within gynaecology. The multidisciplinary team from site one had worked with me in the clinical setting for six years prior to the current research study. I had the potential to guide the patients and staffs' opinions of the ICP and the traditional methods of care delivery, as she was the only individual collecting the data. However I did not deliver direct patient care during the data collection period. Additionally, sensitive, reliable and valid instruments were used to collect data reducing the influence I had on the outcome.

3.11.2. Patient data

Data were collected from August 2000 to February 2001 from the patient sample on study variables at two points of time (time one: prior to the surgical procedure and time two: approximately six weeks post operatively). Time one refers to the pre-operative assessment clinic contact and point of recruitment and time two refers to the post-operative follow up clinic contact.

3.11.2.1. Time one – Pre-operative assessment clinic

Data collection commenced at the pre-operative assessment clinic. The research subject's demographic data, characteristics and pre-operative expectation questionnaire were collected at time one. To explore the relationship between expectation and experience of nursing care it was important that expectation was assessed before patients received care to avoid confounding the assessment of experience. The expectation questionnaire was administered at the pre-operative visit, before the patient had visited the ward environment, met the ward nursing staff or other in-patients to help reduce any bias from exposure to the in-patient environment. Additionally relatives, friends and other patients were prevented from assisting in the completion of the individual questionnaires. Individual research subjects were escorted into a quiet room where there were no disturbances. At this point, the research subjects were asked if they needed any help with reading or completing the questionnaire. When difficulties occurred I would read the questions out loud and completed the questionnaire according to the response given e.g. agree a lot. A prompt sheet with the Likert scale was used to assist the research subject to complete the questionnaire accurately (Appendix 21). French (1981) suggests that the place of administration and completion of a questionnaire might influence response rates and scores. All questionnaires were administered directly to the research subject in a private room. Privacy helped to ensure confidentiality was maintained at all times.

3.11.2.2. Time two – Follow up clinic

The research subjects' follow up appointment was obtained from the hospital site administrative system. The follow up appointment was a standard of approximately six weeks post operatively.

The follow up clinics ran throughout the week on both sites, and occasionally (like the pre-operative assessment clinics) the clinic appointments overlapped on both site. On the occasions when there was a research subject on each site (attending their follow up appointment at the same time), I negotiated different appointment times to allow for travel between the two sites. The NSNS and SF-36 questionnaires were administered at the follow up clinic appointment. An identical pattern of administration for the post operative questionnaires to that of the pre-operative questionnaires was undertaken e.g. private room, offer of assistance to complete the questionnaire from myself. The data collection instruments were administered in random order to control for subject fatigue bias.

The patients' case note data (to obtain socio-economic status, reason for surgery, type of incision, operation performed, complications, length of stay, re-admission within 30 days of discharge and reason for re-admission) were collected during free time and when the patient case notes were available at the follow up clinic, usually at around six weeks post discharge.

3.11.2.3. Data collection schedule

The specific days and times for data collection were pre-determined by the research subjects' appointment details. A note was made of the data collection environment, date and time to analyse for bias e.g. noise level. A schedule for data collection was developed and is presented in Table 12.

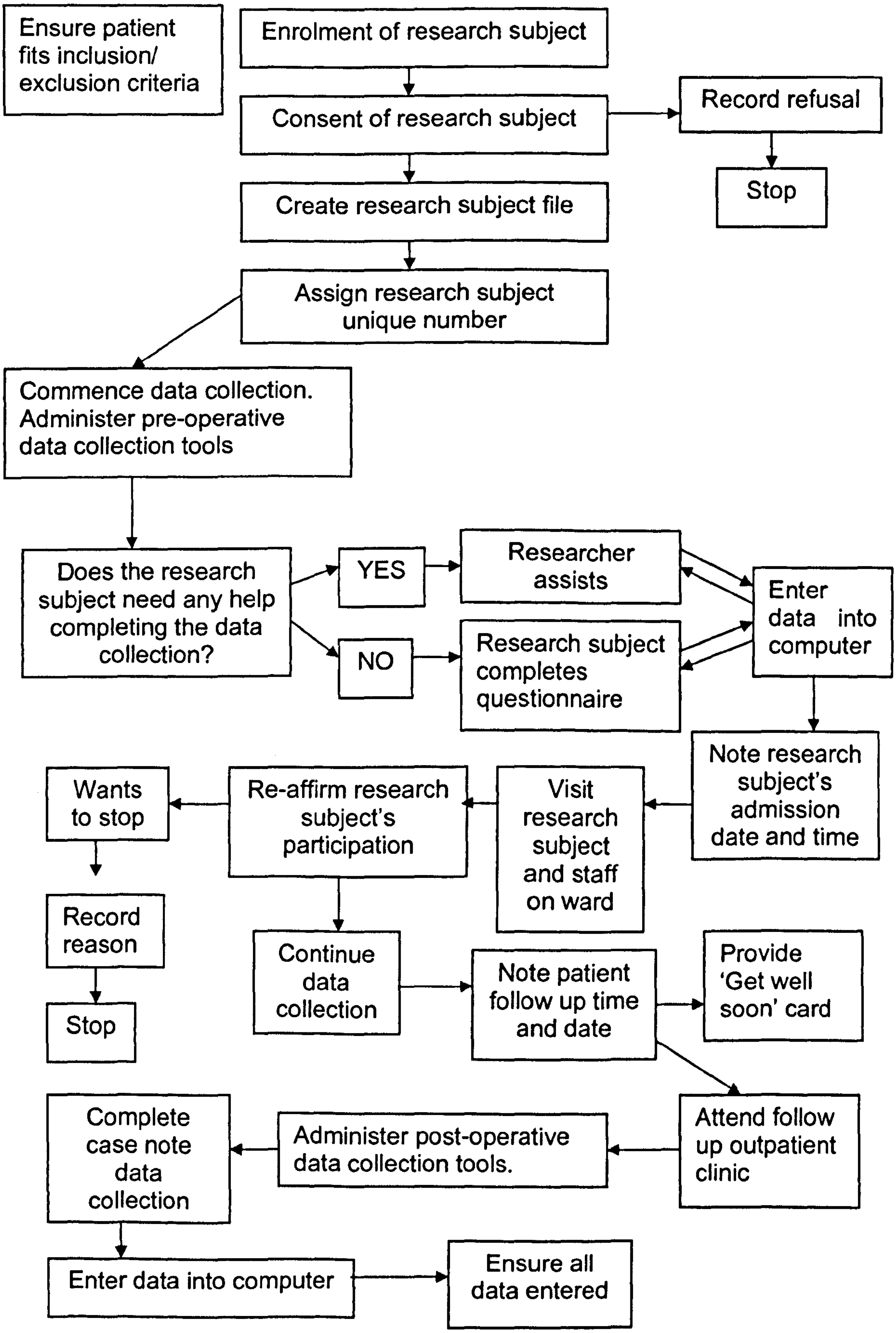
Table 12: Schedule of data collection

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	Ward visits Appointment Case note review	Ward visits Appointment Case note review	Ward visits Appointment Case note review	Ward visits Appointment Case note review	Ward visits Appointment Case note review
PM	Contact Pre-operative nursing staff on treatment site (one). Ward visits Appointment Case note review	Ward visits Appointment Case note review	Ward visits Appointment Case note review	Contact Pre-operative nursing staff on comparison site (two). Ward visits Appointment Case note review	Ward visits Appointment Case note review

I spent approximately two hours collecting data from each research subject. In an attempt to retain patients from time one to time two; an individually written card was used on discharge to remind the research subject of their appointment time and to thank them for their participation in the study (Appendix 22).

I kept a reflective journal to monitor any changes in practice, policy or staffing levels. No significant events occurred during the data collection period. There were no periods when I was absent during the data collection period.

3.11.2.4. Data collection overview



3.11.2.5. Data management

Data collection forms were developed, modified from previous studies or directly transferred from other research. The forms were coded to allow transformation of the information via a computer software package for analysis. A codebook was used to identify and define each variable including any abbreviated variable names and the range of numerical values given to each variable entered into the computer file.

I kept the research subjects' personal details confidential by assigning a unique study ID number to each research subject. A master list of research subjects' personal details and associated study ID numbers were filed in a locked cabinet with only the research having access. The unique study ID code, date and time were recorded on each data collection instrument. All instruments were stored in numerical order in a locked filing cabinet. Storage of computer printouts from data analysis was conducted in a systematic manner, and stored by variables in a time sequential manner in a locked cabinet. No subjects withdrew from the study and therefore the disposal of all the original data forms followed the Hospital Trust, University and Local Ethics committee policy guidelines.

3.11.2.6. Data entry

Data were carefully checked and problems corrected before data entry was initiated. My private office was used for data entry with a recommended maximum of two hours of data entry at any one time (Burns and Grove, 2005). A back up of the database was made after each entry session and stored on a removable disc. This disc was stored in another locked filing cabinet. All the patient data were entered into a computer using the Statistical Package for the Social Science (SPSS). Once all the data had been entered into the computer database cross checks of the data were performed to check for data entry error. The error rate is reported in the results chapter. Frequency analysis of every variable was undertaken as a second check of the accuracy of data.

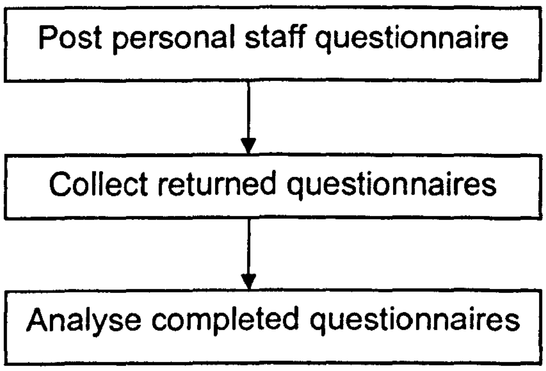
3.11.3. Staff data

The staff questionnaires were distributed and collected from November to December 2000.

3.11.3.1. Data collection schedule

The staff questionnaires were administered by post (through the Trust's internal post system) to every staff member on the treatment site by a personally addressed questionnaire (47 staff members in total). A covering letter detailing the study with a required response date, accompanied each questionnaire (Appendix 13). All staff were given the opportunity to contact me to ask any questions or discuss any aspect of the research study in confidence.

3.11.3.2. Data collection overview



3.11.3.3. Data management

The staff data did not contain individually identifiable information and therefore it was not necessary to use any coding. All the returned questionnaires were stored in a locked cabinet to which I held the only key.

Data were entered into the computer for descriptive analysis. Additionally the data were reviewed for themes from the additional comment section of the questionnaire.

3.12. Data Analysis Procedures

3.12.1. Introduction

This section focuses on the plan of data analysis. Firstly, the plan for patient data analysis is described to answer questions one and two, this is followed by a description of the staff data analysis plan to answer question three. The reliability co-efficients of the specific instruments used for data collection are reported in the results chapter. SPPS was used to perform the statistical analysis on the research subject data.

3.12.2. Patient data

3.12.2.1. Data cleaning

Responses from all the patient questionnaires were entered into SPSS by myself and then double entered by a statistician familiar with the data entry process. Data for each variable were compared across data sets to ensure consistency. Discrepancies were identified and compared to original raw data and where necessary data were corrected for accuracy. In addition frequencies were calculated for every variable.

I entered patient case note data. A double entry of every 10th set of patient case notes was re-entered by me. These data were then compared to the original data to identify any differences. The error rates for both the patient questionnaires and patient case note data are reported in the results chapter.

3.12.2.2. Missing data

All 122 patients recruited to the study completed all aspects of data collection with the exception of one patient who did not complete the expectation questionnaire. Following completion of the patient questionnaires I checked to ensure all sections had been completed. Some of the patient responses were in between categories making it impossible to determine which answer was indicated. In these circumstances the question was counted as missing. The missing responses are reported in the results chapter.

3.12.2.3. Preliminary analysis

Data were initially explored by conducting a descriptive analysis. Frequencies were run for each variable and measures of central tendency and dispersion were examined. Tables and graphs were used to provide a visual display of the data allowing me to identify any patterns in the data and explore any extremes values. Extreme values were re-checked against the original data source to ensure they were not the result of a data entry error. I was solely responsible for data analysis. Consultation with a statistician was sought for support and technical advice. Data were examined for normality and for violation of the assumptions of the specific statistical tests.

Prior to hypotheses testing the patient demographic data and patient characteristics data were analysed to determine whether the two groups were equivalent. A t-test was used to examine group differences on interval level data, and a Chi-square test was used to examine group differences on nominal level data. The t-test was chosen for the interval level data as it tests for significant differences between statistical measures of two sample means and was appropriate. The groups were defined by the treatment (site one) and comparison (site two) sites. Chi-square was used to determine the relationship between two discrete variables and tested whether or not the observed frequencies were different from the expected frequencies (Burns and Grove, 2005). Table 13 provides an overview of the variable, level of measurement and statistical test used to support preliminary analysis.

Table 13: Overview of the variable, level of measurement and statistical test used to support preliminary analysis.

Variable	**Level of measurement**	**Statistical test**
Age	Interval	t-test
Marital status	Nominal	Pearson Chi-square test
Number of dependants	Interval	Pearson Chi-square test
Support on discharge home	Nominal	Pearson Chi-square test
Age left full time education (years)	Interval	t-test
Still in full time education	Nominal	Fisher Exact Chi-square test
Townsend index	Nominal	t-test
Reason for surgery	Nominal	Pearson Chi-square test
Type of Incision	Nominal	Pearson Chi-square test
Operation performed	Nominal	Fisher Exact Chi-square test

Nominal variables that did not have enough data in the categories for analysis were collapsed into fewer categories. Professional knowledge was applied to support the re-grouping of data.

3.12.2.4. Question one

To analyse research question one (what effect does an ICP have on the outcomes of gynaecological patients attending for major abdominal surgery?) ten testable hypotheses were analysed by means of statistical tests appropriate for each level of data. Following, the ten hypotheses are individually represented and the statistical test used for the hypotheses testing is described.

3.12.2.4.1. Hypothesis one:

Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have a statistically significant higher level of expectation of nursing care than to a similar group of patients who receive traditional care.

Hypothesis one was tested using an independent one tailed t-test.

3.12.2.4.2. Hypothesis two:

Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have a statistically significant higher level of experience with nursing care compared with a similar group of patients who receive traditional care.

Hypothesis two was tested using an independent one tailed t-test.

3.12.2.4.3. Hypothesis three:

Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have a statistically significant higher level of satisfaction with nursing care compared with a similar group of patients who receive traditional care.

Hypothesis three was tested using an independent one tailed t-test.

3.12.2.4.4. Hypothesis four:

For gynaecology patients undergoing major abdominal surgery who have care administered using an ICP, there will be no statistically significant differences between expectation of nursing care and experience of nursing care.

Hypothesis four was tested using an independent two-tailed t-test.

3.12.2.4.5. Hypothesis five:

For gynaecology patients undergoing major abdominal surgery who receive traditional care, there will be no statistically significant differences between expectation of nursing care and experience of nursing care.
Hypothesis five was tested using an independent two-tailed t-test

3.12.2.4.6. Hypothesis six:

Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have a statistically significantly higher opinion of their own physical health post-operatively compared with a similar group of patients who receive traditional care.
Hypothesis six was tested using an independent one tailed t-test.

3.12.2.4.7. Hypothesis seven:

Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have a statistically significantly higher opinion of their own mental health post-operatively compared with a similar group of patients who receive traditional care.
Hypothesis seven was tested using an independent one tailed t-test.

3.12.2.4.8. Hypothesis eight

Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have statistically significantly lower complications compared with a similar group of patients who receive traditional care.
Hypothesis eight was tested using a Chi-square test.

3.12.2.4.9. Hypothesis nine

Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have a statistically significantly shorter length of stay compared with a similar group of patients who receive traditional care.
Hypothesis nine was tested using an independent one-tailed t-test

3.12.2.4.10. Hypothesis ten

Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have statistically significantly fewer re-admissions to hospital within 30 days of discharge compared with a similar group of patients who receive traditional care.
Hypothesis ten was tested using a Chi-square test.

The level of measurement consisted of nominal and interval level data. The level of data determined the choice of statistical test to be performed. Table 14 summarises the patient characteristic and outcome variables on which data were collected and the statistical test employed for analysis and hypothesis testing.

Table 14: Patient characteristic and outcome variables, level of measurement and statistical test used.

Variable	Level of measurement	Statistical test
Expectation of nursing care	Interval	t-test
ICP	Nominal	Chi-square
Experience of nursing care	Interval	t-test
Satisfaction with nursing care	Interval	t-test
SF-36 Physical	Interval	t-test
SF-36 Mental	Interval	t-test
Complications presence	Nominal	Chi-square
Length of stay (days)	Interval	t-test
Re-admission	Nominal	Chi-square
Reason for re-admission	Nominal	Chi-square

3.12.2.4.11. Statistical tests and underlying assumptions

The t-test and Chi-square test have underlying assumptions that must be met. These assumptions are described. Preparation for analysis involved assessment of the underlying assumptions and this is reported in the results chapter.

3.12.2.4.11.1. T-test (independent samples)

The t-test uses the standard deviation of the sample to estimate the standard error of the sampling distribution (Polit and Hungler, 1997). The assumptions for a t-test include: the sample means are normally distributed, the dependent variable is measured at the interval level, there is equal variance in the two samples and there is independence of all observations within each sample (Burns and Grove, 2005).

3.12.2.4.11.2. Chi-square test (Pearson and Fisher exact)

The Chi-square test is designed to compare expected frequencies with observed frequencies for data that are independent of one another and at the nominal level of measurement (Polit and Hungler, 1997). The assumption for the Chi-square test requires independence for each category of a variable (Burns and Grove, 2005). Where the expected value of the cell is less than 5 a Fisher exact test is used (Sim and Wright, 2000) due to the small sample size.

3.12.2.5. Question two

To analyse research question two (what factors including the use of an ICP contribute to the variance in length of stay for gynaecological patients) a theoretical model was developed and tested. Factors included in the model consisted of those variables derived from the literature and from professional expert experience that were thought to influence length of stay, variables that were significantly correlated with length of stay, as well as variables that demonstrated significant differences between the group that received care based on the ICP and those that received traditional methods of care.

A descriptive correlation design and multivariate analysis, using hierarchical multiple regression and path analysis was undertaken to detect the relative strength of factors, in addition to the ICP, that might also explain the variance in patient length of stay, the dependent variable.

3.12.2.5.1. Theoretical model

Refer to Figure 3 (page 78) for an overview of the theoretical model. Path analysis is a useful method for building and testing theory in nursing (Munro and Page, 2001). Path analysis answers questions regarding the relationship between a set of independent and dependent variables (Norris, 2001). Asher (1983) argues that path analysis allows a richer understanding of the phenomena. It is argued that improved patient outcomes should lead to a decreased length in hospital stay. Length of stay therefore was identified as the dependent variable of interest.

3.12.2.5.1.1. Specifying the model

The variables included in the model to predict length of stay, the dependent variable, were selected based on the following rationale. First, those variables that demonstrated a statistically significant difference between the treatment group and the comparison group were included. Additional variables included in the model were those variables that demonstrated a significant correlation with length of stay and those variables that I selected based on expert knowledge of nursing practice. Thus, the model comprised the following variables: the ICP itself as the treatment variable, patient demographics and characteristics of age, the Townsend index referencing social deprivation and health, the reason for surgery, presence of complications, perception of physical health status and perception of mental health status referenced by SF-36 physical and mental aggregated scores, and experience of nursing care. Experience of nursing care was selected to represent the best indicator of the three variables, expectation of nursing care, experience of nursing care and satisfaction with nursing care to prevent the violation of the multicoliniarity assumption of multiple regression. The nine variables Age (X_1), Townsend index (X_2), ICP/ Site (X_3), Reason for surgery (X_4), Presence of complications (X_5), SF-36 aggregated physical score (X_6), SF-36 aggregated psychological score (X_7), Experience of nursing care (X_8), and Length of stay (X_9), were temporally ordered and included in the four stage model.

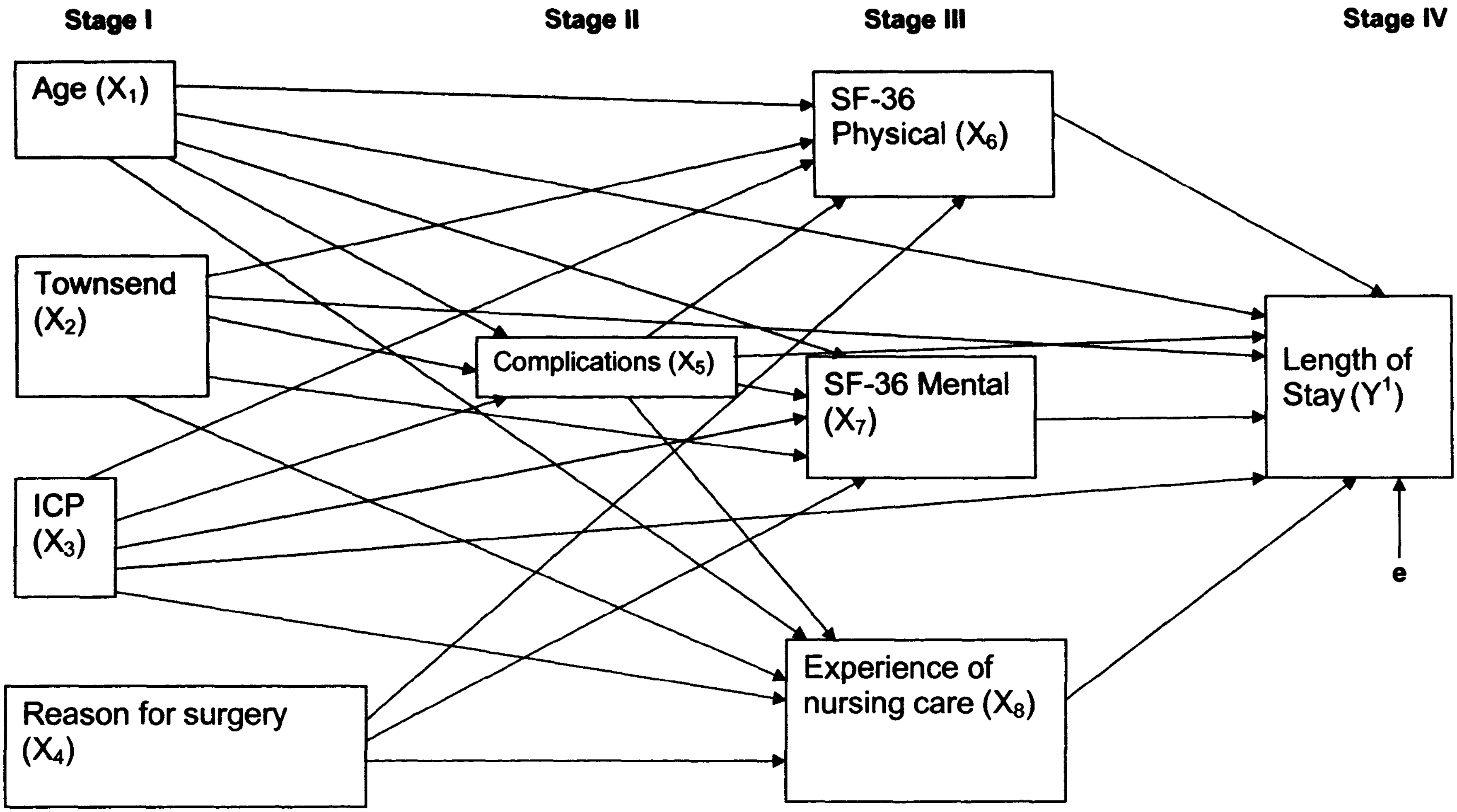
The next step is hypothesising the relationship between the variables in the model and the direction of the relationship. The proposed model flows in one direction; thus the model is recursive (Tabachnick and Fidell, 2001). The arrows leading from one variable to another constitute a hypothesised linkage. Linkages were omitted for those variables for which no relationship was thought to exist. The model (Figure 5) takes into account the characteristics that were thought to influence the other variables. Specifically the demographic characteristics (age and Townsend index) were expected directly and in-directly to influence the length of stay outcome, and the use of an ICP was also expected to directly and indirectly influence the length of stay outcome.

The variables in the first stage of the model are exogenous. These variables are not influenced by other variables in the model. All other variables are endogenous and therefore expected to influence or be influenced by other variables.

Independent variables (both endogenous and exogenous) may have either a direct or indirect influence on the dependent or outcome variable. Direct effects depict the strength of a relationship between an independent variable and an outcome or dependent variable such as length of stay. The variance contributed by other variables is controlled in analytical procedures pre-determined by myself and dictated by the theoretical model. Indirect effects represent those effects that occur when the independent variable influences other endogenous variables in the model at stages prior to the dependent variable.

Arrows leading from one variable to another represent hypothesised linkages or paths. Linkages were omitted in the absence of a theorised relationship. All Stage I, Stage II and Stage III variables were hypothesised to have a direct or indirect influence on the Stage IV variable, length of stay.

Figure 5: Temporarily ordered theoretical model (with directional relationship of variables)



$$Y^1 = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta B_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + e$$

3.12.2.5.1.1.1. Stage I

Stage I of the model contains four exogenous variables; Age (X_1), Social deprivation as measured by the Townsend index (X_2), the ICP (X_3), and the Reason for Surgery (X_4). Age (X_1), Townsend index (X_2), and the ICP (X_3) are expected to have a direct influence on the presence of complications (X_5), the single Stage II variable. Age, Townsend index, the ICP and Reason for surgery (X_4), were also expected to demonstrate a direct influence on each of the stage 3 variables, SF-36 aggregated physical Score (X_6), SF-36 aggregated mental Score (X_7), and Experience of nursing care (X_8). Age, Townsend index and the ICP, Stage I variables, were also expected to directly influence Length of Stay (X_9) at Stage IV.

In addition, several indirect effects were predicted. Age (X_1), Townsend index (X_2), and the use of an ICP (X_3) at Stage I were predicted to have an indirect influence on each of the Stage III variables by means of indirect paths through Complications (X_5) at Stage II. In addition all of the Stage I variables were predicted to have an indirect effect on Length of stay (X_9) through each of the variables at Stage III (SF-36 aggregated physical Score (X_6), SF-36 aggregated mental Score (X_7), and the Experience of nursing care (X_8).

3.12.2.5.1.1.2. Stage II

Stage II is represented by the single variable, Complications. Complications (X_5) are expected to demonstrate a direct effect on the three Stage III variables and the dependent variable length of stay (X_9), at Stage IV. Complications may also have an influence on Length of stay indirectly through the three Stage III variables.

3.12.2.5.1.1.3. Stage III

Stage III is represented by three variables: SF-36 aggregated physical Score (X_6), and SF-36 aggregated mental Score (X_7), and Experience of Nursing care (X_8). Although physical and mental health status were measured following discharge, it was reasonable to place these two variables at Stage III because the concept, measured by the SF-36 aggregated physical Score (X_6), and SF-

36 aggregated mental Score (X_7) referenced the postoperative experience that commenced immediately following surgery.

3.12.2.5.2. Statistical test and underlying assumptions

Following specification of the model, hierarchical multiple regressions was conducted to test each path and stage of the model and determine the relative strength of association of each variable with the dependent variable Length of Stay.

Preparation for analysis involved assessment of the assumptions underlying the use of multiple regression. The assumptions of multiple regression analysis include: an adequate ratio of cases to independent variables; absence of outliers in the data; variables that can be treated as interval level data; variables that are measured without error; absence of multicolinearity among independent variables; normality, linearity and homoscedasticity, residuals are not correlated, and different scores are random and have homogeneous variance (Tabachnick and Fidell, 2001). The final assumptions are tested by means of residual analysis.

3.12.3. Staff data

3.12.3.1. Missing data

To maintain anonymity, staff were not re-contactable to complete any missing data from the staff questionnaire. Missing data are reported in the results chapter.

3.12.3.2. Question three

To analyse research question three (what are the opinions of the multidisciplinary staff who have used the ICP of the ICP itself?) staff satisfaction questionnaires were analysed using descriptive statistics. The literature suggests that the staff's ability to embrace an ICP has a direct influence on ICP success (Herring, 1999 and Johnson, 1997). An exploratory descriptive design was used to study the opinions and beliefs of staff that used the ICP. Responses by profession and grade are reported in the results chapter. The data were studied descriptively and reviewed for themes. The questions and statements within the staff questionnaire were analysed individually and themes were identified from the open questions. The questionnaire also provided the opportunity for inter-group comparisons i.e. between medical staff, nursing staff and allied health staff.

3.13. Conclusion

This chapter focused on the research methods. An overview of the research problem was presented with three specific research questions. The research design employed to answer the three questions followed. Specific hypotheses were developed to test the research questions and variables associated with each hypothesis were conceptually and operationally defined. Threats to internal validity and methods used to control identified threats were given at this stage.

A description of the study setting and sample, including size and recruitment criteria followed. Recruitment of research subjects including ethical considerations was described.

The data collection methods for the three questions were presented followed by a description of the data analysis procedures and specific statistical analysis methods. The underlying assumptions for the data analysis procedures were presented. The results of the analysis will be reported in the results chapter.

4. Chapter Four: Results

4.1. Introduction

This chapter will present the results of the data analysis. Preliminary analysis regarding the data entry error rate, response rates, underlying assumptions of the statistical tests, sample distribution, reliability of instruments and group equivalence are described. These results are presented in order of the three research questions.

4.2. Preliminary analyses

4.2.1. Patient data (research question one and two)

4.2.1.1. Data entry error results

Data entry errors were random throughout the dataset. No identifiable pattern of errors was evident, and errors did not significantly threaten the results. Data were double entered and comparisons across the datasets resulted in only four errors i.e. four questionnaires did not have identical data to the comparison dataset. Data cleaning resulted in 99.9% accuracy within questionnaires that were identical on both the original database and the comparison files.

4.2.1.1.1. Patient expectation of nursing care questionnaire

Error rate as a proportion of total key strokes was 0.3% (9/(122x24)). The error rate was calculated by multiplying the number of completed questionnaires (122) by the number of questions in the questionnaire (24) and then dividing this figure by the total number of errors for the dataset (i.e. the differences between the original database and the comparison files) in this case 9.

4.2.1.1.2. Patient experience of nursing care and satisfaction with nursing care questionnaire

The accuracy was 99.9% as four responses were not identical in the original database and the comparison files. The total error rate was 0.1% (4/(122x26)), which was calculated using the same formula as the expectation questionnaires.

4.2.1.1.3. SF-36 questionnaire

A systematic error was identified for the entire data entry for the SF-36 questionnaire. Data were entered in two ways, one in which the data were entered in the original format and then converted into the final score using a syntax file and the other in which the data were converted at entry for each item. A systematic error resulted for one question due to it being converted incorrectly during data entry. All of the incorrectly entered items were corrected prior to analysis. No other errors were found from matching the original dataset with the comparison files for the SF-36 questionnaire.

4.2.1.1.4. Case note review

Every tenth set of case notes was re-checked. The two sets of data were compared resulting in an error rate of 0.007 (calculated on the same formula as the other data collection instruments). The discrepancies were reviewed against the case notes to obtain the accurate data.

4.2.1.2. Response rates

Sixty five patients from the treatment site and 67 patients from the comparison site were approached to take part in the study. A total of 122 (61 from each site) agreed to participate in the study. No data were collected from patients who refused to participate in the study. Power of 0.79 was achieved based on the number of research subjects recruited for the study. Power of 0.79 is slightly less than desired (0.80) causing an increased risk of a type II error, and this is considered in the discussion chapter along with rationale of why more patient were not recruited to the study.

4.2.1.2.1. Patient expectation of nursing care questionnaire

Only one individual did not complete the expectation questionnaire with the rationale of feeling too stressed about the forthcoming procedure to concentrate on the questions. In total, 121 cases of expectation data were recorded. Reliability was re-estimated with the study population and resulted in a standardized Cronbach's alpha of 0.80. Reliability was considered acceptable for an immature or revised scale (Burns and Grove, 2005). Inter-item correlations ranged from -0.29 to 0.63 with a mean inter-item correlation of 0.14.

Item to total correlations ranged from 0.03 to 0.49. These findings indicate acceptable item internal consistency and scale reliability.

4.2.1.2.2. Patient experience of nursing care and satisfaction with nursing care questionnaire

A total of 110 experience of nursing care and 110 satisfaction with nursing care questionnaires were available for analysis; 55 from the treatment site and 55 from the comparison site. Eleven questionnaires were excluded from analysis based on a listwise deletion of cases due to missing items. The number of missing items that resulted in a listwise deletion was determined by recommendations regarding the specific instrument (Thomas et al., 1996). The level of missing data was relatively low, ranging from 8 – 11% of questionnaires not being completed sufficiently to produce a final score. Missing data were evenly distributed between the two sites and did not appear to cluster around any independent variables e.g. age, Townsend index, living arrangements or length of stay. Therefore, no important differences between those attending the treatment site and the comparison site were found related to response rates.

The inter-item correlations for the Experience of Nursing Care questionnaire ranged from -0.62 to 0.72 indicating that there may have been some item redundancy. The mean inter-item correlation was 0.19. Item to total scale correlations ranged from -0.42 to 0.77. Reliability was re-estimated with the study population and resulted in a standardized Cronbach's alpha of 0.86 indicating good internal consistency reliability.

For satisfaction with nursing care, the inter-item correlations ranged from 0.39 to 0.86 with a mean inter-item correlation of 0.67. Item to total correlations ranged from 0.56 to 0.88. Reliability was re-estimated with the study population and resulted in a standardized Cronbach's alpha of 0.98. All items were re-coded into the same direction before Cronbach's alpha was calculated. The inflated alpha may have been attributed to item redundancy as evidenced by the high inter-item correlation. Both the experience of nursing care and the satisfaction with nursing care questionnaire findings indicate acceptable item internal consistency and scale reliability.

4.2.1.2.3. SF-36 questionnaire

The data available for analysis were contained in 110 completed questionnaires. The unavailability of the additional 12 questionnaires was due to incomplete sections of the scale, and therefore, inappropriate data for final score calculations. As with the experience of nursing care and satisfaction with nursing care questionnaires the missing data were randomly distributed across the two sites and therefore should not have affected the overall results.

4.2.1.2.4. Case note review

All data from the 122 case notes were available for analysis.

4.2.2. Staff data

No error was identified in the staff data entry. Fourteen out of a possible 47 staff completed and returned the questionnaires resulting in a moderately low response rate (30%). Staff were reminded to complete and return the questionnaire by an e-mail to all staff and a poster in the staff rooms. The questionnaires were fully completed by all 14 respondents and therefore could all be used for analysis.

4.2.3. Testing the underlying assumptions of the t-test and Chi-square test

Preparation for analysis of the first research question involved assessment of the underlying assumptions for a t-test and Chi square test. The underlying assumptions for the t-test and Chi-square test were presented in the methods chapter and the results of those assessments follow.

4.2.3.1. t-test (independent samples)

Patient's age, the age the patient left full time education, the patients' Townsend index, expectation of nursing care, experience of nursing care, satisfaction with nursing care, return to health (SF-36) and length of stay data sets were all analysed using a t-test. A one tailed t-test was used for analysing directional hypotheses and a standard two-tailed t-test used for other hypotheses. Data were normally distributed for all the variables and met the underlying assumptions of a t-test. Experience of nursing care was slightly negatively skewed and length of stay was slightly positively skewed. Both skews were only approximate and therefore should not have influenced the test. Data were examined for normality by observing the skew and kurtosis using graphs and numerical information, including mean and median comparisons, and observing frequency tables. Data were considered to be normally distributed if the skew divided by the standard error of the skew was equal to or less than 2 (Argyrous, 2000). Similarly, data were considered to be normal if the kurtosis divided by the standard error of the kurtosis was also equal to or less than 2. The dependent variable was measured at interval level through the use of an appropriate, reliable and valid instrument. Equal variance in the two samples was observed as calculated by the Levene test resulting in a non significant difference (at >.05). Independence of all the observations was achieved as the treatment and comparison site were mutually exclusive.

4.2.3.2. Chi-square test (Pearson and Fisher's exact)

Patient's marital status, number of dependants, support on discharge home, still in full time education, reason for surgery, type of incision, operation performed, presence of complications, re-admission and reason for re-admission were all analysed using a chi-square test. Because Chi-square is a non parametric test, it is distribution free and has fewer constraints in underlying assumptions. The sample size was adequate; there was a sound theoretical basis for the categorisation of variables and data were frequency data. Measures of independence for each category of a variable was achieved by ensuring that the categories for each variable were mutually exclusive. Where the expected value of the cell was less than 5, a Fisher exact test was used (Munro and Page, 2001).

The underlying assumptions for conducting all of the statistical tests were met prior to data analysis. Findings were considered statistically significant if the p value was equal to or less than 0.05. To protect further against a type I error (due to the using multiple tests on the same population) a Bonferroni correction test (Bryman and Cramer, 1997) was undertaken. The level of significance (0.05) was divided by the number of comparisons being made i.e. three t-tests were undertaken when analysing the demographic and characteristic data resulting in a significance level of 0.017 (0.05 divided by 3). The Bonferroni test was repeated when multiple tests were undertaken and is reported with each set of results.

4.2.4. Patient demographic and characteristic data

An overall review of the patients characteristics including demographic details are given in Tables 15 and 16.

Table 15: Interval level patient demographic variables

Characteristic	Mean	SD	Range	Median	Skew	Kurtosis
Age (years)	44.17	8.86	30 to 79	42.69	0.22	0.44
Townsend index (social deprivation score)	-0.54	-3.56	-7.36 to 5.70	-1.12	-0.16	0.44
Age left full time education (years)	17.3	4.50	14 to 18	16	0.29	0.44

Table 16: Nominal level patient demographic variables

Marital status	**Single (%)**	**Living with significant other (%)**	
	28 (23%)	94 (77%)	
Number of dependants	**None (%)**	**One or more (%)**	
	63 (52%)	59 (48%)	
Support on discharge home	**None / Some (%)**	**Great deal (%)**	
	12 (9%)	110 (91%)	
Still in full time education	**Yes (%)**	**No (%)**	
	3 (2%)	119 (98%)	
Reason for surgery	**Menorrhagia**	**Fibroids**	**Other**
	55 (45%)	33 (27%)	34 (28%)

The sample ranged in age from 30 to 79 years with a mean age of approximately 44 years. The overall average Townsend index was -0.54 (SD - 3.56) equating to an average deprivation level. Most subjects completed full time education by the age of 17 years, however a few (n = 3) were still in full time education at the time of the surgery. The majority (n = 94) lived with a significant other and, therefore, had support on discharge. There was nearly an equal split between those who had dependants (n = 59; 48%) and those who did not (n = 63; 52%). Menorrhagia accounted for 45% (n = 55) of the reason for the surgery, with fibroids accounting for 27% (n = 33) and other for the remaining cases (28%; n = 34).

4.2.4.1. Pre-test of group equivalence

Comparisons between the two groups on each patient demographic and patient characteristic variable were compared to examine the equivalence of the two study groups. The final results of these comparisons are presented in Table 17 for age, social deprivation score (Townsend index), marital status, number of dependants, support on discharge home, age left full time education, reason for surgery, type of incision and operation performed. Interval level data underwent group comparisons by using a t-test. Nominal data were tested using a chi-square test. For the age variable one outlier was identified. This outlier was not removed from the final analysis as this individual did not differ from the other research subjects on all the other variables and was therefore thought to be representative of the population under study.

Table 17: Patient demographic and characteristics data

Characteristic	Treatment site n = 61	Comparison site n = 61	df	Test	p	CI at 95%
Age (years):						
Mean (SD)	41.73 (7.01)	46.60 (9.86)	120	t = -2.51	0.02	-7.94 to -1.81
Range (Median)	30 – 66 (41.93)	30 – 79 (44.97)				
Social deprivation scale (Townsend index):						
Mean (SD)	.18 (3.47)	-1.26 (3.31)	120	t = 2.35	0.02	0.228 to -2.659
Range (Median)	-4.59 – 5.70 (.50)	-7.36 – 5.70 (-1.97)				
Marital status:						
Single (%)	13 (21%)	15 (25%)	1	X^2# = 0.18	0.67	
Living with significant other (%)	48 (79%)	46 (75%)				
Number of dependants:						
None (%)	26 (43%)	37 (61%)	1	X^2# = 3.97	0.46	
One or more (%)	35 (57%)	24 (39%)				
Support on discharge home:						
None / Some (%)	5 (8%)	7 (11%)	2	X^2# = 0.37	0.57	
Great deal (%)	56 (92%)	54 (89%)				
Age left full time education (years) :						
Mean (SD)	17.69 (5.37)	16.92 (3.42)	120	t = -0.38	0.70	-0.84 to -2.38
Still in full time education:						
Yes (%)	3 (5%)	0 (0%)	1	X^{2*} = 3.08	0.24	
No (%)	58 (95%)	61 (100%)				
Reason for surgery:						
Menorrhagia	27	27	2	X^2# = 2.12	0.35	
Fibroids	14	20				
Other	20	14				

Characteristic	**Treatment site** **n = 61**	**Comparison site** **n = 61**	**df**	**Test**	**p**	**CI at 95%**
Incision performed:						
Transverse (%)	52 (85%)	58 (95%)	1	X^2# = 3.33	0.07	
Other (%)	9 (15%)	3 (5%)				
Operation performed:						
TAH +/-BSO (%)	54 (88%)	61 (100%)	1	X^{2*} = 7.43	0.01	
Other (%)	7 (12%)	0 (0%)				

t = t-test # = Pearson Chi-square test * = Fishers exact Chi-square test

4.2.4.2. Summary of patient demographic and characteristic data

Data collected on patient demographic and patient characteristics support the hypothesis that the two sites were comparable as many similarities were observed in the data. Significant statistical differences at $p = <0.05$ were observed for age, social deprivation score (Townsend index) and operation performed. The Bonferroni test (on the patient demographic and patient characteristic data) resulted in a significance level of 0.02. However, this finding did not change the interpretation of results and the two comparison groups remained statistically significantly different in age, social deprivation and operation performed. These differences are now discussed.

Subjects ranged in age from 30 years to 79 years with a mean age of 44.17 years (SD 8.86) being generally middle aged. Most lived in the area surrounding the hospital site and were, therefore, representative of the socio-economic level of the neighbouring area. It was, therefore, anticipated that the treatment site research subjects would have a higher social deprivation score (Townsend index) than research subjects from the comparison site due to the hospital geographical location of the study sites. The treatment site also contained research subjects with a younger average mean age of three and a half years compared with those from the comparison site. Again this was expected due to the geographical location of the sites and the referral pathways i.e. General Practitioners.

It is evident that research subjects from the treatment site were younger (41.73 years) and had a higher level of social deprivation (Townsend index 0.18) compared with their counterparts from the comparison site (46.6 years; Townsend index -1.26). However, it is worth reiterating that the Townsend index groups scores (ranging from 2.5 to 5 as most deprived; -3 to 2.5 as average; -9 to -3 as least deprived). Both the treatment and the comparison group fell into the overall average Townsend index grouping. It is therefore argued that the two groups should be considered comparable.

Finally the two research sites were significantly different on operation performed. All of the patients (100%) from site two had a total abdominal hysterectomy (with or without a bilateral salpingo-oophorectomy) compared with 88% from the treatment site. The other operations undertaken at the treatment site included cystectomy, myomectomy, bilateral salpingo-oophorectomy and laparotomy. These other operations were not expected to affect patient outcomes significantly due to being comparable in magnitude and recovery time to a total abdominal hysterectomy (Govan et al, 1993) including possible complications. The seven research subjects who had undergone an operation other than a total abdominal hysterectomy were retained in the group for analysis.

4.3. Results from research question one

The first research question was: What effect does an ICP have on the outcomes of gynaecological patients attending for major abdominal surgery?
To answer question one, seven testable hypotheses were derived from the research question. Each hypothesis reflects a relationship between the ICP (independent variable) and an outcome (dependent variable).

4.3.1. Hypotheses one

Hypothesis one was rejected as gynaecology patients that underwent major abdominal surgery who had care administered using an ICP had similar expectations of nursing care compared with those patients who received traditional care. Hypothesis one was analysed using a one tailed t-test of independent means. Table18 provides the results of analysis of expectation of nursing care between sites.

Table 18: Patient expectation of nursing care

Variable	Treatment site (n = 61)	Comparison site (n = 60)	Df	t-test	P	CI at 95%
Mean (SD)	78.75* (8.35)	81.22* (7.56)	119	t = -1.70	0.09	-5.34 to 0.40

*0 = lowest score; 100 = highest score

4.3.2. Hypotheses two

Hypothesis two was rejected as gynaecology patients that underwent major abdominal surgery who had care administered using an ICP had similar experience with nursing care compared with a similar group of patients who received traditional care. Hypothesis two was analysed using a one tailed t-test of independent means. Table 19 provides the results of the analysis of patient experience of nursing care between sites.

Table 19: Patient experience of nursing care

Variable	**Treatment site (n = 56)**	**Comparison site (n = 56)**	**Df**	**t-test**	**p**	**CI at 95%**
Mean (SD)	72.19* (18.40)	78.50* (16.77)	110	t = -1.90	0.06	-12.91 to 0.28

*0 = lowest score; 100 = highest score

4.3.3. Hypothesis three

Hypothesis three was rejected as gynaecology patients that underwent major abdominal surgery who had care administered using an ICP had a statistically significant lower satisfaction with nursing care compared with a similar group of patients who received traditional care. Hypothesis three was analysed using a one tailed t-test of independent means. Table 20 provides the results of the analysis of patient experience of nursing care between sites.

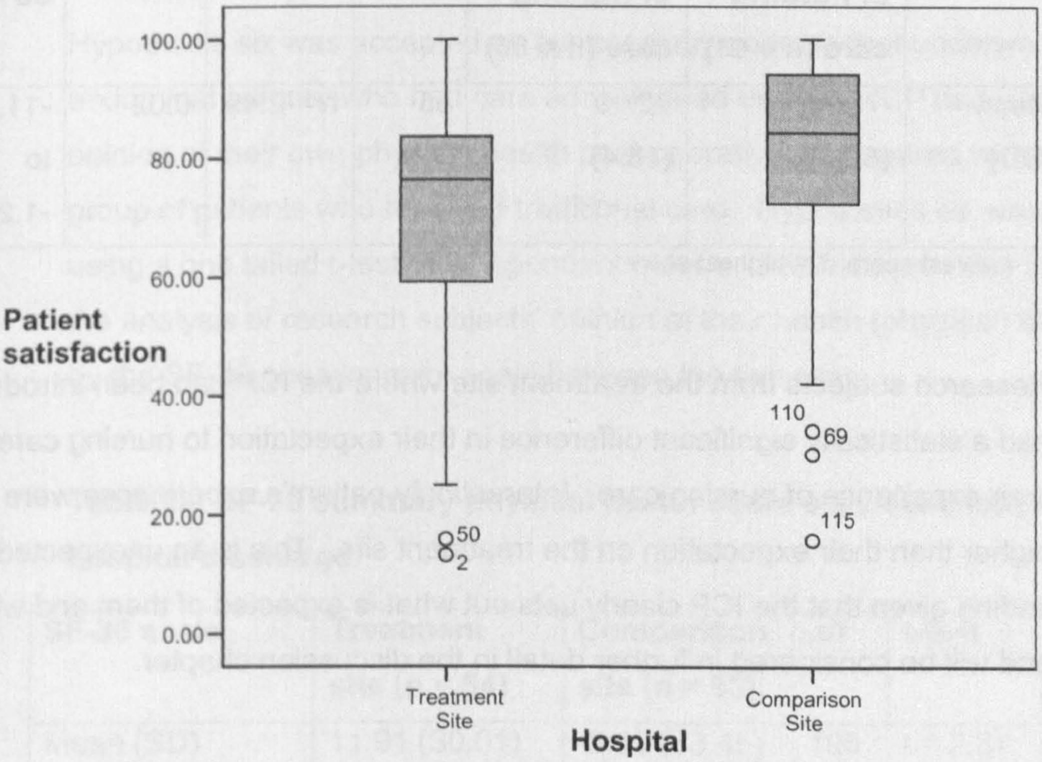
Table 20: Patient satisfaction with nursing care

Variable	**Treatment site (n = 56)**	**Comparison site (n = 56)**	**Df**	**t-test**	**p**	**CI at 95%**
Mean (SD)	70.23* (21.72)	79.46* (19.19)	109	t = -2.37	0.02	-16.94 to -1.51

*0 = lowest score; 100 = highest score

Research subjects from the treatment site had significantly lower satisfaction with nursing care compared with the comparison site subjects. The hypothesis is rejected that patients who have care using an ICP (treatment site) are more satisfied with their nursing care than those patients who receive traditional methods of care delivery (site two). Interestingly there was not difference in patient experience between the two groups. This is an unexpected finding given that the ICP is providing the patient with a clear pathway of care including the pre-operative work up, the intended procedure and the recovery plan, and will be considered in the discussion chapter. The box plot graph (Figure 6) demonstrates the difference in findings across the two sites for patient satisfaction with nursing care.

Figure 6: Box plot graph of patient satisfaction with nursing care



4.3.4. Hypothesis four

Hypothesis four was rejected as there was a statistically significant difference between expectation of nursing care and experience of nursing care for gynaecology patients undergoing major abdominal surgery who had their care administered using an ICP. Hypothesis four was analysed using a two-tailed t-test of independent means. Table 21 provides the results of the analysis of patient expectation of nursing care with patient experience of nursing care at site one (ICP used).

Table 21: Patient expectation and experience of nursing care at site one (ICP used)

Variable	Expectation of nursing care (n = 61)	Experience of nursing care (n = 56)	Df	t-test	p	CI at 95%
Mean (SD)	78.75 (8.35)	72.19 (18.4)	55	t = -2.49	0.02	-11.28 to -1.21

*1 = lowest score; 7 = highest score

Research subjects from the treatment site where the ICP had been introduced had a statistically significant difference in their expectation to nursing care with their experience of nursing care. Interestingly patient's experiences were much higher than their expectation on the treatment site. This is an unexpected finding given that the ICP clearly sets out what is expected of them and when and will be considered in further detail in the discussion chapter.

4.3.5. Hypothesis five

Hypothesis five was accepted as there was no statistically significant difference between expectation of nursing care and experience of nursing care for gynaecology patients undergoing major abdominal surgery who had their care administered using traditional methods of care. Hypothesis five was analysed using a two-tailed t-test of independent means. Table 22 provides the results of the analysis of patient expectation of nursing care with patient experience of nursing care at site two (traditional care).

Table 22: Patient expectation and experience of nursing care at site two (traditional care used)

Variable	Expectation of nursing care (n = 60)	Experience of nursing care (n = 56)	Df	t-test	p	CI at 95%
Mean (SD)	81.22 (7.56)	78.50 (16.77)	54	t = -1.40	0.17	-7.22 to 1.29

*1 = lowest score; 7 = highest score

4.3.6. Hypotheses six

Hypothesis six was accepted as gynaecology patients that underwent major abdominal surgery who had care administered using an ICP had a higher opinion of their own physical health post-operatively compared with a similar group of patients who received traditional care. Hypotheses six was analysed using a one tailed t-test of independent means. Table 23 provides the results of the analysis of research subjects' opinion of their health (physical) as measured by the SF-36 questionnaire scale between the two sites.

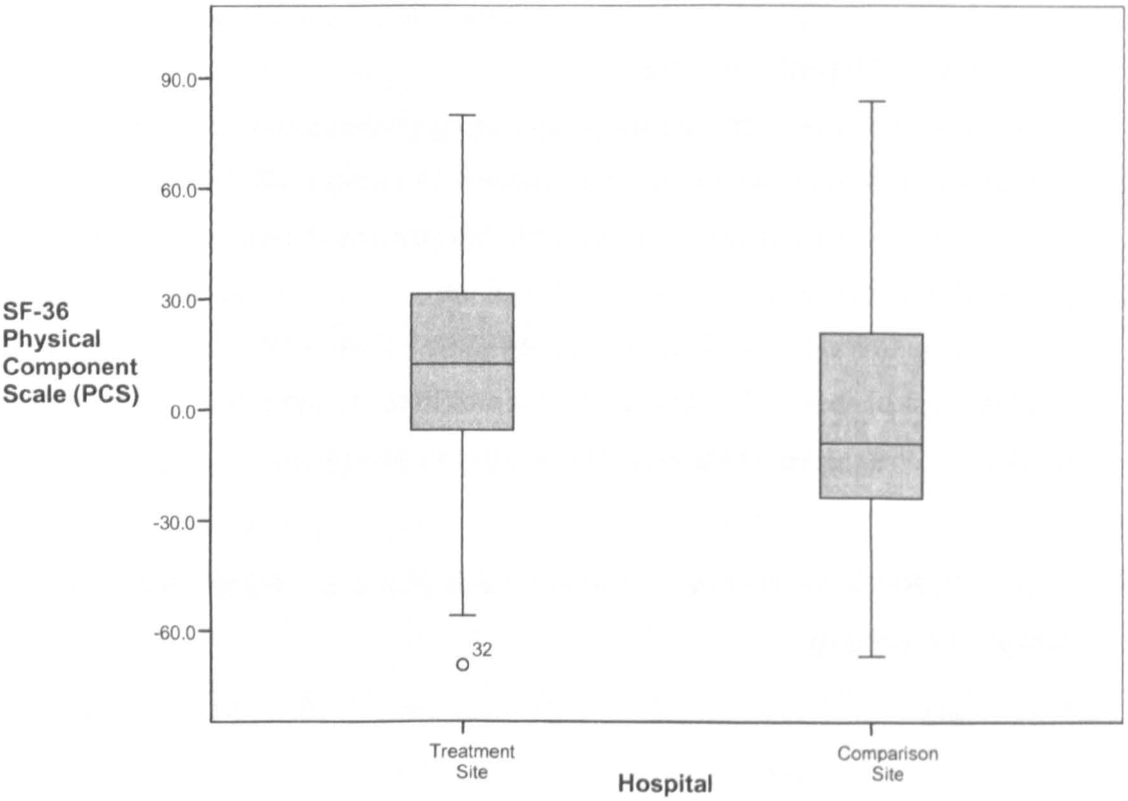
Table 23: SF-36 summary physical health score six weeks following hospital discharge

SF-36 scale	Treatment site (n = 54)	Comparison site (n = 55)	df	t-test	P	CI at 95%
Mean (SD)	11.91 (30.01)	-2.63 (33.45)	105	t = 2.37	0.02	2.35 to 26.73

0 = Low health opinion; 100 = High health opinion for the SF-36 questionnaire

There were statistically significant differences at p <.05 for physical function, energy/ vitality, pain, health transition and the overall aggregated physical score. Hypothesis three was therefore accepted. Research subjects from the treatment site identified their return to their own physical health as slightly better (as evidenced by the aggregated SF-36 physical component summary) than those patients attending the comparison site (treatment site mean 11.91: comparison site mean –2.63). The box plot graph (Figure 7) demonstrates the difference in findings across the two sites.

Figure 7: Box plot graph of patients perception of return to physical health (SF-36 Physical component summary)



4.3.7. Hypothesis seven

Hypothesis seven was rejected as gynaecology patients that underwent major abdominal surgery who had care administered using an ICP had a similar opinion of their own mental health post-operatively compared with a similar group of patients who received traditional care. Hypotheses seven was analysed using a one tailed t-test of independent means. Table 24 provides the results of the analysis of research subjects' opinion of their health (mental) as measured by the SF-36 questionnaire scale between the two sites.

Table 24: SF-36 summary mental health score six weeks following hospital discharge

SF-36 scale	Treatment site (n = 55)	Comparison site (n = 55)	df	t-test	P	CI at 95%
Mean (SD)	21.14 (30.37)	9.31 (34.82)	105	t = 1.87	0.06	-0.71 to 24.36

0 = Low health opinion; 100 = High health opinion for the SF-36 questionnaire

4.3.8. Hypothesis eight

Hypothesis eight was rejected as gynaecology patients that underwent major abdominal surgery who had care administered using an ICP had no differences in complications compared with a similar group of patients who received traditional care. Hypothesis eight was analysed using a Pearson Chi-square test. Table 25 depicts the results of the analysis of research subjects by site on complications. Appendix 12 provides an overview of the complications seen.

Table 25: Number of complications by site

Outcome	Treatment site (n = 61)	Comparison site (n = 61)	Df	Pearson Chi-square test	P
None	21 (34%)	28 (46%)	1	# = 0.67	0.20
One or more	40 (66%)	33 (54%)			

4.3.9. Hypothesis nine

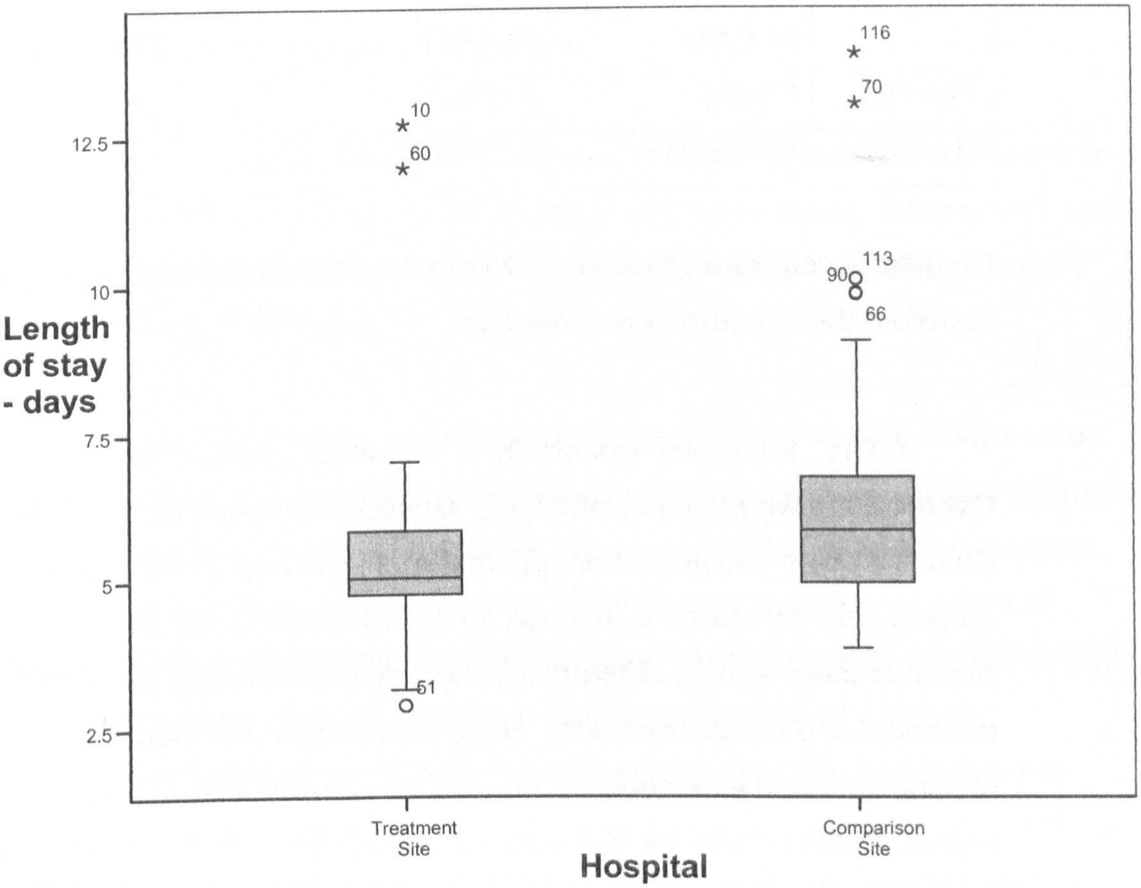
Hypothesis nine was accepted as gynaecology patients that underwent major abdominal surgery who had care administered using an ICP had a statistically significant shorter length of stay compared with a similar group of patients who received traditional care. Hypothesis nine was analysed using a one tailed t-test. Table 26 illustrates the results of the analysis of research subjects by site on length of stay.

Table 26: Length of stay (days) by site

Outcome	**Treatment site (n = 61)**	**Comparison site (n = 61)**	**df**	**t-test**	**p**	**CI at 95%**
Mean (SD)	5.29 (1.58)	6.16 (1.99)	120	t = 2.69	0.01	-1.52 to -0.23
Range (median)	3 – 13 (10)	4 – 14 (10)				

Research subjects at the treatment site (those using the ICP) had a reduced length of stay by 0.87 days compared with those patients at the comparison site (using traditional methods of care delivery). The box plot graph (Figure 8) demonstrates the difference in findings across the two sites.

Figure 8: Box plot graph illustrating length of stay



4.3.10. Hypothesis ten

Hypothesis ten was rejected as gynaecology patients that underwent major abdominal surgery who had care administered using an ICP had no difference in re-admissions to hospital within 30 days of discharge compared with a similar group of patients who received traditional care. Hypotheses ten was analysed using a Fisher exact Chi-square test. Table 27 illustrates the results of the analysis of research subjects by site on readmission to hospital within 30 days of discharge.

Table 27: Re-admission to hospital within 30 days of discharge.

Outcome	Treatment site (n = 61)	Comparison site (n = 61)	df	Fisher exact Chi-square test	P
Yes (%)	5 (8%)	4 (7%)	1	* = 0.12	1.0
No (%)	56 (92%)	57 (93%)			

No differences were observed between the treatment and comparison site and therefore the hypothesis was rejected.

4.3.11. Summary results from research question one

Overall there were some statistically significant differences between the two sites. Research subjects from the treatment site had a lower satisfaction with nursing care compared with those on the comparison site (hypthesis three). However there was no difference in expereince of nursing care between the treatment and comparison site. There was a difference between expectation of nursing care and experience of nursing care (hypothesis four) but only at the treatment site (where the ICP was used). Interestingly the research subjects at the treatment site felt that their return to physical health was slightly better compared with those from the comparison site (hypothesis six). The singular most clinically significant difference between the two sites was that of length of stay (hypothesis nine). The treatment site length of stay was on average 5.29 days whereas on the comparison site it was on average 6.16 days. The difference in length of stay between the two sites equates to nearly one whole day (0.87 days). No differences in the presence of complications or re-admissions were evident between the two sites. The significance of these results are reflected on in the discussion chapter in the light of other studies.

4.4. Results from research question two

What factors including the use of an ICP contribute to the variance in patient length of stay for gynaecological patients?

To answer this question a multivariate analysis was undertaken to determine which variables contributed to the variance in length of stay. Prior to testing the hypothesised model the assumptions underlying multiple regression were tested. The results follow.

4.4.1. Testing the underlying assumptions of multiple regression

Preparation for analysis involved assessment of the assumptions underlying the use of multiple regression. The assumptions of multiple regression analysis include: an adequate ratio of cases to independent variables; Absence of outliers in the data; variables that can be treated as interval level data; variables that are measured without error; absence of multicollinearity among independent variables; normality, linearity and homoscedasticity (data are evenly dispersed both above and below the regression line, indicating a linear relationship on a scatter plot diagram), residuals are not correlated, and difference scores are random and have homogeneous variance. The final assumptions are tested by means of residual analysis (Tabachnick and Fidell, 2001).

The case to independent variable ratio for this analysis was determined to be adequate if using the criterion suggested by Tabachnick and Fidell (2001) was met. The criterion requires $\geq 50 + 8$ (number of independent variables). Using this criterion the calculation resulted in a sample size estimate of 114 cases. The actual analysis included 121 cases, thus meeting the criterion. Age was the only variable that contained outliers. The mean age of the study sample was 44 years (SD = 8.87), for the treatment group the mean age was 42 years (SD = 7.01) and for the comparison group the mean age was 47 years (SD = 9.86). One subject in the comparison group was 79 years of age. The initial t-test showed significant between group differences in age ($t = -2.51$; $p = 0.02$). Removing the outlier from the analysis made little difference in the results ($t = -2.96$; $p = 0.04$), suggesting that the difference between group age difference was not the result of this single outlier. Therefore, the outlier was retained in subsequent analyses. Age, socio-economic status (Townsend index), perception of physical health (SF-36 aggregated physical score), perception of mental health (SF-36 aggregated mental score), experience of nursing care and length of stay were all interval level variables. ICP, reason for surgery and complications were dummy coded to manage these variables as interval level data within the regression analysis (i.e. the outcome for each variable was assigned a numerical value e.g. 1 = ICP present and 2 = no ICP). To meet the assumption that all variables are measured with minimum error, reliable and valid instruments were used. Instruments for the socio-economic status (Townsend index), perception of physical health (SF-36 aggregated physical score), perception of mental health (SF-36 aggregated mental score), and experience of nursing care were selected because they adequately indexed the meaning of concepts in the study and were considered to have sufficient content validity. Instruments were retested for reliability with the current study population and found to have adequate internal consistency reliability. Cronbach's alpha were reported previously in this chapter. Previous research on each of these instruments demonstrated construct validity. Therefore the instruments indexed the study concepts appropriately. Further, each instrument had demonstrated acceptable reliability in previous research (Morris and Carstairs, 1991; Brazier et al., 1992; Thomas et al., 1996). Reliability was re-estimated on the study population and found to meet the 0.80 criterion for reliable scales (Burns and Grove, 2005). Previously described data entry and cleaning procedures provided the best method of assuring measurement without error among the other variables in the model.

Multicollinearity was assessed by means of examining bivariate correlations among interval level variables in the model. At Stage III, experience of nursing care was found to be highly correlated with satisfaction with nursing care (r = 0.91) suggesting that the two variables were referencing a similar concept. Therefore the decision was made to include only experience of nursing care within Stage III of the model. No other variables demonstrated multicollinearity.

Normality was tested for question one in the preliminary analysis for the underlying assumptions of a t-test. Linearity was determined by conducting Pearson correlations between interval level variables and length of stay.

Table 28: Pearson correlation matrix of bivariate relationships on interval level data

Variable	Age	Townsend index	SF-36 Physical	SF-36 Mental	Experience of nursing care
Townsend index	-0.072				
SF-36 Physical	-0.136	-0.123			
SF-36 Mental	-0.049	-0.233*	0.839**		
Experience of nursing care	0.144	0.063	0.041	0.057	
Length of stay	0.207*	0.028	-0.380**	-0.337**	0.143

*Correlation is significant at the 0.05 level (2 tailed)

**Correlation is significant at the 0.01 level (2 tailed)

Only the SF-36 Physical aggregated score and SF-36 Mental aggregated score demonstrated significant correlations ($r = -0.\ 38$, $p = <0.01$; $r = -0.34$, $p = <0.01$ respectively). Age, Townsend index and experience of nursing care demonstrated a weak, non-significant relationship with length of stay and were included in the model because of their hypothesised clinical importance. In addition the ICP, reason for surgery and complications demonstrated a linear relationship with length of stay as demonstrated by the eta statistic (Table 29).

Table 29: Correlations between nominal level variables and length of stay

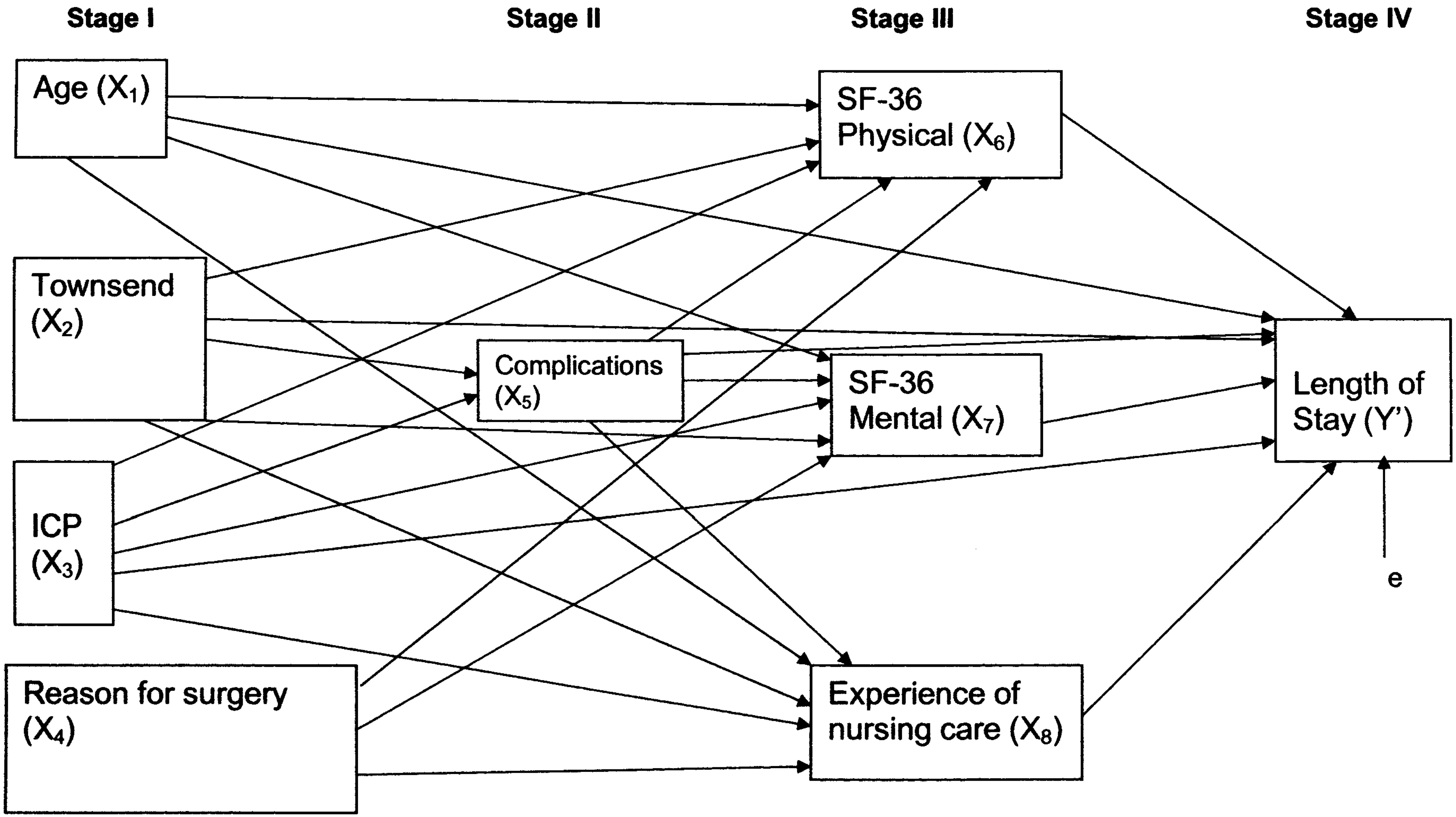
Variable	**Eta^2**	**Significance level**
Reason for surgery	0.13	0.46
ICP	0.57	0.01
Complications	0.45	0.02

Residual analysis was conducted at the time of model testing on all the independent variables. Residuals were examined for homoscedasticity and no violations were found (expected cumulative probability against the observed cumulative probability).

4.4.2. Multiple regression analysis results

The path diagram with respective path coefficients and squared multiple correlations is presented in Figures 9 to 16. Each stage of the model was tested independently and is represented in the diagrams that follow. The nine variables Age (X_1), Townsend index (X_2), ICP/ Site (X_3), Reason for surgery (X_4), Presence of complications (X_5), SF-36 aggregated physical score (X_6), SF-36 aggregated psychological score (X_7), Experience of nursing care (X_8), and Length of stay (X_9), are included in the staged models (Figure 9).

Figure 9: Complete model

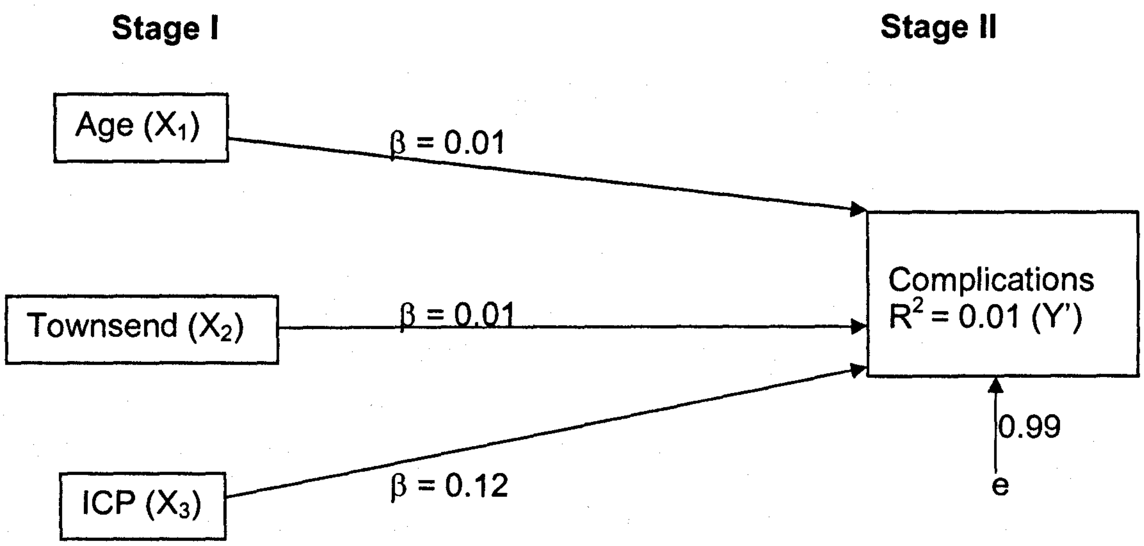


$$Y^1 = \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta B_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + e$$

4.4.2.1. Stage I to II

Step 1 represents a hypothesised model including stage I and II (Figure 10). The stage II variable, complications was regressed on three of the Stage I exogenous variables: Age, Townsend index and ICP. None of the hypothesised paths between age, Townsend index, ICP and complications were significant at the 0.05 level. In other words, the patient's age, socio-economic status (Townsend index) and whether or not an ICP was used in administering care had no meaningful influence on the presence of complications that patients developed post operatively.

Figure 10: Step 1 (stage I and II)

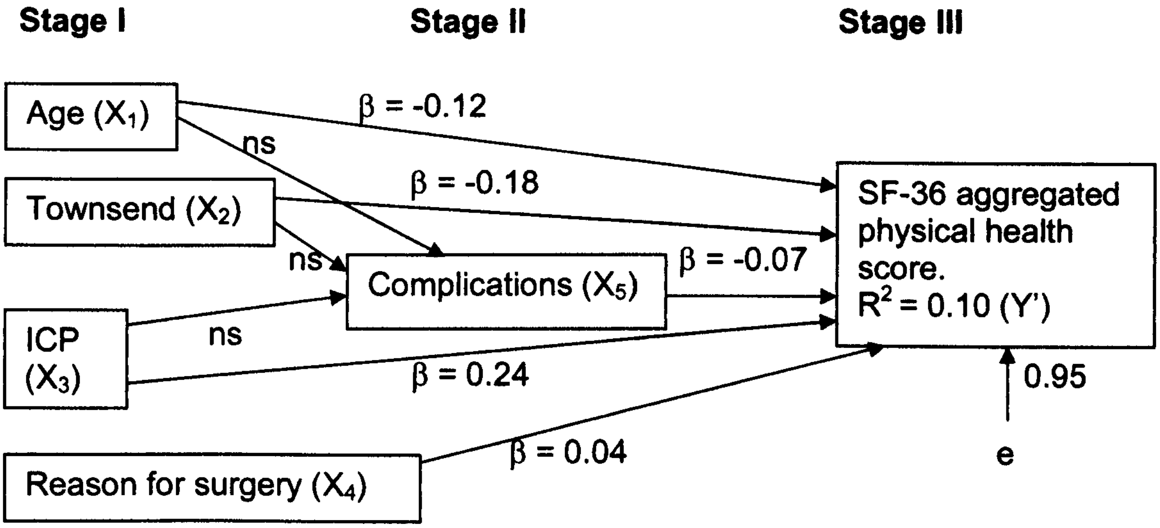


$$Y^1 = (0.01)\,X_1 + (0.01)\,X_2 + (0.12)\,X_3 + e$$

4.4.2.2. Stage II to stage III

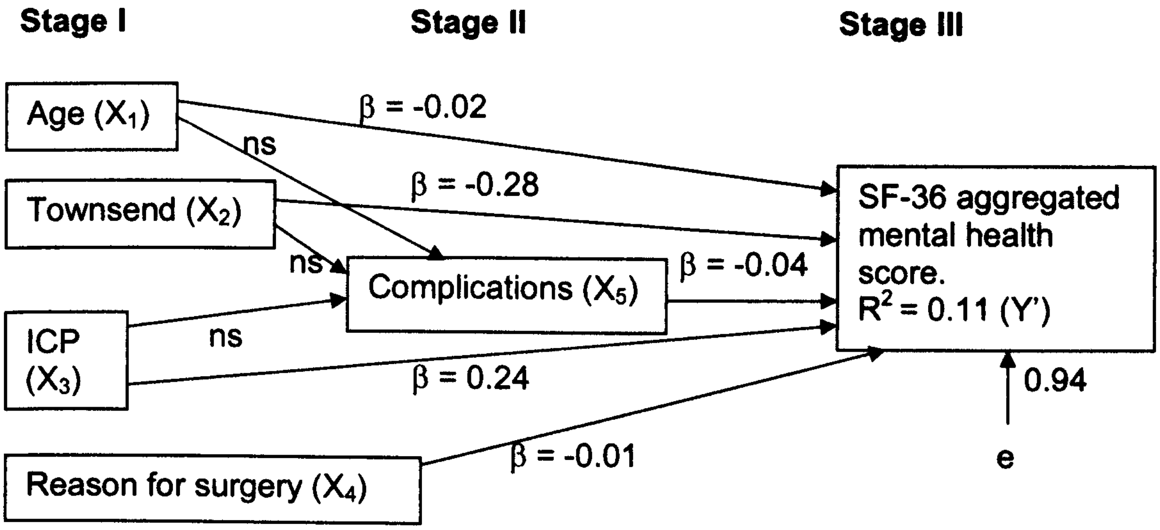
Step 2, 3 and 4 represent hypothesised models including stage I, II and III (Figures 11 to 13). The stage III variables (SF-36 Physical, SF-36 Mental and the experience of nursing care) were individually regressed on the stage I variables (age, Townsend index, ICP and reason for surgery) thus testing the direct paths from stage one to stage three. The results are depicted in the three separate models represented in Figures 11 to 13. The indirect paths from stage one to stage three through the stage II variable, complications were also tested. As anticipated the indirect paths were not significant due to the non-significant paths from stage one to stage three described above. The only significant pathway was that of the ICP on the SF-36 physical health score ($\beta = 0.24$: $p = 0.02$). In other words, whether or not an ICP was used in administering care had an influence on the patient perception of their return to physical function (SF-36 aggregated physical score) post operatively.

Figure 11: Step 2 (Stage I, II and III)



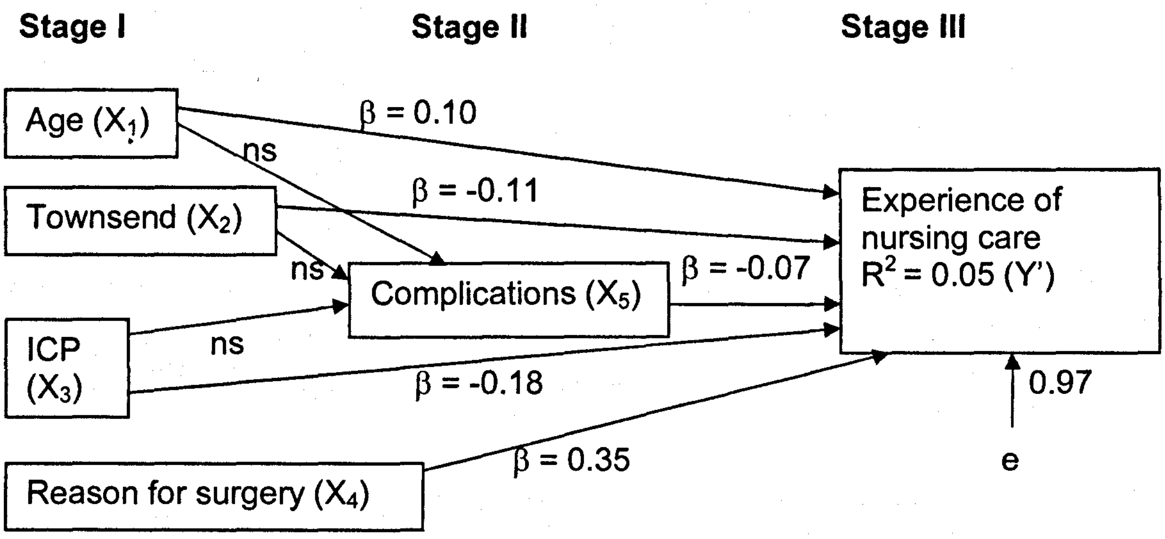
$$Y^1 = (-0.12)\,X_1 + (-0.18)\,X_2 + (0.24)\,X_3 + (0.04)\,X_4 + (-0.07)\,X_5 + e$$

Figure 12: Step 3 (Stage I, II and III)



$$Y^1 = (-0.02)\,X_1 + (-0.28)\,X_2 + (0.24)\,X_3 + (-0.01)\,X_4 + (-0.04)\,X_5 + e$$

Figure 13: Step 4 (Stage I, II and III)

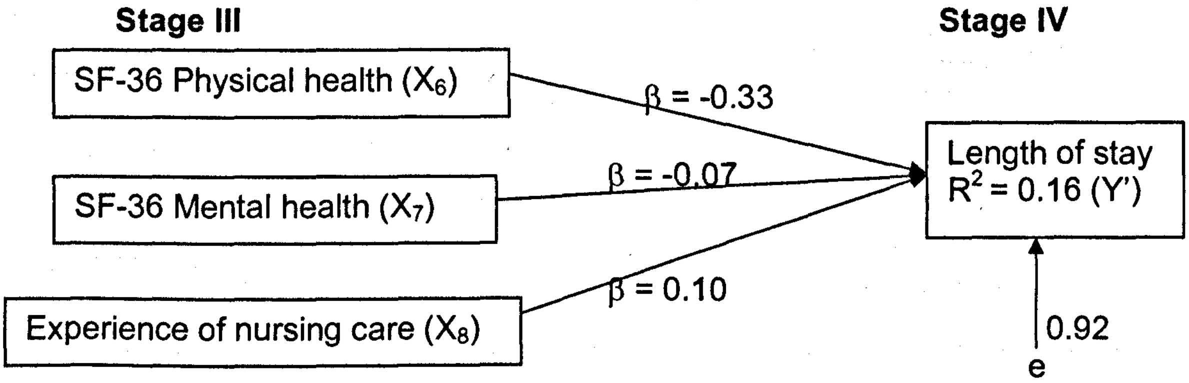


$$Y^1 = (0.10)\,X_1 + (-0.11)\,X_2 + (-0.18)\,X_3 + (0.35)\,X_4 + (-0.07)\,X_5 + e$$

4.4.2.3. Stage III to IV

Step 5 represents a hypothesised model including stage III and IV (Figure 14). The stage IV variable, length of stay was regressed on three of the Stage III variables: SF-36 physical health, SF-36 mental health and experience of nursing care. None of the hypothesised paths between SF-36 physical health, SF-36 mental health, experience of nursing care and length of stay were significant.

Figure 14: Step 5 (Stage III and IV)

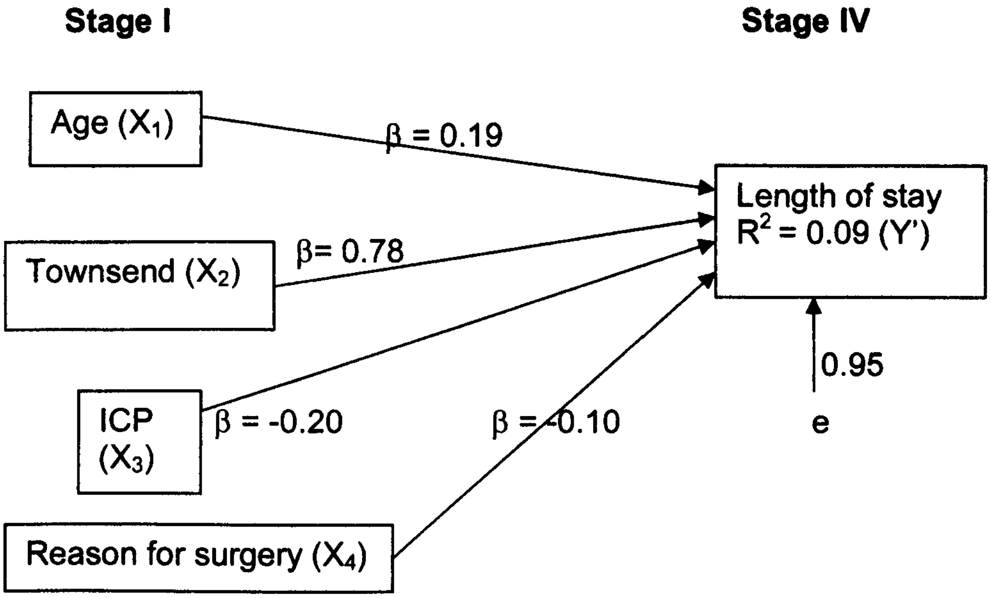


$$Y^1 = (-0.33)\,X_6 + (-0.07)\,X_7 + (0.10)\,X_8 + e$$

4.4.2.4. Stage I to IV

Step 6 involved testing the hypothesized direct paths between the four stage I variables age, Townsend index, ICP and reason for surgery on the final outcome variable at stage IV, length of stay (Figure 15). There was no direct influence of age, the Townsend index or reason for surgery on length of stay ($\beta = 0.19$ $p = 0.06$; $\beta = 0.78$ $p = 0.39$; $\beta = -0.10$ $p = 0.32$ respectively). However, the results identified a significant direct influence of the ICP on the length of stay ($\beta = -0.20$ $p = 0.04$), indicating that the use of the ICP had an influence on reducing length of stay. However, the ICP only explained a small amount of the variance of Length of stay $R^2 = 0.09$ (less than 10%).

Figure 15: Step 6 (Stage I and IV)

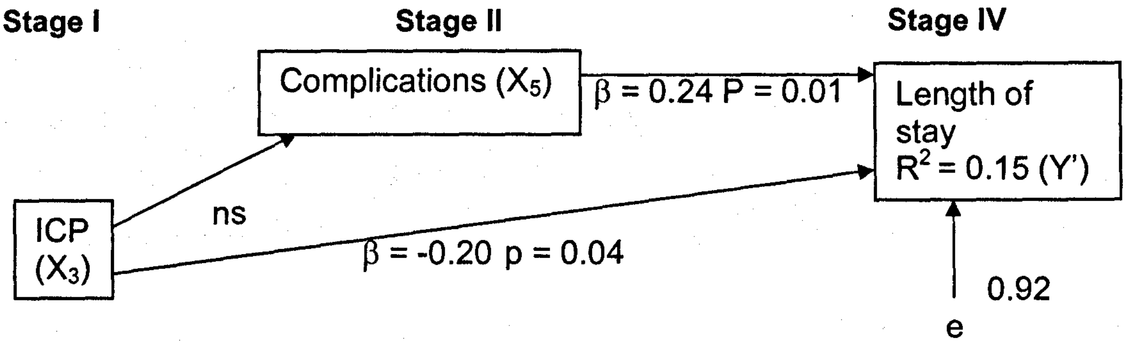


$$Y^1 = (0.19)\,X_1 + (0.78)\,X_2 + (-0.20)\,X_3 + (-0.10)\,X_4 + e$$

4.4.2.5. Stage I to II to IV

Step 7 represents a hypothesised model including stage I, stage II and stage IV. The stage IV variable, length of stay was regressed on the only significant Stage I variable ICP, and through the stage II variable, complications (Figure 16). There was no direct influence of the ICP on complications. However, the results identified a significant direct influence of the ICP ($\beta = -0.20$ $p = 0.04$), and post operatively complications on length of stay ($\beta = 0.24$ $p = 0.01$). In other words, whether or not an ICP was used in administering care and the presence of complications accounted for 15% of the variance in length of hospital stay.

Figure 16: Step 7 (Stage I, II and IV)

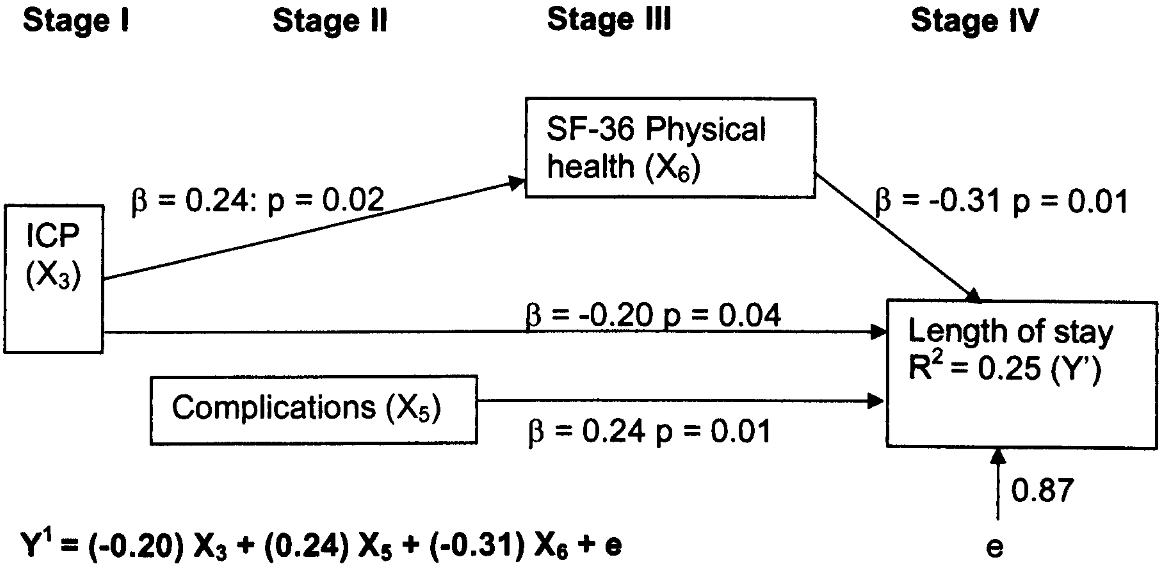


$$Y^1 = (-0.20)\, X_3 + (0.24)\, X_5 + e$$

4.4.2.6. Stage I to II to III to IV

Step 8 involved testing the hypothesised paths between the four stage I variables, the one stage II variable and the three stage III variables on the dependent variable of length of stay at stage IV (Figure 17). Three of the hypothesised paths were significant indicating that the use of an ICP ($\beta = -0.20$ $p = 0.04$), the presence of complications post operatively ($\beta = 0.24$ $p = 0.01$) and the patients perception of their physical health ($\beta = -0.31$ $p = 0.01$) were associated with a shorter length of stay. Additionally the ICP indirectly influenced length of stay through the patient's perception of physical health ($\beta = 0.24$: $p = 0.02$). The refined model (Figure 17) explained 25 percent of the variance in length of stay ($R^2 = 0.25$).

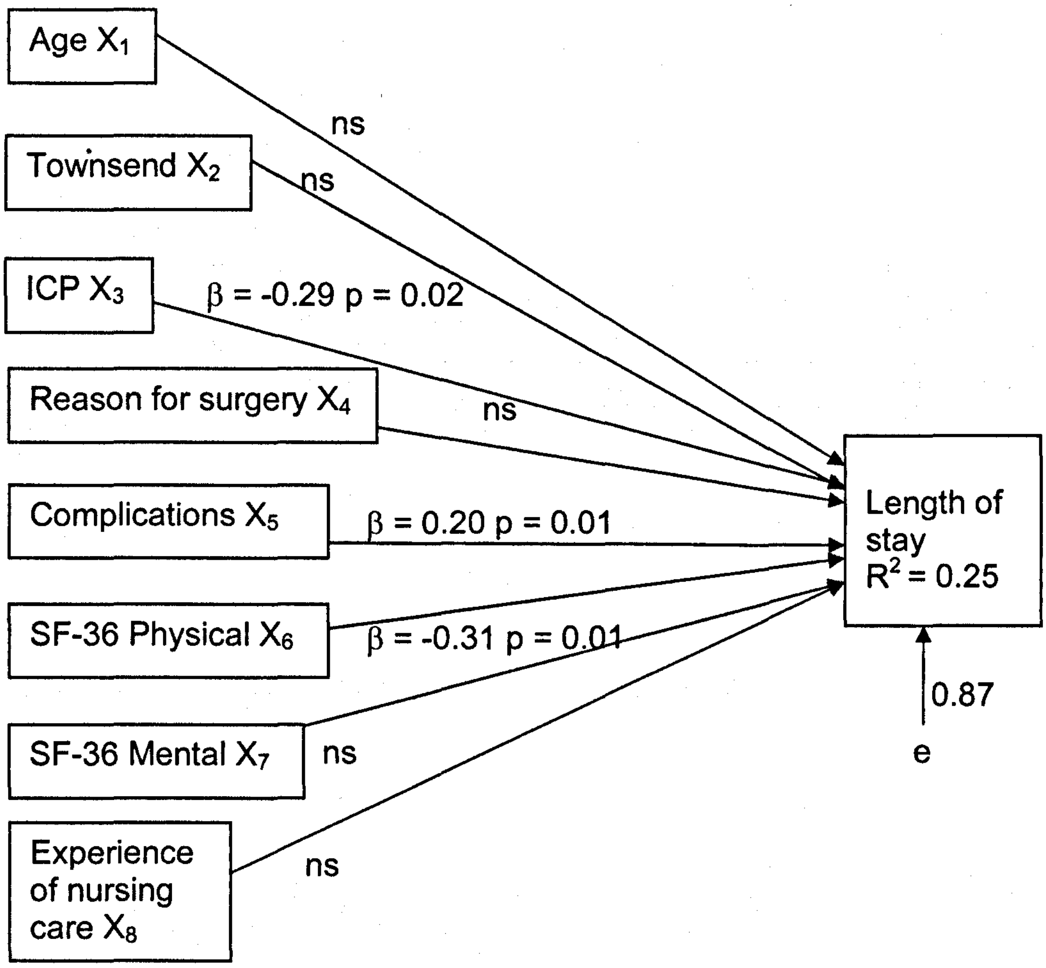
Figure 17: Trimmed model showing significant paths



$$Y^1 = (-0.20)X_3 + (0.24)X_5 + (-0.31)X_6 + e$$

Additionally the full model was re-analysed using a confirmatory, stepwise multiple regression (Figure 18). In this analysis all variables were entered simultaneously without specifying the hierarchical order that existed in the previous analysis.

Figure 18: Full model using stepwise multiple regression



$Y^1 = (-0.29)\ X_3 + (0.20)\ X_5 + (0.20)\ X_6 + e$

The stepwise regression analysis confirmed the hierarchical theoretical model testing resulting in identical significant paths for the variables of ICP, presence of complications and the patients perception of their return to health on the dependent variable length of stay as well as the R^2 of 0.25 (Table 30).

Table 30: Multiple regression statistics

Variable	**Standardised Beta co-efficient**	**R^2**	**p**
SF-36 Physical component scale	-0.31	0.14	0.01
Care Pathway and SF-36 Physical component scale	-0.29	0.21	0.02
Complications, Care Pathway and SF-36 Physical component scale	0.20	0.25	0.02

4.4.3. Summary results from research question two

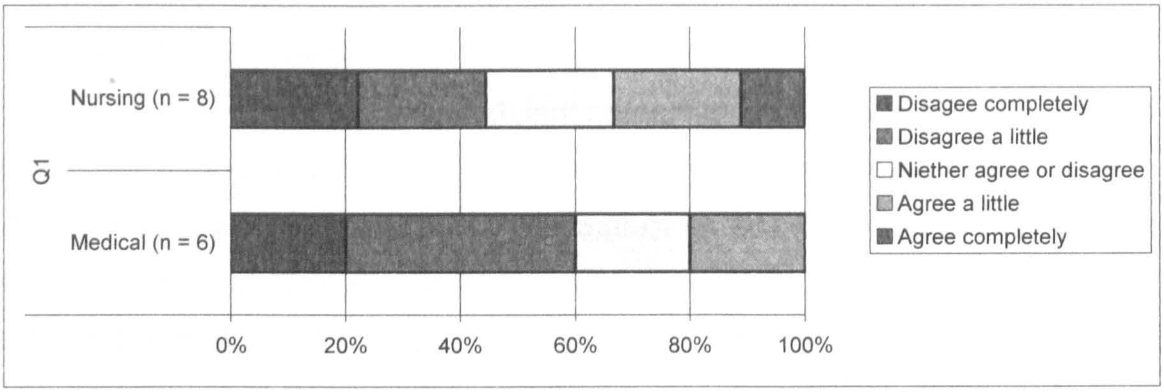
The regression model that has been presented was developed to answer the second research question 'What factors including the use of an ICP contribute to the variance in patient length of stay for gynaecological patients?' The regression model estimated that, by using the ICP to deliver patient care, the presence of complications and individuals' high opinion of their physical health explained 25% of the variance in length of stay. Within this model the ICP also had an indirect influence on length of stay through the patient's perception of their return to physical health. It would be advantageous to understand, whether as the patients' perception of their return to physical health increased so their length of hospital stay decreased.

4.5. Results from research question three

What are the opinions of the staff that have used the ICP of the ICP itself?
To answer this question descriptive exploratory data were reviewed from the staff questionnaire.

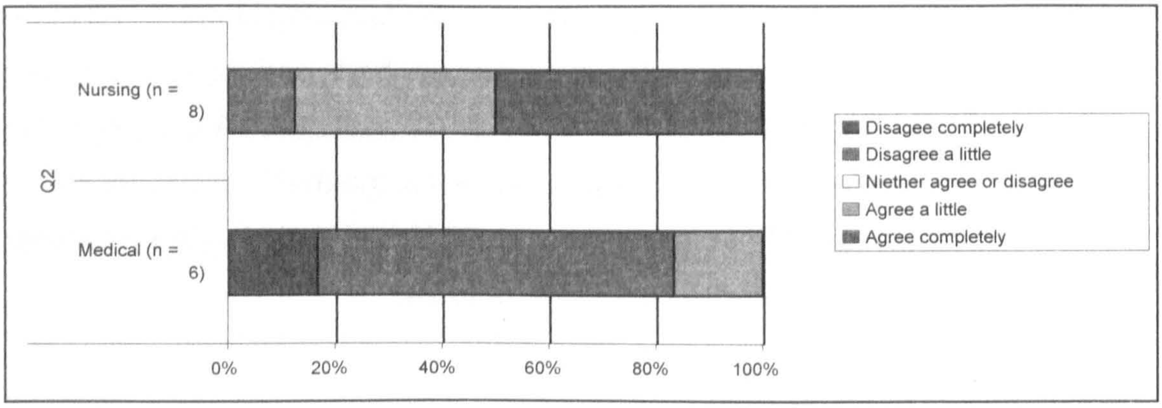
A total of 14 questionnaires were returned including six from medical staff and eight from nursing staff. No questionnaires were returned from therapy staff. The low response rate in discussed in the following chapter. All of the staff that completed and returned the questionnaire had used the ICP with several patients (ranging from 10 to more than 30 patients). A five point Likert scale was used in the questionnaire to ascertain the multidisciplinary staff members' opinion of the ICP in relation to six specific statements. The statements and responses are depicted in Figure 19 to 24.

Figure 19: Results from staff questionnaire: Statement 1: The abdominal surgery ICP reduced multidisciplinary teamwork



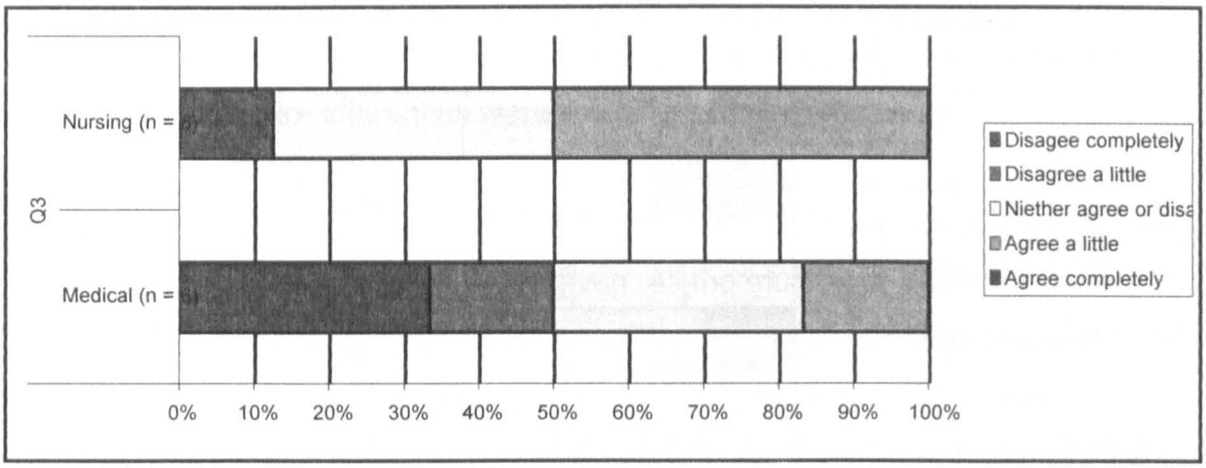
The responses to this question are distributed across the range and disciplines. The results indicate that staff did not believe that the ICP either improved or reduced multidisciplinary teamwork. Multidisciplinary teamwork refers to the individual professionals and how they relate to one another to provide patient care.

Figure 20: Results from staff questionnaire: Statement 2: The abdominal surgery ICP was easier to use than traditional methods of patient notes



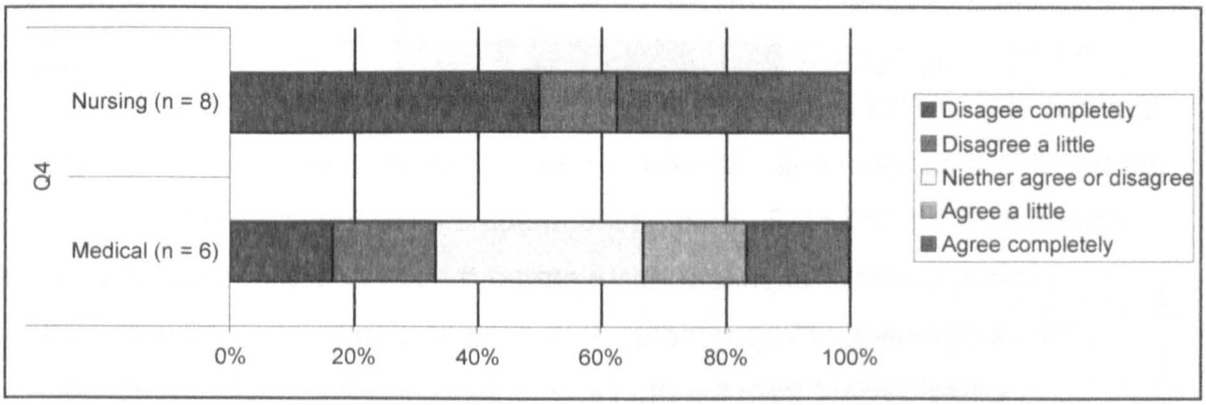
87.5% of the nursing staff agreed completely or agreed a little to finding the ICP easier to use than traditional methods compared with only 17% of the medical staff. This is probably because the ICP is similar to the nurses' traditional method of documenting care and therefore it not great a change.

Figure 21: Results from staff questionnaire: Statement 3: The abdominal surgery ICP improved the clinical management of patients



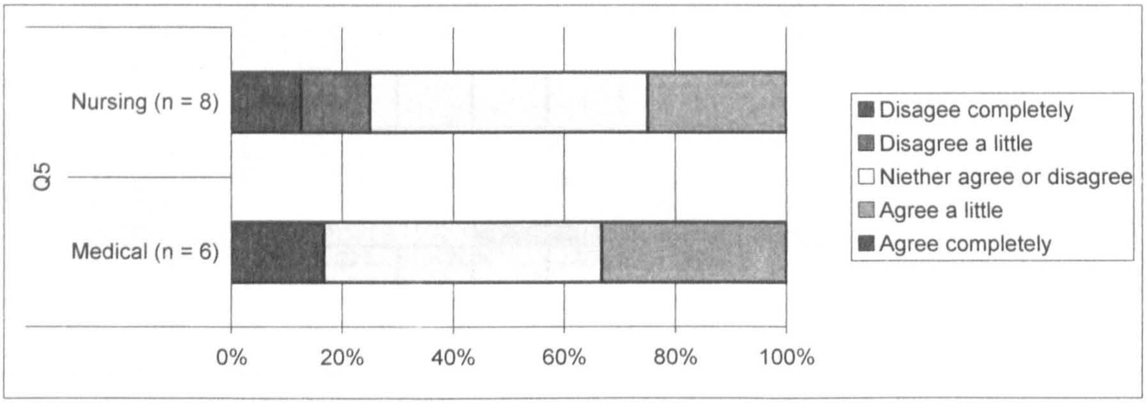
Again the nursing staff found that the ICP improved the clinical management of patients compared with the medical staff. This is probably to be expected as the ICP is referred to more frequently by the nursing staff and it replaces traditional nursing care plans as it explicitly states what should be happening to the patient.

Figure 22: Results from staff questionnaire: Statement 4: The abdominal surgery ICP increased the amount of time documenting care compared with traditional methods



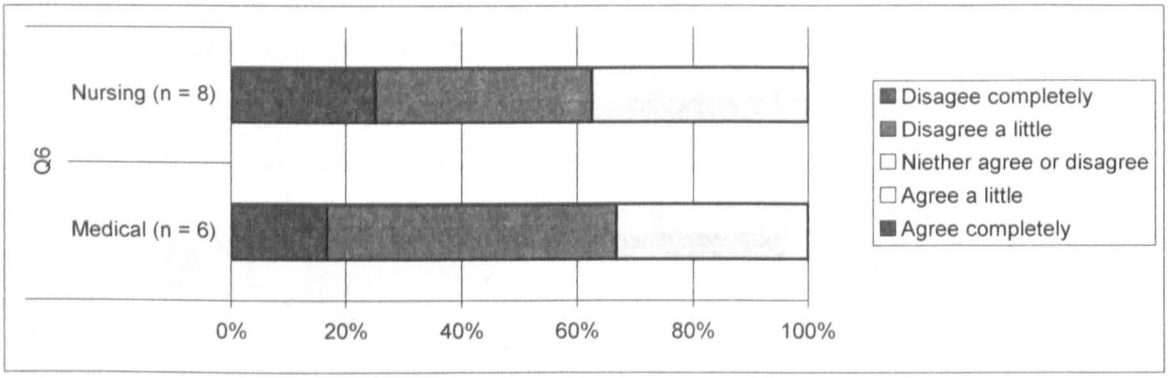
The response to this was split across the range with 60% of nursing staff and 35% of medical staff disagreeing completely or disagreeing a little. Interestingly 30% of medical staff neither agreed nor disagreed.

Figure 23: Results from staff questionnaire: Statement 5: The abdominal surgery ICP improved the quality of information available to patients compared to traditional methods



Most of the responses (50%) both from nursing and medical staff neither agreed nor disagreed with this. 27.5% of medical staff agreed a little and 17.5% who disagreed completely. 22.5% of nursing staff agreed a little and 22.5% disagreed completely or a little.

Figure 24: Results from staff questionnaire: Statement 6: The abdominal surgery ICP limited clinical judgement



100% of the respondents supported the notion that the ICP did not limit clinical judgement. It was imperative that the staff using the ICP appreciated that care could deviate from the plan due to an individual patients need.

Additionally staff were asked to rank how they felt the ICP supported three specific activities (teaching, research and audit) along a 100mm continuum (0mm being not helpful to 100mm being very helpful). For teaching the average score was 49.9 (range from 10 to 92). For research the average score was

55.8 (range from 16 to 92). Two staff members did not comment. Finally for audit the average score was 68.2 (range from 13 to 93). Two staff members did not comment. Overall the results from ranking the three specific activities were mid range to positive, with audit being seen as the most helpful activity that the ICP supported. No differences were seen by professional group.

Staff were then asked to name one best and one worst thing about the ICP. For the best the following answers were given: All the multidisciplinary team are writing in the same place (n = 3); Reduced repetition (n = 3); Reduces time documenting care (n = 5); Nice colours (n = 1). For the worst the following answers were given: Difficulty in finding ICP (n = 3); Need to keep transferring ICP from medical notes to nursing notes (n = 5); Medical part not up to date (n = 2); Separated from patients notes (n = 1); Confused as to where to write (n = 2); Not being used correctly (n = 1).

Finally staff were invited to make any additional comments about the ICP that had not been covered. This resulted in only one person (nursing staff member) adding that the ICP helped with understanding what the other profession had undertaken with the patient.

4.5.1. Summary results from research question three

There was a split between the benefits and drawbacks of using the ICP from different professions. Within professions, very similar responses were seen indifferent to grade or position. The nursing staff found the ICP easy to use and it improved the clinical management of the patients. The medical staff found the ICP reduced the amount of time documenting care. Both professional groups felt that the ICP did not reduce or improve teamwork, reduce the quality of information or limit clinical judgement. All professions thought that the ICP supported teaching, audit and research activity. A couple of areas for improvement were around access and storage of the ICP whilst it was in use.

4.6. Conclusion

This chapter presented the results from the analysis of the study data. Preliminary analysis regarding the data entry rate, response rates, testing the underlying assumptions of the statistical tests, sample distribution, reliability of instruments and group equivalence was given under the patient and staff data sets. The data were presented in order of the three research questions allowing the hypotheses to be answered.

The first research question was: What effect does an ICP have on the outcomes of gynaecological patients attending for major abdominal surgery?

To answer question one, ten testable hypotheses were derived from the research question. Three of the hypothesis resulted in statistically significant differences between the two sites. The research subjects at the treatment site had a lower satisfaction with nursing care (9.23 mean difference: $p = 0.02$), they felt that their return to physical health was slightly better at 6 weeks following the surgery (14.54 mean difference: $p = 0.02$) and they had a reduced length of hospital stay (mean difference of 0.87 days: $p = 0.01$) compared with those from the comparison site. Additionally a difference was noted between expectation and experience of nursing care at the treatment site (6.24 mean difference; $p = 0.02$). Importantly re-admission rates were comparable between the two sites indicating that an ealier discharge did not lead to more re-admissions.

The second research question was: 'What factors including the use of an ICP contribute to the variance in patient length of stay for gynaecological patients?' To answer this question a multivariate analysis was undertaken to determine which variables contributed to the variance in length of stay.

The regression model estimated that, by using an ICP to deliver patient care, the presence of complications and the higher the opinion of the individual's physical health explained 25% of the variance of length of stay. Within this model the ICP also had an indirect influence on length of stay through the patient's perception of their return to physical health.

The third research question was: 'What are the opinions of the staff who have used the ICP of the ICP itself?' To answer this question descriptive exploratory data were reviewed from a staff questionnaire. Overall the nursing staff found the ICP easy to use and it improved the clinical management of the patients, and the medical staff found the ICP reduced the amount of time documenting care. Both professional groups felt that the ICP did not reduce or improve teamwork, reduce the quality of information or limit clinical judgement. All professions thought that the ICP supported teaching, audit and research activity. Suggested areas for improvement focused on access and storage of the ICP whilst it was in use.

Overall the results are positive for the introduction of the ICP; however, there are still some areas of concern that need exploring in relation to the wider literature and this is undertaken in the discussion chapter.

5. Chapter Five: Discussion

5.1. Introduction

This final chapter is a discussion of the results. Literature will be included within the discussion to highlight similarities or differences between the current research findings and that of other authors.

The chapter will initially be presented in line with the three research questions:

1: What effect does an ICP have on the outcomes of gynaecological patients attending for major abdominal surgery?

2: What factors, including the ICP, contribute to the variability in gynaecological patients' length of stay?

3: What are the opinions of the multidisciplinary staff who have used the ICP of the ICP itself?

Prior to discussing the findings it may be useful to review the purpose of the study. This study was designed to investigate the effect of an ICP on outcomes at patient, provider and systems level. A theoretical model based on Holzemer (1994, originating from the work of Donabedian, 1966) was utilised to reflect the specific stages of interest i.e. structure, process and outcome at the patient, provider and system level. The research problem arose following an extensive review of the literature, resulting in limited empirical evidence on the effects of ICPs. The previous chapter has demonstrated some positive results for the study's hypotheses. This chapter will reflect on the statistically significant results from a clinical context and compare them with findings obtained by other investigators in the field of ICPs. A review of the theoretical model describing the relationship between structure, process and outcome at the patient, provider and system level will also be addressed. This is followed by a critical discussion of the study's limitations including a review of the sample size, data collection instruments and variables. The chapter concludes by putting into context what this research study means to nursing practice, research and education.

5.2. Research question results and discussion

The research problem was divided into three research questions, with specific hypotheses as appropriate. As described on page 139, multiple testing was accounted for by applying the Bonferroni correction meaning that $p < 0.02$ was accepted as being statistically significant. Only the statistically significant results from the research questions are discussed. Firstly, they are individually reviewed under the specific research questions and directional hypothesis before being considered collectively.

5.2.1. Research question one

What effect does an ICP have on the outcomes of gynaecological patients attending for major abdominal surgery?

Three (hypothesis three, six and nine) of the directional research hypotheses yielded statistically significant results at $p<0.05$ indicating a difference between the two sites. Additionally hypothesis four highlighted a statistically significant difference in expectation to experience of nursing care at the treatment site. The results were not only statistically significant but also have a valuable clinical significance at patient, staff and systems level. The statistically significant results are discussed in light of the literature.

5.2.1.1. Hypothesis three

Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have a statistically significant higher level of satisfaction with nursing care compared with a similar group of patients who receive traditional care.

Hypothesis three was rejected, as there was a difference between the two sites on patient satisfaction with nursing care. The treatment site (one) had a lower overall score than the comparison site (two). The data collection instrument of the NSNS was identified as suitable for comparing satisfaction with nursing care across wards and hospital units. Internal consistency with the study population resulted in an acceptable standardised Cronbach's alpha (0.86). It is suggested that the difference between the two sites on patient satisfaction with nursing care was a direct result of the ICP on the treatment site (one). In this study the ICP did not improve the patients satisfaction with their nursing care but actually lowered it. It is commonly believed that satisfaction with healthcare may be dependent upon variables such as social class, marital status, age and gender (Sitzia and Wood, 1997). No correlation between the patient's age and Townsend index were seen with regard to their satisfaction of nursing care. There are different accounts by authors within the literature about the influence ICPs have on patient satisfaction. The majority of accounts are positive suggesting ICPs maintain the quality of care (Ghosh et al., 2001); or that satisfaction is raised as a direct result of ICPs (Blegan et al., 1995; De Luc, 2000; Johnson, 1997; Mahon, 1996; Roberts et al., 2004; Renholm et al., 2002; Wigfield and Boon, 1996). In a study on patients admitted as an emergency with a fractured neck of femur Santamaria et al. (2002) recorded an increase in satisfaction between admission and discharge in the ICP group, followed by a fall at three months. Erwin (2006) highlights that increased patient satisfaction is generally associated with good relationships between the nurses and medical staff. Again, the ICP should have led to improved collaboration and communication among the multidisciplinary team. Interestingly, studies developed in stroke rehabilitation care reported that patient satisfaction was lower through the introduction of ICPs (Hankey, 2003; Kwan and Sandercock, 2002). Additionally De Luc (2000) reported a decrease in satisfaction in a cohort of patients where a maternity ICP was used.

An ICP sets out what is expected for a specific episode of care, and this may be seen as providing standardised care rather than individualised patient care. To increase satisfaction with nursing care, one suggestion is that the care should be tailored for the individual patient (Erwin, 2006). Tailoring requires knowing what the patient prefers before care is given. Assessing patients' preferences should be a major component of the nursing assessment. For example, if a patient feels they have less freedom to choose aspects of their care this could have a direct impact on how satisfied they feel. The time needed to conduct an individual assessment (highlighting patient preferences) could be made available if the nurse's time was redirected from duplicate of efforts, such as repeating the history or physical examination performed by the medical staff.

Turning to the data collection instrument, one specific question might have had an influence on the ICP group (Question 9: Nurses made me do things before I was ready). All subjects on the treatment site, with the exception of one, agreed with question 9, whereas two subjects on the comparison site disagreed reinforcing the idea that the goals set out in the ICP may be followed regardless of patient choice. It should be noted that although the one question is of interest it would not have contributed to the statistical significant difference between the two sites alone.

Leaving hospital earlier, and thereby having reduced contact with clinical staff could also have an influence on the patients perception of their experience of care and this is supported by De Luc (2000) and Kwan and Sandercock (2004). Additionally, the reason for the patients admission to hospital and outcome from that admission could have a relationship on how satisfied they will be. For example if the patient is having treatment for cancer they are more likely to be concerned with the outcome. Carr-Hill (1992) supports this argument by stating that satisfaction varies depending upon the intervention. Mahon (1996) states that behaviours that indirectly suggest dissatisfaction include noncompliance with treatment regimes, premature self termination of care, termination of membership in a health plan, and seeking care outside the plan. Ghosh et al. (2001) and De Luc (2000) found that patients cared for with an ICP for cervical, endometrial and breast cancer were just as satisfied with their care as patients who were being cared for using traditional methods. Behaviour change often requires individuals to feel uncomfortable with her or his current behaviour. Approaches that are designed to create discomfort in patients are not always compatible with high levels of satisfaction e.g. smoking cessation (Erwin, 2006). The transtheoretical model of behaviour change offers an explanation of why dissatisfied patients may have better outcomes than satisfied patients (Ervin,

2006) and will be further discussed in light of the positive outcome regarding health status.

One of the main dilemmas in asking patients for their opinion is whether the enquiries truly reflect the actual satisfaction state. The timeliness of the questions and the level of cohersion a patient feels are critical factors. On the one hand one wants to obtain feedback closest to the event as possible (due to memory fading and a halo of gratitude), but this must be balanced with ensuring the patient feels able to be open and honest without the fear of repercussions (French, 1981). Data collection will be considered with the studies other limitations at the end of the chapter.

5.2.1.2. Hypothesis four

For gynaecology patients undergoing major abdominal surgery who have care administered using an ICP, there will be no statistically significant differences between expectation of nursing care and experience of nursing care.

Hypothesis four was rejected as there was a difference between expectation and experience of nursing care, in that the patient experience of nursing care was higher than their expectation of nursing care on the treatment site. This was an unexpected finding, as the ICP should have made care explicit describing what patients should expect. De Luc (2000) suggests that involving patients in their care by informing them of their expectations using an ICP should improve communications. However not all patients want to know details about what is expected to happen to them (Erwin, 2006) and therefore specifying upfront the expected journey may have the opposite effect. Five specific questions showed statistically significant differences (improvements) between expectation and experience of nursing care; Explanation around treatment plan, providing information when needed, comforting upset patients, regularly checking to see that the patient "was ok" and an explanation of care to the next shift of nursing staff. Quality of nursing care is important to patient satisfaction because it is the major service provided to hospitalised patients in nursing care (Mahon, 1996). It should be noted that there were no differences in nursing numbers or skill mix between the treatment and comparison site during the study (as recent research by Aiken et al, 2007 found there to be a positive link between the availability of more hours of nursing care and patient experience). Erwin (2006) states that a decrease in nurse staffing ratio results in a decline in patient satisfaction.

Previous ICP studies that included and reported experience of nursing care had not included expectation. The rationale for including patient expectation compared with experience was around the notion that expectation may better represent the quality of care outcome measures than satisfaction alone. Expectations have been defined as those responses that are situation specific. Normally satisfaction levels are unrealistically high (De Luc, 2000) and expectation would provide a realistic baseline. Additionally, experience changes can occur in precise areas that can be linked to some kind of change i.e. the introduction of the ICP. Expectation emerges repeatedly as having a fundamental role in expression of satisfaction (Sitzia and Wood, 1997). Linder-Pelz (1982) states that satisfaction scores will be directly related to the sum of the products of expectations. It is argued that patient satisfaction is directly influenced by the degree to which care fulfils expectations (Ferrans et al, 1987; Greeneich et al, 1992). Mahon (1996) highlights that satisfaction is the degree of congruency between a patient's expectation of ideal nursing care and their perception of the real nursing care received. Interestingly, previous studies on patient satisfaction have concluded that those with the most unrealistic expectations are the least satisfied (Abramowitz et al, 1987; Linder-Pelz, 1982; Williams, 1994). It is interesting to note that not only did the treatment site have a statistically lower satisfaction with nursing care but there was also a statistically significant difference between expectation and experience of nursing care. Avis et al (1995) states that patients judge themselves satisfied when they have met their expectations.

5.2.1.3. Hypothesis six

Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have a statistically significantly higher opinion of their own physical health post-operatively compared with a similar group of patients who receive traditional care.

Hypothesis six was accepted as overall the research subjects on the treatment site (one) reported that their return to physical health was slightly better than those from the comparison site. The findings suggest that the increased return to physical health was due to the ICP. It should be noted here that the summary score of physical health was compared with the SF-36 overall profile before drawing conclusions (as recommended by Ware and Kosinski, 2001). There were only a few studies avaliable in the ICP literature that included patients' opinions of their return to physical or mental health. Renholm et al. (2002), following a systematic review of the literature suggest that ICPs can lead to an improvement in the quality of health. The findings from Santamaria et al. (2002) concluded that there was a significantly higher emotional score in a fractured neck of femur ICP group compared with a traditional group of patients. In contrast, Sulch et al. (2002) reported that quality of life scores actually lowered with the introduction of an ICP in stroke rehabilitation care. It is difficult to draw direct comparisons from a stroke ICP that would be valuable for use in gynaecology. Stroke is an unplanned condition that usually requires rehabilitation, whereas a hysterectomy is an acute surgical procedure requiring minimal long term support. Erwin (2006) highlights that the examination of the relationship between satisfaction as a patient outcome and changes to patient health status has been lacking.

The transtheoretical model of behaviour change (Glanz et al, 2002; Prochaska and DiClemente, 1983) may help to explain why, seemingly, patients dissatisfied with nursing care feel that they have an improved physical health outcome. The transtheoretical model recognises that there are different stages to change and if outcomes are measured at different times there may be variation. The transtheoretical model construes change as a process involving progress through a series of six stages. Considering the different stages of change within the transtheoretical model specifically in relation to the outcome measures used in this study, two stages are highlighted as significant; the precontemplation stage and the action stage. The precontemplation stage suggests that people may be in this stage because they are uninformed about the consequences of their behaviour. From the ICP literature it is suggested that patients having care delivered with an ICP should have clearly identified goals and therefore be much more aware of their intended patient journey. The timeline for their return to physical health should be more explicit e.g. expectations may better match experience of physical health resulting in a more overall positive return to physical health. From the patients' opinion of nursing care perspective, the opposite was seen, in that the ICP (treatment) group felt less satisfied with their nursing care than the non ICP (comparison) group. The ICP directed nursing activities by a 24-hour care schedule in that it explicitly outlined for nursing staff what care should be provided at what time (based on expert local agreement). There appeared to be inflexibility for patients and staff to adjust the regime to fit the individual patient. However, when looking at the staff questionnaire results it is clear that staff felt that professional judgement was not challenged when using the ICP. The action stage recognises that people have made specific modification in their lifestyles to reach an end goal. For the purposes of this study, the action stage could be represented by the transferring of care from independence to dependence on nursing care. Perhaps the ICP (treatment) group had not appreciated the kind and level of nursing care required and therefore was not prepared for the specifics. One could speculate that although the ICP itself explicitly stated the steps to expect, that perhaps the nursing staff did not spend the time discussing the pathway the same as the non ICP group. Additionally the ICP was not transferred into a patient friendly format i.e. in layperson wording. It is therefore questionable as to how much of the detail for the specific days the patient would be able to interpret and ultimately aim to achieve.

5.2.1.4. Hypothesis nine

Gynaecology patients undergoing major abdominal surgery who have care administered using an ICP will have a statistically significantly shorter length of stay compared with a similar group of patients who receive traditional care.

Hypothesis nine was accepted as length of stay was reduced by nearly a complete day (0.87) on the treatment site compared to the comparison site. Length of stay was obtained through reviewing patient case notes, obtaining the admission, operation and discharge date and time. Documentation is required to be undertaken contemporaneously (NMC, 2004); however, it is recognised that on a busy acute ward, documentation is often completed after an event. The accuracy of the timing of the admission, operation and discharge could therefore be questionable. However, both sites' case notes were used for this part of data collection and both sites experienced a similar risk of error.

The reduction in length of stay was the single most clinically significant finding between the two sites. A reduction in length of stay has positive implications for patients, provider and the system (health care organisation). For the patient it means returning to their home sooner (providing the appropriate support structures are in place). From the provider and system (health care organisation) perspective it means that the bed space can be used more effeciently i.e. more patients can be treated within the same resources. The concept of reducing overall cost is discussed in further detail in relation to the findings from research question two and implications for the system (health care organisation).

Previously published studies on ICPs in the area of gynaecology surgery did support the concept that length of stay was reduced through the use of ICPs. Ghosh et al. (2001) concluded that length of stay was reduced to 3.4 days from 5.2 days (cervical cancer group) and 4.7 days (endometrial cancer group) for women undergoing a hysterectomy with an ICP compared with a simlar group of women without an ICP. Ghosh et al. also confirmed that there were no differences in re-admission rates. Chang and Lin (2003) support a reduction in length of stay reporting a drop from 6.9 days to 4.1 days when ICPs were used for laparascopically assisted vaginal hysterectomy. Renholm et al. (2002) concluded that a hysterectomy ICP reduced the cost of care through shorter length of stay and reduced use of tests (laboratory and radiology). Finally, Mukherjee et al. (2005) stated that an abdominal surgery ICP reduced hospital stay.

On reviewing the literature on ICPs in specialities other than gynaecology, the findings appear to be consistent with this study. Sweeney et al. (2002) stated that, through the introduction of an ICP for vascular surgery patients, there was improved effeciency and reduced length of stay resulting in a 25% cost saving. A study by Chang et al. (2005) resulted in a reduced length of stay from three to two days for prostatectomy surgery, complications were lower and re-admission rates were similar. Additional studies into the introduction of orthopeadic ICPs also supported the findings. Santamaria et al. (2002) reported a reduction of 3.3 days in the ICP group with fewer complications seen. Tarling et al. (2002) concluded a 33% reduction in length of stay, a 8% mortality drop and improvements in achieving some of the Royal college of Orthopaedic standards surrounding femur fracture. Controversially, Roberts et al. (2004) concluded that there was an increase in length of stay when a hip fracture ICP was introduced. The subjects were older, however, and the study did report an improvement in ambulation at discharge and a reduction in admission to long term care thereby resulting in an overall cost reduction from longer term nursing care. Interestingly, Young-Ju and Soeken (2005) supports the findings from Roberts et al. by stating that case management interventions were not significantly effective in reducing length of stay and re-admissions with the exception of patients with heart failure, where the opposite was found i.e. heart failure patients using ICPs reported a significant reduction in length of stay. The significance of these two later studies in relation to gynaecological surgery is unknown and therefore the difference in findings is of limited interest.

5.2.2. Implications for patients

The overall findings from research question one have significant clinical implications for patients. The ICP is argued to have a negative impact on the patient experience, a positive influence on their perception of their physical health and a reduction in overall length of stay. Clarke and Rosen (2001) suggest that there could be a 'right' length of stay, below which further reductions result in adverse effects on patient satisfaction due to public acceptability for a given procedure. Understanding what is an acceptable length of stay for patients may be the key to maintaining satisfaction with care. It is important to be able to shift the patient's experience of care to a more positive outcome, if ICPs are to be introduced further. Developing a patient friendly format of the ICP could be one mechanism of engaging patients and therefore improving their opinion of nursing care, as they would be more likely to know what to expect. Involving patients in the development phase of an ICP may be one way to achieve this.

5.2.2.1. Patient involvement

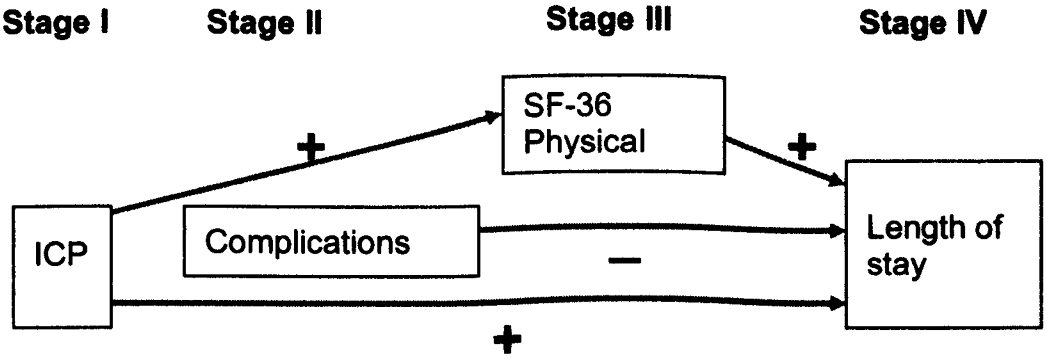
To date there is little evidence that patients have either been involved or consulted in the process of the ICP development throughout the NHS (Pinder et al., 2005). However, if ICPs are to be embraced by patients they must start to be involved in their development as they are a mechanism, to support a patient focused, flexible pathway to meet individual needs (Pinder et al., 2005). Patient involvement and choice are key driving forces within the modern NHS (Department of Health, 2004) and, therefore, should be considered when developing and introducing ICPs. From April 2005 (Department of Health, 2004) a new performance framework for the NHS was launched *'Standards for better health'* replacing the old star ratings assessment system. The new annual health check examines a broader range of issues with the focus on measuring what matters to people who use and provide health care services. The intention of the annual assessment is to ensure that health care organisations can best serve the patients and the public. The standards describe the level of quality that health care organisations are expected to meet in terms of seven domains; safety, clinical and cost effectiveness, governance, patient focus, accessible and responsive care, care environment and amenities, and public health. Within each domain there are core standards (setting a minimum level of service) and developmental standards (providing health care organisations with areas for improvement). Under the 'accessible and responsive care' domain the standard states that the views of patients, their carers and others should be sought and taken into account when designing, planning, delivering and improving health care services. Involving patient representatives on ICP development groups and using a language within the ICP that patients understand could be one mechanism for supporting patient involvement and choice. Involvement of patients at the development stage of an ICP could also have a positive impact on their satisfaction. The social psychological theories linked to obtaining patient opinion are discussed later in the chapter in relation to data collection.

5.2.3. Research question two

What factors including the use of an ICP contribute to the variance in patient length of stay for gynaecological patients?

To answer this question a model was developed and tested. A number of variables (Age, Townsend index, reason for surgery, presence of an ICP, presence of complications, SF-36 aggregated physical score, SF-36 aggregated mental score and experience of nursing care) were included in the model to explain the variance in length of patient stay. Additional or different variables could have been included in the model at different stages, as different variables had the potential to influence length of stay. However, the rationale for choice of variables was based on the literature review and testing the assumptions underlying multiple regression. Therefore only one final staged model was tested. The results of a hierarchical multiple regression analysis highlighted that only three of the variables contributed significantly to the variance in patient length of stay (presence of an ICP, presence of complications and the SF-36 aggregated physical score). Figure 25 provides an overview of the trimmed model.

Figure 25: Statistically significant trimmed model



Overall the variables ICP, presence of complications and perception of physical health explained 25% of the variance in length of stay. The SF-36 was collected at six weeks post operatively as this allowed return to physical health to be measured from the post operative period through to the follow up appointment at six weeks. It is questionable as to whether it was appropriate to place the SF-36 at stage III of the model since it was explaining length of stay variance and the SF-36 was collected at six weeks post discharge. The rationale for this was theoretical, in that the perception of an individual's health could influence their overall stay. The SF-36 tool was a valid and reliable measure for obtaining health status but needed to be collected at a minimum of four weeks discharge to obtain valid and reliable data (Jenkinson et al., 1996). This does raise a question of using the model in practice, as it is impossible to ascertain health status until well after the patient has been discharged home. In conducting future research, it is recommended that an alterative instrument be found for measuring patient's health perception within the immediate post operative period, or that the SF-36 is re-tested and validated for use within the period. An instrument that can be used to collect data within the immediate post operative period and provide accurate information regarding patient's health perception would be advantageous. A change in data collection instruments would mean that the model could be used in the actual practice setting. The remaining variance (75%) not accounted for by the model is due to non-specific variance, other variables that were not specified or not included in the model and error.

Using length of stay as an outcome variable is not new, with previous papers highlighting a number of variables that can influence it e.g. complications, physical mobility, satisfaction of care, age (Adder and Al-Motawa, 2005; Boyd and Groome, 1993; Clarke et al, 1996; Clarke and Rosen, 2001; Clarke, 2002; Hemsell, 1983; Hogston, 1994). On further examination of previous studies it appears to be the planning and timeliness of interventions that had an impact on length of stay. For example, Hempell et al (1983) suggest that the commencement of appropriate antibiotics and the appropriate time directly influenced length of stay. ICPs offer a mechanism to ensure patients are monitored in an accurate manner, therefore highlighting signs of infection earlier and directing treatment accordingly. Clarke (2002) suggests that appropriate health care is about the right care needs being provided in the right place, and therefore length of stay should not be reduced without consideration of the appropriate treatment patterns i.e. ICP.

This study provides a unique perspective of how the ICP contributes to the overall length of stay. There have been few other published papers on ICPs that included a multivariate analysis in their methodology. This study has, therefore, contributed substantial new knowledge to the existing evidence and information on ICPs. It is now possible to demonstrate the relationship of an ICP on other variables (either directly or indirectly) to determine the overall influence on length of stay. Being able to explain the influences on length of stay has significant implications for systems (health care organisations). Demonstrating the magnitude of variables that are important provides a clearer understanding of the effectiveness of ICPs.

5.2.3.1. Implications for the system (health care organisation)

Many health care organisations have successfully introduced ICPs with little empirical evidence or real evaluation of their effectiveness on clinical care. This study has contributed to the knowledge about ICPs as well as the significance of ICPs in clinical practice. The findings of the study have particular interest to the local NHS Trust in which the research study was carried out. Indications of the findings were presented to the gynaecology management team to assist with service developments. The findings from this research study also now provide health care staff, specifically in the field of gynaecology with some knowledge relating to outcomes at patient, provider and system (health care organisation) level where previously there was limited research evidence thus necessitating generalisation of findings from other specialities i.e. orthopaedics, surgical care.

Reviewing the findings in relation to cost also is valuable. Length of stay is only one proxy for cost; others include staff time, tests ordered, and procedures undertaken. However, considering length of stay alone, a significant cost saving would be realised. The NHS is under pressure to provide care within a given cost and timely manner. Recently this has been perpetuated by the introduction of payment by result (Department of Health, 2006). The tariff is a nationally determined price that is applied to clinical events dependent on which Health Resource Group (HRG) the episode of care falls within. HRGs are derived from procedure and diagnostic codes allocated by clinical coders based on information given to them (usually from within the clinical case notes). Other factors such age and co-morbidities play a part in determining the overall HRG. Additionally, individual providers have a market forces factor assigned to the tariff which affects the overall price. The consequences from introducing *payment by result* means that the providers are now paid for the activities they have actually undertaken. It is, therefore, essential for health care providers to deliver care within the tariff cost. A tariff is assigned to every procedure, treatment or activity and is the price paid for the activity undertaken. The tariff forms part of payment by result. The tariff for a hysterectomy falls into HRG M07 and equates to a full tariff of £2569 (based on information obtained from the finance general area/ reference costs 2006/2007). In practice, this means that for a hospital to achieve financial balance it must deliver the procedure within the set tariff cost. For an abdominal hysterectomy, this equates to providing the procedure, requesting only necessary investigations and discharging the patient as soon and safely possible. Additional costs including further investigations and an increase in length of stay leads directly to an increase in cost. The increase in cost is now paid for by the provider. ICPs offer a mechanism of ensuring effective capturing of procedure and diagnostic codes and allowing investigations and length of stay to be controlled and monitored, all of which provide the basis for delivering care within a set tariff. An average bed night costs approximately £527 (based on information obtained from the finance general area/ reference costs 2005) for a gynaecology inpatient at the research study site. The actual reduction in length of stay between the treatment and comparison site was 0.87days resulting in a saving of £458.49 per patient. The number of abdominal hysterectomies performed in the year April 2005 to March 2006 (information obtained from the finance general area) was 449. If ICPs were introduced for this procedure alone an estimated cost saving of £205,862 (£458.49 x 449) could be realised per year.

It also means that by using the ICP for abdominal hysterectomies the hospital will deliver care within the tariff price, and therefore reach financial balance. Length of stay remains an easily measurable index of efficiency and is quoted in the Department of Health NHS performance indicators (2002). The clear message from the Department of Health is that reductions in length of stay are expected to be achieved year on year and represent efficiency of local health services (Clarke, 2002). However, a reduction in length of stay may also cause an increase in expenditure since it may cause an increase in the number of high intensity days in hospital care i.e. the nurse patient ratio may need to increase. An additional consequence of an early discharge is for primary care. The patient potential could require higher support at home than through traditional times of discharge, for example, a district nurse visit to remove sutures, or a follow up GP appointment.

5.2.3.1.1. Department of Health developments

Since this study was conducted there have been, expectedly, various developments within the NHS with new policies to support the developments. However, the balance between quality and efficiency remains. The *NHS improvement plan* (Department of Health, 2004) set out three main areas in the government plans for modernisation of the NHS: Placing patients and service users first through more personalised care; focusing on the whole of the health and well-being of individuals and not only illness; and further devolution decision making to local organisations. The *NHS improvement plan* (Department of Health, 2004) highlighted quality and safety alongside delivering services efficiently, fairly and in a way that is personal to everyone. From a hospital Trust perspective, the devolution of power to local communities led to the development of Foundation Trusts. Foundation Trusts operate independently and are able to prioritise issues that are of local importance. There is a move away from nationally driven targets to where standards are the main driver for continuous improvements in quality. There is greater scope for addressing local priorities with incentives to support this. Bragato and Jacobs (2003) suggest that ICPs have been promoted as a mechanism to deliver part of the modernisation agenda within the NHS by reducing variability in care, costs and risks. Capacity and demand also remain a priority for all health care providers. Traditionally hospitals have attempted to solve their capacity problems with more beds, therefore increasing their supply of resources rather than managing their demand for care. Indeed, the *NHS improvement plan* (Department of Health, 2004) states that by 2008 NHS Foundation Trusts will be treating many more people. The notion of productivity is viewed in different terms and regarded through different sets of interest from those held by clinical staff and those held by management (Gibb and Banfield, 1996). ICPs can be seen as a mechanism to bridge this gap, and engage clinical staff in the productivity and efficiency agenda.

The *Health reform in England: updating and commissioning framework* (Department of Health, 2006) stated that the NHS needed to deliver care of the highest possible safety and quality in every place at every time, through honest and open information about outcomes. ICPs can be used to evaulate performance through length of stay, complications rates, re-admission rates and patient satisfaction (Smith, 2003). ICPs can be used to demonstrate specific standards are in place and can be reviewed through analysis of patient outcomes via variance analysis. Variance tracking is frequently reported within the literature, highlighting that information gained from variance tracking within ICPs can lead to benefits for administrators, practitioners and patients by revealing ways to improve outcomes and reduce costs. Variances can be collected at patient, provider and system (health care organisation) level but all require measurable outcomes or key elements. Aggregated variance analysis can support changes in practice that can improve patient outcomes, reduce length of stay and improve cost outcomes for the entire population (Benson et al., 2001). ICPs offer a mechanism to capture quality aspects of patient care in a manner that is auditable and sustainable and, therefore, allowing honest and open information about outcomes to be reviewed. Traditional variance analysis was not undertaken during this study as the primary focus was on determining if there were differences between groups (traditional and comparison group). All patients that were commenced on the ICP remained on the pathway until discharge.

5.2.4. Research question three

What are the opinions of the staff who have used the ICP of the ICP itself?

To answer this question descriptive exploratory data were reviewed from a staff questionnaire. Only 14 staff returned the questionnaire and, therefore, the results only represent 30% of the workforce. It is suggested that the low response rate is attributed to the researcher working in the clinical area and previously receiving feedback on the ICP in its development stages (as described in the development of the ICP, Chapter two). Due to the low response rate the results must be interpreted cautiously. Accepting response rates at 30% creates significant problems in using the data to generalise findings to the full population. Barkley and Furse (1996) compared two sets of questionnaire data to show how data at a low response rate can yield different results. However, determining an acceptable response rate level (from reviewing the literature) is difficult. Recommendations from Barkley and Furse (1996) were at 50% for the results to be used for making decisions about how hospitals utilise their quality improvement resources. The results produced therefore need cautious consideration in light of this. There was a split between the benefits and drawbacks of using the ICP from different professions however, within professions, very similar responses were seen indifferent to grade or position. In general, the nursing staff found the ICP easy to use and felt that it improved the clinical management of the patients. The medical staff found the ICP reduced the amount of time documenting care. Both professional groups (nursing and medical) felt that the ICP did not reduce or improve teamwork, reduce the quality of information or limit clinical judgement. However, all staff thought that the ICP supported teaching, audit and research activity. Overall, all the staff felt that the ICP had led to improved communication and appreciation of other professionals roles and responsibilities (particularly if the staff member was unavailable for direct communication regarding a specific patient).

Renholm et al. (2002) reported that communication between doctors and nurses improved with the introduction of an ICP for abdominal hysterectomy patients. De Luc (2000) had mixed results from her study, in that, positive comments were received from staff using an ICP with breast disease patients, but unfavourable comments were received from staff using a maternity ICP. The staff's main concerns when using the maternity ICP were around challenging the suggestion that the new ICP created less paperwork allowing more time to be given in direct patient care. The breast disease ICP was positive about improving multidisciplinary communication, setting and monitoring standards, and improving continuity of care. Hindle and Yazbeck (2005) undertook a survey of ICPs across 25 European Union countries in Australia, concluding that cultural aversion among doctors arises with the use of ICPs. The medical staff reported that the ICPs challenge clinical professional autonomy, and more needed to be undertaken in the education of staff as most health professionals only have a superficial understanding of ICPs at best. Although staff were not asked directly about professional autonomy they were asked about clinical judgement.

Atwall and Caldwell (2002) implemented a fractured neck of femur ICP and concentrated their evaluation on the multidisciplinary aspect of the ICP concluding that there was little evidence to suggest that inter-professional relationships and communication were enhanced. They went further to state that there were delays in discharge and felt that these were organisational failures rather than professional ones. It is highlighted by Zwarenstein and Bryant (2000) that a lack of nurse doctor collaboration contributes to problems in quality and efficiency of patient care. Zwarenstein and Bryant (2000) continue that there is growing dissatisfaction with fragmented health care with inter-professional communications, relationships and teamwork remaining poor. Zwarenstein and Bryant (2000) conclude that through the use of ICPs, collaboration is increased and outcomes of importance to patients and to health care managers are seen, thereby having a positive impact on health care outcomes. In 2004 Kinsman et al. reported on the implementation of an ICP for acute myocardial infarction patients. Their study focused on the involvement of key users to determine whether this had an impact on the use of the ICP. The results supported an increase in documented usage of the ICP. Kinsman et al. (2004) attributed the statistically significant finding to the fact that the ICP supported an interdisciplinary, truly collaborative and evidence based implementation process indicating that involvement of key users in the design and implementation of an ICP significantly increases staff utilisation of the document.

Inter-professional working is just one of the terms currently expressed in Government policy that not only shapes the structure of the NHS but also influences how professional groups work together. It is important to stress that inter-professional collaboration should not mean the surrender of a strong sense of professional identity derived from a shared value base. What is necessary is the ability to distinguish between value bases that create an identity that prohibits collaboration and one that facilitates it (Kenny, 2002). Important work has been done through the introduction of the ICP to increase professional understanding of collaboration. Challenging traditional boundaries for the benefits of patients takes time and support. ICPs provide caregivers with a common language and encourage everyone to look at the patient at the centre of the treatment. Smith (2003) suggests that ICPs can speed up multidisciplinary decision-making and therefore reduce complications.

Conclusions from the results of this phase of the study are limited due to the low number of responses. It is unclear whether those who did not respond were positive or negative about the ICP. Nobody approached the researcher during data collection to raise any concerns. It was clear however from the literature, that education of all staff prior to implementation appears to be crucial to the understanding and using of an ICP. Further research would need to be undertaken to understand fully the multidisciplinary staff's opinion of the ICP. Wider consideration should be given on ways to evaluate the effect of ICPs on staff in the future e.g. to individual follow up interviews, multidisciplinary discussions or focus groups.

5.2.4.1. Implications for staff

The literature is mixed on the impact of ICPs on the multidisciplinary team. It appears that by engaging all of the staff in the development and implementation of an ICP communications are at the least not reduced (Atwell and Coldwell, 2002) and in some cases improved (Renholm et al., 2002; De Luc, 2000). Benson et al. (2001) suggest that ICPs can support evidence-based practice by ensuring the latest practices are included e.g. Identify the removal of the catheter at 6am on the first post operative day in the list of daily activities.

5.2.4.1.1. Evidence based practice

The abdominal surgery ICP was developed locally on agreement of existing practice and supporting local guidelines and protocols (as outlined in chapter one). The decision only to standardise care through local agreement was agreed by the project group. The rationale for this was due to the fact that, until the ICP development, care had previously been provided based on individual medical and nursing staff preference. To obtain a consensus between local medical and nursing staff for the specifics within the ICP was seen as a positive way forward. Therefore the use of evidence from a critical appraisal of the literature for specific activities was not undertaken. In hindsight using the ICP to challenge existing practice and embed new evidence into practice would have been beneficial. Future ICP development should involve incorporating evidence based practice from published literature and not solely rely on local expert opinion and guidelines.

5.3. Overall comparison of the findings with the literature

The literature highlights that ICP developments are as varied as patient care. Case management is a fluid term with different authors using it in different ways. The term ICP sometimes leads to confusion, and the search for relevant literature is difficult. Following an extensive review of the literature following commencement of data collection there remains a limited amount of quantitative literature around the evaluation of ICPs. The majority of publications remain from the 1990s and have concentrated on the development of ICPs. The newer studies are concerned with analysis of cost in relation to the introduction of an ICP and have therefore involved collecting data on specific variances e.g.

antibiotic cover (Renholm et al., 2002; Chang and Lin, 2003). Higher frequency of specific assessments and communication e.g. nutrition, inattention testing, documentation of the provision of certain information and early discharge notification to the General Practitioner were also recorded and reported by Sulch et al. (2002).

Other studies have focused on specific clinical activities within the overall pathway. However, the clinical implications are mixed, with some reporting improvements in quality of care (Broder and Bovone, 2002; De Luc, 2000; Hankey, 2003; Mulherjee et al., 2005; Santamaria et al., 2003) whilst others argue there have been no improvements (Kwan and Sandercock, 2002; Young and Soeken, 2005), and in some cases a reduction (De Luc, 2000; Sulch et al., 2002). Some of the positives include: a reduction in the time for the need of an in-dwelling urethral catheter, an improvement in the return to normal diet and more frequent pain assessments (Broder and Bovone, 2002); patients are less likely to suffer a urinary tract infection and more likely to have a brain CT scan (Hankey, 2003); early ambulation and early introduction of oral fluids and diet (Mulherjee et al., 2005). Two studies (Hankey, 2003; Kwan and Sandercock, 2002) included death as a variance that resulted in no difference between the ICP and traditional group.

Herck et al. (2004) reported on a Medline-based review of the literature published between 2000 to 2002 on ICPs; 200 articles were selected and which when analysed, reported details on clinical outcomes (65.5%), financial interest (63%), process effects (50%) and service effects (18.5%). Most authors showed interest in length of stay and costs. Herck et al. (2004) concluded that in spite of methodological objections about studies in assessing the use of ICPs, there was strong evidence that ICPs resulted in a positive effect on clinical outcomes, financial interest, process effects or service effections. However most studies concluded positive effects from the implementation of ICPs.

There remains continued worldwide interest and use of ICPs in health care. It is understandable that many acute providers in the UK are adopting ICPs in a wide variety of specialties, as they support many of the NHS priorities including financial balance. It is worth noting that Fisher and Mcmillan (2004) identified that 86% of NHS Trust's in the UK have ICPs in use (although the median number per Trust was only two). The implications from this current study in relation to practice, research and education are of significant importance however, before addressing these it is important to reflect on the theoretical model used to underpin the study and address the study's limitations.

5.4. Theoretical modelling review

The Holzemer systems framework (1994) provided a useful tool in which to theorise the linkage between the variables within this study. Evaluating complex interventions is difficult because of the problems in identifying and separately assessing the effects of various components of the intervention (Blackwood, 2006). Table 31 provides an overview of the variables for structure, process and outcome at the client, provider or setting level.

Table 31: Theoretical model for study

	Structure	Process	Outcome
Client	Family support Age Social status Morbidity status	Educational level Expectation of nursing care	Functional status, quality of life measure, satisfaction with nursing care
Provider	Staff knowledge base Staff experience	ICP Traditional methods of care delivery	Staff satisfaction of ICP
Setting	Policies, procedures, guidelines Equipment Financial resources	Staff mix Staff levels Patient acuity	Length of stay Readmission rates

Agreeing on where something belonged i.e. process or outcome was a matter of judgement in relation to the specific research study. The use of the classification revealed conceptual and functional relationships. One such relationship was the tendency of the same kinds of outcomes to appear in many positions of the classification.

Establishing a causal linkage between process of care and outcome is difficult. An outcome is not simply a measure of health but it is a change in a patient's current and future health status that can be confidently attributed to an antecedent care (Donabedian, 1966; 1980). The outcomes of care should be compared with the individual objectives for care, which are necessarily patient and problem specific (Bond and Thomas, 1991). The secret of the success of change management is the interaction between the circumstances and the method (Donabedian, 2003). Rice et al. (2007) highlight that there is increasing evidence in the literature that patient outcome is strongly linked to nursing performance and that the independent decisions nurses make regarding the assessment, treatment and nursing interventions performed on patients have a significant impact on quality of care. Indeed, some studies have shown that the quality of nursing care can be as important as medical care in preventing unnecessary mortality (Chang et al., 2002).

Developing an understanding of relationships is important because it helps to connect knowledge held at an individual level with decision-making at a collective/ organisational level (Smith and Ross, 2007). Establishing suitable criteria by which to assess the process and outcomes of service users is challenging because different people hold different views. Table 32 provides an overview of the data collection instruments used to obtain data for the variables at client, provider and setting level.

Table 32: Specific variables included in the study

	Structure	Process	Outcome
Client	Support on discharge Age Townsend score Co-morbidity status	Age completed full time education Expectation of nursing care	SF-36 quality of life measure (physical and mental aggregated score) Experience and satisfaction with nursing care
Provider	Staff skill mix Staff qualifications Staff experience	ICP/ traditional methods of care delivery	Staff satisfaction of ICP
Setting	Policies, procedures and guidelines Equipment available Financial resources	Staff skill mix Staffing levels Patient acuity	Length of stay Presence of complications Re-admission to hospital within 30 days of discharge

Interventions aimed at producing change in the delivery and organisation of health care service requires rigorous evaluation to demonstrate their effectiveness. Evaluation poses difficulties, however, because these interventions are usually very complex (Blackwood, 2006). The factors that are likely to influence effectiveness fall into two categories: those that are contextual and those that are operational.

Previous studies, which have examined the effects of different ways of organising staff, have used patient outcomes as well as staff to determine the effectiveness of the change. Additionally studies that evaluated new ways of providing care also used patient outcomes (Bond and Thomas, 1991). The significant associations between length of stay, ICP, complications and perception of return to physical health represent the link between process and outcome.

I hypothesised that the ICP (as an independent predictor) would improve patient outcomes. The ICP facilitates multidisciplinary collaboration and communication. Multidisciplinary collaboration will continue to be a leading improvement strategy in health care. The need to reduce cost, improve patient safety and outcomes will make multidisciplinary work an essential part of every organisation (Grace, 2003).

Health care providers are currently witnessing a movement toward greater patient involvement in health care services. As patients become more involved in health care, they seek out health care providers who encourage this participation. Previous research suggests that increased levels of patient involvement in health care leads to improved system (health care) outcomes. When there is a mismatch between the perceptions of the health care provider and the perceptions of the patients concerning the extent of the patient's involvement in the care, health care outcomes may become affected. As a result, patients may become dissatisfied with health care services (Kimppainen et al., 1999). Those developing ICPs argue that both staff opinion and patient experience should be considered. Satisfaction is a patient focused outcome that has been used to evaluate the effectiveness of nursing care (with the different methods of organisation). There has been a move towards including patient's real and perceived expectations of care in assessing quality (Smith and Ross, 2007). Erwin (2006) states that patient satisfaction may be a pre-requisite to improved health status but by itself as an outcome does not inform nurses about how to improve the quality of care. Patient experience is used to emphasise a service users unique experience of their health care. This is one source of information from which knowledge may be developed. At a fundamental level understanding patients' experiences of their interactions with health services may help to build quality from within and taking service users views into account may lead to better targeted and more effective services based on needs identified by patients themselves (Gott et al., 2000).

The adapted framework from Holzemer (1994) was helpful in conceptualising the variables that influence outcomes at the client, provider and systems level and determine if they were structure, process or outcome variables. However, no other studies into ICPs have used such a framework so it is worth reflecting on its usefulness. Holzemer's work has its origins in HIV/ AIDS work and the robustness of his model in this area is clear. Translating the framework to be meaningful for another clinical study has been relatively straightforward, as the framework is clearly set out and easily interpreted. The difficulty faced with ICP research is the number of variables that could potentially influence patient care.

The framework provided the tool to conceptualise the variables (and therefore data collection instruments) into one of the nine categories (see Tables 31 & 32). There is a tendency to gather data on every possible variable and thereby dilute the effect of the significant ones. The model, however, allowed reflection on the number of variables within the specific domains and also supported the linkage between process and outcome. It would be interesting, in future research, to use the newly adapted model within a different clinical setting to test if the correct variables are included and that they are placed in the correct domain. The framework supports the overall assumption that multidisciplinary care leads to improved outcomes (at patient and system level).

The model supported the translation of the study's complex underpinning theory into an easily interpretable structure. With the NHS, moving towards patient involvement, researchers must find ways to engage the public and indeed the patients included in the specific studies. Holzemer's model offers the opportunity for patients to gain a greater understanding of the study without needing to understand complex research terminology and, thereby, possibly influence where the variables are places or indeed included.

Theories of integrated care stress the redesign of the steps in providing care. Change is often better achieved by redesigning multidisciplinary care processes than by influencing professional decision-making. A better use of theoretical assumptions to develop and test plans and interventions to improve patient care may improve our understanding. Future studies on change interventions need to focus more on applying specific theories of change to health care. The use of theory can offer a generalisable framework for considering effectiveness across different clinical conditions and settings (Eccles et al., 2005).

5.5. Limitations

The limitations are perceived as restrictions that may prevent generalisability of the findings and thus limit their credibility. Limitations of the study are described in relation to research design, recruitment, sample differences and generalisability. Factors that may potentially compromise the study results are related to the researcher status, social context, history and maturation of the group and observer variables and effects. Only a small project team supported the study. Data collection and overall responsibility for the study lay with one researcher. The implications for bias are minimal due to sensitive, valid and reliable data collection instruments being used. Issues regarding history and maturation had been addressed within the design of the study with regard to the collection of as many dependant variables as possible. It is acknowledged that this was an investigation into human subjects and therefore individual behaviour may have been influenced by other means e.g. previous experience of the hospital, feedback from friends or relatives who had used the hospital. Limitation in relation to the research design, recruitment, sample differences and generalisability follows.

5.5.1. Research design

The choice of design selected for the study was influenced by the nature of the research. A critical review of the literature into ICPs highlighted a gap in knowledge around quantifiable outcomes. Additionally, at a local level, there was a need to agree which method of care planning and delivery should be pursued at the new site. The decision to either support ICPs or traditional methods needed to be based on sound scientific rationale. As such a mixed design appeared to be the most appropriate method to answer the three specific research questions.

Research question one used a quasi experimental design as there was an intervention (ICP) that needed to be tested in relation to different outcomes. The lack of pre-test remains a serious impediment to defining change as it is impossible rule out that the differences in outcomes between the two groups may be a result of the site. It would have been invaluable to determine a baseline for both sites prior to the introduction of the ICP. However, attempts were made to ensure that the results were as a consequence of the independent variable (ICP), which includes issues regarding causality and consistency. The two groups were also examined for equivalence (as discussed earlier).

Simply because there appears to be a relationship between variables, does not mean one caused the other; the relationship may be due to chance or to a third variable. The randomised control trial is generally acknowledged as the gold standard to establish cause and effect (Blackwood, 2006). For interventions with single components standardising the intervention is easily achieved, for example, defining the optimal does of the new drug to be delivered and comparing this to a placebo or the current standard alternative. However, standardisation is more difficult in interventions aimed at changing behaviours in health care systems and naturalistic settings as they consist of multiple interrelated and interdependent components. It is becoming increasingly evident that mixed methods are essential when evaluating complex interventions (Lindsay, 2004; Victoria et al., 2004).

For the second research question a descriptive correlational design was employed, and for the third research question a descriptive exploratory design was used.

The descriptive correlation design provided the opportunity to consider the strength of the relationship of some independent variables on the dependent variable, length of stay. The limitations of using descriptive correlation again confirm the difficulties in explaining casual effects. The design does allow predictions to be made about what variables influence length of stay (the dependent variable in this study). Because the correlation between two variables is rarely perfect, it is often desirable to include more than one variable in the analysis. The choice of variables obviously is imperative. As previously discussed the independent variables thought to influence the dependent variable length of stay were chosen due to prior research findings, professional judgement and whether there were statistically significant differences in potential independent variables between the two sites.

Finally, the descriptive exploratory design was an attempt to highlight the personal aspect of care planning and delivery and to demonstrate the response and perceptions of the individual staff as they experienced using the ICP. As such, the methods used for this part of data collection were not as rigorous as those recommended by ethnographers and thus may be considered a limitation of the study. The staff questionnaires also did not yield a high response rate and so findings were interpreted cautiously. The staff data were analysed using descriptive statistics to organise, summarise and describe the data. It is important therefore to view the qualitative data as complementing the statistical evidence as opposed to stand-alone research. Future research could be directed toward determining a better understanding of the staff perspective of the ICP e.g. through group evaluation, focus groups or individual interviews.

5.5.2. Patient recruitment

Prior to commencement of the study it was anticipated that recruitment of an adequate number of research subjects would not be a problem. In the year previous to the study, 422 abdominal hysterectomies had been performed. Both sites were due to merge into one new hospital site on an agreed date. Therefore recruitment commenced a full six months prior to the merger to ensure enough subjects could be recruited to the study; however, on reflection the group sample sizes were not comparable due to activity being significantly reduced three months prior to the planned merger date. Additionally, a pilot of five research subjects was required to test the new expectation questionnaire and these patients could not be included in the final group for analysis. On reflection, data collection should have commenced earlier to allow an increased availability of research subjects. However, this was not feasible as there was no opportunity to extend the end date of data collection as both the treatment and comparison site closed and moved to the new site.

5.5.3. Patient sample size

There are two potential errors that can be made by a researcher in terms of accepting or rejecting the null hypothesis. To reject the null hypothesis when it is true (Type I error) or to accept the null hypothesis when it is false (Type II error). A power of 0.80 and a significance level of alpha ≤ 0.05 was set apriori to data collection. To determine the size of the groups for the research study a power calculation was performed (as demonstrated in the methods chapter) resulting in a sample size of 128 patients (64 from each site). A slightly reduced power of 0.79 was achieved due to the reduced sample size (122 patients in total, 61 from each site) increasing the likelihood of a Type II error. The increased likelihood of accepting a null hypothesis (Type II error) remains low and therefore should not significantly challenge the findings. The results with a statistical significance of ≤0.05 are discussed in relation to the literature as it is these results that the researcher can be reasonably confident are due to the treatment (intervention) variable (ICP). The clinical significance of the results is also discussed in relation of their magnitude to practice and from previously published literature.

5.5.4. Patient data collection

The growing demand in subjective measurements of health in clinical studies has encouraged the rapid creation of many new instruments. Maintaining the quality of measures and using them in a setting for which they were designed are important. The instruments used for this study have been previously tested and critically appraised in the methods chapter. Questions are blunt measurement tools at the best of times, the same phases will be interpreted differently by different respondents (McDowell and Jenkinson, 1996). The previous sections of this thesis clearly described the purpose for the measurement. The Cronbach's alpha was reviewed with the current study population.

There are no clear-cut answers to the question of when, where and how to best obtain patients' opinion as all are believed to influence both response rate and bias of responses (Bond and Thomas, 1992). However, certain options do seem more effective. Different measurement methods may provide very different results (Ross et al., 1995). The ideal would be to conduct multiple sessions with patients, acknowledging that events may recede in importance as new concerns arise, that things may genuinely be forgotten, and that feelings and opinions may develop (French, 1981).

A number of 'social-psychological' elements may affect expression of patient responses. Social desirability response bias exemplifies that patients may report greater satisfaction than they actually feel because they believe positive comments are more acceptable to the survey administrator. Similarly, ingratiating response bias occurs when a patient uses the survey to integrate themselves with researchers or the multidisciplinary team. Relating to ingratiating bias 'self interest' which proposes that because health services act as providers, patients are more likely to perceive that expression of satisfaction will contribute to the continuation of the service which in turn will be in their own self-interest. A further factor is predicted as cognitive consistency theory, in which patients report they are satisfied as a way of justifying the time and effort they themselves have invested in their treatment (Sitzia and Wood, 1997).

One of the main arguments against interviewing or distributing questionnaires in hospital is that there is a lack of privacy and a fear of repercussions from the staff. Alternatively there is the proposition that patients who have been treated and return home feeling better develop a halo effect due to feeling grateful. However, some argue (Houston and Pasanen, 1972; Raphael, 1977) that patients are more critical while still in hospital. There is little evidence as to which location seems more favourable.

5.5.5. Attrition of patient sample

Attrition in any study can become problematic and may potentially compromise the study (Polit and Hungler, 1997). The study maintained all 122 recruited patients throughout. The low attrition within both groups would support the concept of developing rapport with the research subjects including the 'get well soon card' (Appendix 22). Additionally the timing of the follow up questionnaires may have also had a positive influence as the questionnaires were distributed and collected at planned appointments, therefore not requiring additional appointments. The questionnaires were completed during the time in which the patient would have traditionally just waited to see the medical consultant. Attrition was not seen as a problem with the study group. Missing data were an issue however as the number of completed questionnaires available for analysis decreased to 121 for expectation of nursing care, 110 for experience of nursing care and satisfaction with nursing care and 107 for the SF-36. For all the questionnaires these decreases were equally split between the two sites.

5.5.6. Differences in patient sample

A statistically significant difference existed between the two (treatment and comparison) sites on three variables (age, Townsend index and operation performed). However, in terms of clinical significance, the differences are arguably less important. Firstly, the age for all research subjects ranged from 30 years to 79 years with a mean age of 43.45 years. Research subjects from the treatment site (one) had an average mean age of 41.73 years, compared with their counterparts from the comparison site (two) of 46.6 years. The difference between the two sites mean ages was just under five years and placed both groups mean age in the middle age bracket. From clinical experience, it is suggested that a difference of only five years would not influence patient outcomes. The second difference seen between the two sites was in relation to the Townsend index (demonstrating socio-economic status) demonstrates a lower socio-economic status in the comparison group compared with the treatment site. Although there was a difference, both groups fell within the average grouping for Townsend, and therefore can also be seen as comparable. The results from testing the theoretical model (to answer research question two) highlighted that both age and Townsend index were removed as neither had a direct or indirect influence on length of stay. Finally, the third difference seen between the two groups was in relation to the operation performed. From clinical experience it is argued that any difference in operations should not clinically affect patient outcomes due to them being comparable in magnitude and recovery time. A more reliable variable in relation to influencing other outcomes was the incision performed as this influences post-operative care. No differences were seen between the two sites on incision performed.

5.5.7. Staff data

Surgeon variability could have influenced the overall outcome. There were no differences in the surgeon's theatre list time for specific procedures or number of incidents. Both sites had comparable surgeons i.e. similar age and experience range. Boyd and Groome (1993) undertook a study to review the factors that influenced morbidity of abdominal hysterectomy patients, concluding that the rate for postoperative morbidity was not significantly affected by years in practice or speciality of the surgeon but was influenced by the hospital size. As previously discussed, the treatment and comparison site used within this study are comparable. There are limitations in virtually all instruments (McDowell and Jenkinson (1996), but developing a new data collection instrument always raises further concerns. The difficulty of writing questions that are clear and understood in a similar manner by all respondents cannot be underestimated. Although the staff questionnaire had been developed locally it had been used in a previous study (Debbage, 1997). The staff completing the questionnaire had previously been given the opportunity to seek clarification resulting in no staff member approaching the research lead. It was deduced that all the multidisciplinary staff were comfortable with the questions. Unfortunately the sample size for the staff data was small, due to the low response rates. Staff were prompted by e-mail and posters in the staff room. Additionally data were only collected from the treatment site on staff's opinion of the ICP. It would have been useful to obtain staff's opinion of the traditional methods of care planning also.

5.5.8. Generalisability

How far generalisations can be made is a question of much debate. Inevitably, with any single centred study the question of generalisability will be challenged. Care was taken to ensure validity in terms of design and statistical procedures, consistency and reliability of measures. An important element of external validity is the replicability of the study. This study has been presented in a manner that would allow other researchers to replicate it. Such presentations have involved describing and discussing the study through local and national conferences.

Clear inclusion and exclusion criteria were used for recruiting the research subjects. The recommendations, therefore, are only suitable to a similar patient group i.e. non-malignant case. Perhaps it would have been more appropriate to offer access to every level of patient, which would have given a truer reflection of reality. However, a decision not to widen the criteria based upon sampling theory (i.e. keeping the two groups as comparable as possible); previously published literature in the field of ICPs and expert knowledge was taken. A reflection on the reduction in length of stay with other authors confirms that the results from this study are not out of the ordinary, and therefore some generalisability is a possibility within the UK.

5.6. Implications and recommendations

The ICP showed a positive effect on reducing the length of stay, the patient's opinion of their return to pre-morbid function, but a negative effect on overall patient satisfaction. Additionally, a positive effect on the patients experience from expectation of nursing care was found.

Zander first introduced the concept of ICPs into the medical literature in 1988. However, prior to this research study taking place the literature surrounding ICPs consisted of very little with regard to empirical research, with the majority being anecdotal together with minimal methodological underpinning. Some attempts were made to suggest the potential benefits through the introduction of ICPs but many authors made vague reference to how this was quantified. The recommendations were generally unsubstantiated and contained little or no evidence on which to base practice. The literature consisted mainly of personal experiences from the staff viewpoint and little time was afforded to the outcomes at patient or system (health care organisational) level. The present study extends the knowledge to include some quantifiable data around the effect that ICPs have on patient, provider and systems (health care organisations). The recommendations are discussed in relation to clinical practice, research and education. The current research study provides health care staff and managers with knowledge about implementation of ICPs for women undergoing gynaecological surgery and perhaps a foundation for developing ICPs for other clinical conditions.

5.6.1. Implications for clinical practice

From reviewing the findings in light of other literature on the subject of ICPs various recommendations can be drawn. Health care organisations often do not have processes in place to support clinical staff through a systematic approach to develop ICPs. The development of a framework to guide inquiry will have a positive impact on patients and may foster a higher level of professional engagement by nurses and medical staff. Evidence based practice needs to be considered as the foundations on which an ICP is developed if they are to support improvements in care delivery. With the development and introduction of ICPs, all health care staff need to be aware that ICPs are not suitable for all patients and that clinical judgement or professional opinion should not be substituted. Support, education and engagement of the multidisciplinary team are fundamental to the success of any ICPs. A consistent finding in articles on improving quality in health care is that change is difficult to achieve. According to Grol et al. (2007) the majority of interventions are targeted at health care professionals, but success in achieving change is influenced by factors other than those relating to individual professionals. Teamwork has been recognised as important in achieving organisational aims as it tackles fragmentation of care and generally improves patients' quality of care (Grol et al., 2007). The success of teams relies on them working toward a common and clear goal. Studies in hospitals found that better team functioning was significantly associated with lower mortality rates (Wheelan et al., 2003) and a reduction in the mean length of stay for surgical patients (Friedman and Berger, 2004).

One of the negative outcomes highlighted from this study was in relation to patient satisfaction. It should be noted that the treatment site (with the lower satisfaction score) had an overall lower social deprivation score (using the Townsend index) and a lower age. It is stated however, that there are few consistent relationships between measured satisfaction and any socio-economic characteristics (Carr-Hill, 1992). It is unclear as to whether some of the decrease in satisfaction was due to the patient being discharged early. Nurses need to involve patients more closely in the discharge planning phase to ensure patients feel supported. Nursing staff might consider follow up telephone calls for patients that are discharged early, thus ensuring some support at home. Additionally, identifying whether there were any transfer of costs to primary care due to an earlier discharge need further consideration.

Overall, an ICP provides an opportunity for health care managers to understand complex patient pathways and associated costs with specific interventions and tests. The ICP, therefore, bridges the gap between clinical practice and health care resource issues, allowing clinicians and managers to plan productive episodes of care.

5.6.1.1. Summary of implications for clinical practice

- ICPs need to be developed on evidence based practice
- Consultation and engagement of the wider multidisciplinary team is essential if ICPs are to be introduced safely and effectively
- There needs to be consideration around the implications of earlier discharge from hospital
- There needs to be consideration around whether there are any additional costs in primary care from an early discharge

5.6.2. Implications for patients

As the economic and social climate continue to favour competition in health care, patient satisfaction will remain an important factor for attracting patients (Erwin, 2006). Patient choice and public involvement are fundamental elements of the new NHS (Department of Health, 2004) and as such, patients should be engaged in future ICP developments. Patient participation is not a new concept but its adoption in care was most pronounced during the 1980s when the government recommended that views and wishes of consumers should be taken into account when planning and delivering health care (Department of health, 1989). There have been many definitions and interpretations in the literature, and the concept of patient participation is indeed extremely complex and multifactorial in nature. Cahill (1998) states that the literature appears to suggest that patient participation is one of nursing's most amorphous and ill described concepts. Historically the accepted assumption about health care was that illness could only be effectively diagnosed and treated by expert professionals. Patients were regarded as passive recipients of care and decisions regarding their care were in the domain of the medical staff (Cahill, 1998).

Interestingly, attitude towards patient participation is different within the UK compared to the USA (Biley, 1992). This is attributed to the fact that patient participation has been operationalised in the USA for a longer period of time. It is worth considering that ICPs originated from the USA and the cultural context is suggestive of being different, maybe explaining why satisfaction has been reduced in this study. However, the entry of the consumerism ethos into the UK health care system has led patients to become more actively involved in the provision of health care (Beardshaw and Robinson, 1990). Patient participation in care is based on the assumption that patients want and benefit from having a more active role in their health status (CaHill, 1989). However the degree of participation may vary in accordance with the patient's condition. Beicecker (1988) found that older patients and those more seriously ill preferred a less active role in decision making. Generally it would appear that all patients prefer to participate in their care, however the level of engagement needs to be assessed on an individual basis. One way to support the engagement of patients in the specifics of their care is to develop a patient friendly version of the ICP. The Department of Health (1999; 2004) remains proactive in encouraging patient engagement and ICPs could be one mechanism to achieve this. Indeed an ambition of UK health care policy is to move the NHS from a service that does things to and for its patients to one that is patient led (Department of Health, 2005).

5.6.2.1. Summary of implications for patients

- Patient choice remains a key priority for the NHS
- Patient participation in development of services specifically ICPs is imperative
- Development of a patient friendly version of the ICP should be considered

5.6.3. Implications for nursing research

The findings of this study have significance for both nursing and health services research. There remains a serious concern over the lack of robust evidence around the effectiveness of ICPs. Previous work to date (excluding this study) has had small sample sizes that have not been tested for statistical significance.

There has also been little research in this area in other countries including USA, Australia and Europe. The methodology developed to test the ICP could be transferred to other ICPs and clinical settings as it was parsimonious. Understanding ICPs effectiveness remains a fairly new concept in the UK and this study could form a model for creating an evidence base for future ICP development and practice. Renholm et al. (2002) undertook a systematic review of the literature surrounding ICPs and concluded that the most widely used method in ICP research was retrospective patient chart review (n=31) looking at before and after the introduction of an ICP. The second most common methods were structured questionnaires (n=12) followed by a combination of patient chart review and structured questionnaires. The smallest groups of studies were interviewing patients or professionals (n=5) with very few studies on patient experience. The methodology and content of this study will potentially enable the researcher and others to expand and advance knowledge specifically in relation to developing models for testing other ICPs and broaden the range of data collection methods.

Whilst the present research demonstrates a positive effect on an important outcome, length of stay, it is important that this finding is kept in context with the negative finding of reducing patient satisfaction with nursing care. Additional research into patient satisfaction with nursing care would need to be considered. Future research should involve a pre-test prior to the introduction of an ICP to ensure that the results are conclusively related to the introduction of the treatment variable (ICP) as patient outcomes are influenced not only by the inputs of providers and systems but also many other factors including social and environmental influences. Nursing needs to invest in outcome research and establish the most effective and efficient care to maximise benefits to patients (Bond and Thomas, 1991). It would be interesting to replicate the study with a different patient group or on a different site. A more rigorous approach to obtaining staff opinion is required if ICPs are to be adopted for more procedures and treatments. Capturing additional data on perceptions of returning to health on immediate discharge from hospital would be also advantageous.

5.6.3.1. Summary of implications for nursing research

- Statistically significant results from this study (previously lacking in the published literature)
- The methodology is transferable to other settings and specialities with the addition of a pre-test
- Patient satisfaction was lower on the treatment site. There needs to be consideration as to how this can be monitored and improved with the continued use of ICPs

5.6.4. Implications for nurse education

Educators of all disciplines need to be aware of the developments of ICPs and ensure pre-registered students are educated appropriately in their use. Additionally, there needs to be regular post registration multidisciplinary education around the development and implementation of ICPs to ensure they are adopted and used appropriately. Equally the multidisciplinary team need to be aware of how variance evaluation (tracking) is essential in monitoring standards and changing practice. Clinicians developing ICPs need the support of individuals with critical appraisal skills to help identify and include the underpinning evidence base for practice used within the ICPs. Research educators need to support the development of complex staged models and the use of multiple regression techniques to determine contributing factors on dependant variables.

The wider implications of using ICPs for nursing as a profession include the move from a medical centred model of patient care to a more nurse led model of care. Nurses will be responsible for delivering the care outlined in the ICP (agreed locally by the multidisciplinary team) and only bring variation in expected patient care to the attention of the medical staff. Nursing staff therefore need to be educated in the principles of autonomous practice to ensure their practice reflects these principles.

5.6.4.1. Summary of implications for nurse education

- ICPs should be included in pre-registration programmes
- All staff need education on the use of variance tracking
- Critical appraisal skills need to be taught to ensure future ICPs are developed through evidence based practice
- Nursing staff need to be educated with regard to autonomous practice

5.7. Overall conclusions

The results obtained from this current study must be viewed with the limitations in mind. Conclusive evidence that supports the introduction and use of ICPs across all health care groups has not been found. However, there is evidence to suggest that with the correct support and implementation ICPs can have a positive impact on some patient and system outcomes. The abdominal surgery ICP supported improvements in cost and efficiency through a reduction in length of stay. An improvement in the patient's perception of their return to health was also seen when the ICP was used. Additionally, there was a significant difference from expectation to experience of nursing care within the ICP group. There was however a reduction in the patient's satisfaction with nursing care with the introduction of ICPs and this needs further study. Involving patients more collaboratively in discharge planning and future ICP developments could promote long-term patient satisfaction. Currently, there are relatively few published accounts of ICPs being developed in partnership with patients.

Whilst there are a number of studies in the field of ICPs, it was difficult to draw meaningful conclusions due to the limited quantitative methodologies used and the inconsistency of the actual ICPs. Having said that, the results from this study do support previous findings from other studies. Certainly the results obtained are equitable and as such represent the potential for further investigation. The major dependent variables included in this study tend to reflect the elements associated with ICPs in the wider literature. However other variables could have been beneficial to include e.g. further cost associated variables including laboratory tests, timing of specific interventions including commencement of anti-biotic cover and removal of catheters, and commencement of oral fluids and diet. Additionally, it would have been valuable to include variance analysis to gain an understanding of how much patients deviated from the specified pathway of care.

It is difficult to consider how change occurs in any organisation without recognition of the concept of power and power relationships within the multidisciplinary team and between the wider management team. Multidisciplinary collaboration will continue to be a leading improvement strategy in health care. The need to reduce cost, improve patient safety and outcomes, and increase job satisfaction will make multidisciplinary team work an essential part of every organisation. It is worth reflecting on the reduction in length of stay on the treatment site. Although comparable to with what other authors have reported (Chang and Lin, 2003; Chang et al., 2005; Ghosh et al., 2001; Mukherjee et al., 2005 Renholm et al., 2002; Santamaria et al., 2002; Sweeney et al., 2002) consideration should be given as to whether it was the ICP itself that led to a reduction in length of stay or whether indeed it was the process through which the ICP was developed i.e. critically reviewing all steps in a patient groups pathway, making these steps explicit and obtaining commitment from all the clinical staff. The effect of developing the ICP can be seen as analogous with the Hawthorne effect (Burns and Grove, 2005) only however, likely to have an effect on the staff and not the patients. Gibb and Banfield (1996) attributed the success of the ICP to the development process in their action research study of an ICP in Australia. Additionally, De Luc (2000) highlighted the difficulty in ascertaining whether it was the development of an ICP or the ICP itself that led to changes in practice. Documenting in the same place (i.e. the multidisciplinary team) may also lead to improvements in clinical care (Johnson, 1997; Tingle 1997 and Wilson, 1994). Health care managers must understand and appreciate the possible implications of not involving clinical staff in locally developments of ICPs. ICP projects have had great success, but they have met with failures too. Wales (2003) suggests that the failures are because of the way in which an ICP tool is developed and implemented. It is the process of team collaboration that ultimately produces quality outcomes and strong links in the continuum of care (Fox and Anderson, 1996).

Care planning and delivery is such a complex experience, many of the investigations into ICPs cannot clearly demonstrate their effectiveness on patient, provider and system (health care organisation) outcomes beyond any reasonable doubt. Methodological inadequacies, a lack of understanding of the whole patient experience, the complexity of the specific episode of care or the limitations associated with the measures available to determine an objective measurement are some of the examples of how other studies have failed. The current study has enabled some clarification that was required to support the clinical merger of two established units to one new central hospital. The conclusion that an ICP can have a positive effect on some patient, provider and system (health care organisational) outcomes is supported.

The delivery of health care today faces many varied challenges from both internal and external forces. External forces tend to be financial and politically driven, while internal factors come from the aging population and the advances in treatments and technologies available to patients, staff and stakeholders. Managers are faced with the challenge of cutting cost and reducing length of stay whilst maintaining quality aspects of care. Health care professionals on the other hand are primarily interested in delivering quality care rather than being concerned with cost. ICPs are one of the tools used to enhance outcomes and contain costs within constrained resources. The value of the ICP rests in the multidisciplinary nature of the tool and where the ICP is developed on local agreement and wherever possible evidence based practice. ICPs have much to offer the NHS modernisation agenda, as they can prompt and monitor evidence based practice, support review of outcomes (at the point of delivery), and reduce costs whilst maintaining quality aspects of care. ICPs provide the key to unlocking the national agenda for improved services, increased responsibility, through clinical governance, and an easy route into the information technology.

Holzemer (2007) highlighted that knowledge generated through nursing research should provide information for guiding nursing practice, enhancing patient outcomes and shaping healthcare policy. This research study has provided information for all three areas. Furthermore, it has challenged the traditional discussions of research methodology, such as quantitative and qualitative research to link the discrete data collection methods with a theoretical framework.

5.8. Conclusion

The purpose of this chapter has been to compare the findings from this research study with those obtained by other investigators within the field of ICPs. This study investigated the effect of an ICP on outcomes at patient, staff and system level using a theoretical framework based on Holzemer (1994). A critical review of the study's limitations was included. The study has put into context what the research means to clinical practice, nursing research and nurse education.

The single most significant finding (both statistically and clinically) is that of a reduction in overall length of stay at the site where the ICP was used. If ICPs were introduced for abdominal surgery within the gynaecology department where the study was undertaken an actual cost saving of £205, 862 would be realised during a 12 month period (if a similar number of operations were performed). If ICPs were developed and implemented for other procedures, treatments and operations there is the potential to make even bigger savings. Local health care providers must consider ways in which to maintain quality services whilst containing costs if they are to deliver health care within reference (tariff) costs (Department of Health, 2006). This study has demonstrated that ICPs are one way to deliver evidence based health care within a financially restricted system.

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