The Infection Prevention and Control Education of Nursing and Midwifery Students

A thesis submitted to the University of Manchester for the degree of Doctor of Philosophy (PhD) in the Faculty of Medical and Human Sciences

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Abstract

Introduction. Infection prevention and control is both a national and international priority, with compliance with precautions being sub-optimal. One of the reasons suggested for poor compliance is a lack of appropriate education for health care professionals. There is a limited body of research available which considers infection prevention and control education for nursing students, particularly in clinical placements and no identified research in this area in midwifery.

Aim. A body of research was undertaken with the overall aim of exploring and analysing the experiences and learning needs of nursing and midwifery students in relation to infection prevention and control in their clinical placements.

Methods. An interpretivist approach was utilised to undertake semi-structured interviews with 32 nursing students, 15 midwifery students and 31 nurse mentors within a body of research comprising of three related studies. Data were analysed using Framework Analysis.

Results. Several themes emerged from the body of work including the nature of infection prevention and control practice that is perceived as good or poor practice; attitudes towards infection prevention and control; barriers and motivators to learning about infection prevention and control; attitudes towards the infection prevention and control nurse and barriers to reporting poor practice.

Conclusions. The body of work presented has several implications for future practice and research. New knowledge has been developed in particular in relation to perceptions of the role of the infection prevention and control nurse, barriers to reporting poor practice, the infection prevention and control education of midwifery students and the acceptance of poor practice as the norm. By triangulating findings from three separate but related studies, the research has been strengthened, providing additional support for the conclusions reached.
Declarations

Title: The infection prevention and control education of nursing and midwifery students.

1. This thesis provides an account of my publications between 2010 and 2013 which report on research undertaken between 2008 and 2011. These publications demonstrate the development of a body of work focusing on the infection prevention and control education of pre-registration nursing and midwifery students. The thesis consists of 8 refereed journal papers which derive from 3 related empirical studies:

- 2008-2009 – Student nurses’ experiences of infection control in clinical placements: an interview study – Funded by the General Nursing Council Trust for England and Wales
- 2009-2010 – The infection control education needs of student nurses as perceived by their mentors: an interview study – Funded by the University of Manchester Pump Priming Initiative
- 2008 & 2011 – Student midwives’ experiences of infection control in clinical placements: an interview study – funded by the University of Manchester Pump Priming Initiative and the General Nursing Council Trust for England and Wales.

All but one of the papers presented are sole authorship.

2. This work has been wholly undertaken and completed whilst I have been an academic member of staff at The University of Manchester

3. No portion of this work has been previously submitted for a higher degree at this or any other university, or for any award by a professional body.

I confirm that this is a true statement and that, subject to my comments above, the submission is my own original work.

Signed: Date:
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Acknowledgements
I would like to thank my supervisor, Professor Nicky Cullum for her advice and support throughout the process of writing this thesis. I would also like to acknowledge the support of my father, my oncologist and my neurologist who were invaluable through difficult times.
Personal Statement
I have worked at the University of Manchester since 2007 working as a Lecturer in Infection Prevention and Control in the School of Nursing, Midwifery and Social Work. All the research discussed in this thesis was undertaken while employed at the University of Manchester.

*Previous degrees and professional qualifications:*

Postgraduate Certificate in Health Professional Education, University of Huddersfield 2010

MA Independent Practice (Health), University of Leeds 2004

BSc (Hons) Health Care Studies, University of Huddersfield, 1999

Registered General Nurse, Huddersfield School of Nursing, 1994
Rationale for undertaking a PhD by publication

This thesis is submitted in an alternative format and includes eight papers published in peer reviewed journals. There are several reasons for presenting the thesis in this format. Although the overarching aim of the research was to explore and analyse the experiences and learning needs of nursing and midwifery students in relation to infection prevention and control in their clinical placements, there are distinct findings which arise from the interviews undertaken with three groups of staff. I felt that it was important to disseminate my findings as soon as possible as papers which then led to production of this thesis as published papers with commentary. I consider that my findings have relevance for practitioners working in infection prevention and control, nurse education, nursing and midwifery students and educators in clinical settings. It is also appropriate practice to disseminate research findings to as wide an audience as possible to justify funding and the use of people in the research.

This thesis provides an account of my publications between 2010 and 2013, which reported on research undertaken between 2008 and 2011. These publications demonstrate the development of a body of work focusing on the infection prevention and control education of pre-registration nursing and midwifery students. The thesis consists of 8 refereed journal papers which derive from 3 related empirical studies:

1. 2008-2009 – Student nurses’ experiences of infection control in clinical placements: an interview study – Funded by the General Nursing Council Trust for England and Wales

2. 2009-2010 – The infection control education needs of student nurses as perceived by their mentors: an interview study – Funded by the University of Manchester pump priming initiative

Index of published work


The Rationale for Undertaking the Research

My interest in undertaking this research was stimulated by feedback from students that I was teaching in the university setting about infection prevention and control in their practice placements. The university setting is a structured environment, with infection prevention being taught in both lecture theatres and the clinical skills laboratory, linking
theory with simulated practice. We have little or no influence on students’ learning in
the clinical setting where they are exposed to real situations and real practice. The
general student consensus was that observed practice was frequently poor but that
sometimes students were unable to distinguish between good and bad practices once
they had observed incorrect practices in the clinical setting. I came to realise that while I
was aware of what was being taught about infection prevention and control by the
university, I was not clear about what was being learned in practice by the university’s
students. I therefore wanted to investigate this and applied for funding to enable me to
do this. After gaining insight into student views and experiences, I extended my interest
to the views and experiences of mentors as these are pivotal to the education of students
in practice.

The Empirical Studies

The first study aimed to consider the experiences of nursing and midwifery students in
clinical placements in terms of what they observed and learned about infection
prevention and control and how well prepared they felt in terms of university education
and skills training. A total of 31 nursing students and 9 midwifery students were
interviewed. This study, following the completion of the literature review, was
published in the Journal of Advanced Nursing (Paper 2) and considers students’
perceptions of good and inappropriate practices they had observed, their basis for these
judgements and reasons for not reporting poor practice. This journal required the use of
a nursing model to discuss the findings. King’s Conceptual Framework was chosen and
this is discussed in Chapter 4.

The second study is an interview study with nurse mentors (n=32). The interviews
focused on their views of students’ knowledge and skills in infection prevention and
control, students’ willingness to learn, their views of university education in this area
and attitudes towards both infection prevention and control and the infection prevention
and control nurse of students, staff and their organisation and the effects this might have
on student learning. Aspects of this study, combined with nursing student findings form
the aforementioned study, were published in Nurse Education Today (Paper 3)
education needs), the Journal of Nursing Management (Paper 4 - attitudes towards the
Infection Prevention and Control Nurse and how this might affect student learning) and BMJ Quality and safety (Paper 5 - attitudes towards infection prevention and control of both students and mentors and how these affect learning and practice).

In 2011, I made a decision to try shift the focus of this research towards midwifery as I felt that there were midwifery-specific issues in relation to infection prevention and control that had not been examined. Consequently I interviewed a further 6 midwifery students and the results of these interviews were synthesised with those of previous interviews and the data interrogated around the barriers and motivators to learning infection prevention and control in clinical placements in midwifery. This paper was published as Paper 7 in Nurse Education Today. I had originally applied the Theory of Planned Behaviour in this research however I was asked to remove this by the journal to keep within word limits; consequently I published a paper focusing on the application of the Theory of Planned Behaviour to infection prevention and control research with both nursing and midwifery students (Paper 6; Journal of Clinical Nursing). All studies were analysed using Framework Analysis and its application is discussed in a paper published in the Journal of Advanced Nursing (Paper 8).

The Nature of the Journals Chosen

The journals in which the papers were published all had impact factors (all from Thomson Reuters Journal Citation Reports 2014) and were academic, peer reviewed (rather than professional) journals.

Nurse Education Today, in which three of the papers were published is the most highly ranked (by impact factor) nurse education journal in the UK with an impact factor of 1.456. It aims to provide a forum for the publication of high quality original research, review and debate in the discussion of nursing, midwifery and interprofessional education.
Two of the papers were published in the Journal of Advanced Nursing which has an impact factor of 1.685. The overall aim of this journal is to inform practice and policy worldwide through research and scholarship. All papers in the journal are required to have a sound scientific, evidential, theoretical or philosophical base and to be critical, questioning and scholarly in approach. It is aimed at nurses and midwives working at all levels worldwide.

The Journal of Nursing Management is the most highly ranked nursing management journal by impact factor (1.142). It aims to provide an international forum which informs and advances the discipline of nursing management and leadership. It encourages scholarly debate and critical analysis resulting in a rich source of evidence which underpins the practice of management, innovation and leadership in nursing and health care.

The Journal of Clinical Nursing has an impact factor of 1.233. Its primary aim is to promote a high standard of clinically related scholarship which supports the practice and discipline of nursing. Emphasis is placed on promoting critical debate on the art and science of nursing practice and it is aimed at anyone involved in nursing practice internationally.

BMJ Quality and Safety has an impact factor of 3.281. It is aimed at academics, clinicians, healthcare managers and policy makers. It aims to encourage the science of improvement, debate and new thinking on improving the quality of health care and is an international journal.

Chapter Outline
Chapter 1 sets the scene by considering the impact of healthcare associated infection, non-compliance with infection prevention and control precautions and strategies to improve compliance with a particular emphasis on education.
Chapter 2 focuses on the methodology used throughout the research and critically considers the rationale for choices made during data collection and analysis.

Chapter 3 presents a précis of the published papers, providing an overview of each publication.

Chapter 4 focuses on the conceptual framework which underpins the thesis, focusing on King’s interacting systems model and the Theory of Planned Behaviour.

Chapter 5 is the final chapter and brings together the thesis and summarises the contribution of the research to knowledge in the field. Here, I also discuss the strengths and weaknesses of my work and highlight areas for future research.
Chapter 1 Introduction & Background

1.1 Infection Prevention and Control

1.1.1 Background and rates of compliance

Healthcare associated infection (HCAI) is a worldwide problem. It is estimated that 6.4% of hospitalised patients in England (Health Protection Agency 2012) and 7.1% in Europe develop HCAI and 37,000 people in Europe die as a consequence (European Centre for Disease Prevention and Control 2013). Between 15 and 30 percent of HCAI are thought to be avoidable through the application of existing interventions such as standard precautions (National Audit Office 2009). However, compliance with infection prevention and control precautions has been consistently highlighted to be low across a broad spectrum of precautions worldwide (Gammon et al 2008).

Standard precautions are seen as fundamental to the prevention and control of HCAI and are an effective way of protecting healthcare workers, patients and members of the public. However, it is widely acknowledged and has been identified in a systematic review that compliance with standard precautions is sub-optimal on an international basis (Gammon et al 2008).

Hand hygiene is the most important intervention in the control of cross-infection but levels of compliance can be poor (Bukhari et al 2011, Fuller et al 2011, Naderi et al 2012). In relation to glove use similarly poor compliance levels have been highlighted (Kuzu et al 2005, Chau et al 2011). There has also been a link established between glove use and hand hygiene compliance. Girou et al (2004), for example, in their observational study in France involving 120 healthcare workers identified that hand hygiene was not undertaken as a result of improper glove use in 64% of instances. Flores and Pevalin (2006) also reported that hand hygiene was adversely affected by the overuse of gloves on the basis of an observational study on 12 randomly selected wards. There is therefore a clear indication that staff see glove use as negating the need for hand hygiene when this is not the case. Poor compliance with standard precautions has been found to be a risk factor for sharps injuries, with the risk of injury almost doubling in the United Arab Emirates due to poor compliance (Jacob et al 2010). Compliance with isolation precautions has also been reported to be as low as 37% (Mash et al 2007).
When considering other less researched precautions, there are still low levels of good practice. In one study, only 46% of staff did not resheath needles after use and only 55% used eye protection when appropriate (McGaw et al 2012). It is clear, then, that compliance is universally sub-optimal. This can have a negative impact on rates of infection (Fendler et al 2002) with infection rates rising as practice deteriorates as demonstrated in a neonatal intensive care unit (LeMyre et al 2012). We therefore need to consider strategies which might improve practice and thereby reduce infection rates. There is strong evidence to confirm that compliance varies and that healthcare workers are selective in their application of infection prevention and control precautions. Poor levels of compliance have significant implications for patient and staff safety and quality of care and issues which affect or improve compliance therefore need to be considered.

1.1.2 Reasons for non-compliance with infection prevention and control precautions

The existing literature identifies many factors that impact on compliance with infection prevention and control precautions. A lack of knowledge, for example, has been reported to be associated with sub-optimal use of personal protective equipment with only 22% of staff having the correct knowledge about standard precautions (Timilshina et al 2011). A correlation has also been reported between knowledge and hand hygiene practices in nursing and medical students, with less knowledge leading to lower levels of compliance (Suchitra and Lakshmi Devi 2007, van de Mortel et al 2012, Sodhi et al 2013). There is, however, some confusion regarding whether improvements in knowledge increases levels of compliance with infection prevention and control precautions. DeJoy et al (2000), for example, reported that better knowledge predicted better general compliance with standard precautions. However, it was later found that theoretical knowledge of hand hygiene guidelines did not have any impact on hand hygiene practices (De Wandel et al 2010).

Other reasons for non-compliance reported in the literature include increased workload (Pittet et al 2004, Knoll et al 2010), poor risk perception (DeJoy et al 2000, Dinelli et al 2009, Chor et al 2012) and detrimental skin effects (Creedon 2005). The facilities available to support infection prevention and control practices have also been considered. A lack of appropriate facilities have been found to hinder compliance (Chelenyane and Endacott 2006), though no link has been found between the number of
facilities available and rates of hospital infection (Borg et al 2009). In contrast to this, however, Lankford et al (2003) reported that an increase in the number of hand hygiene basins did not improve hand washing compliance. It therefore seems that while we may be able to identify factors which adversely affect compliance, addressing these factors may not lead to positive changes in practice. This speaks to the implementation literature in infection prevention and control.

Despite the plethora of research identifying both poor compliance and reasons for non-compliance, compliance remains poor in infection prevention and control. One of the issues that may contribute to this is the lack of transfer of knowledge from research into practice. The failure to translate research into practice is one of the most consistent findings from clinical research (Grimshaw et al 2012) with a common finding being a gap between the best available evidence and clinical decision making (Curran et al 2011). While Grimshaw et al (2012) suggest that the basic unit of knowledge translation should be either systematic reviews or other types of syntheses of research findings, these are rare in infection prevention and control (NICE 2012) and there is therefore reliance on individual research studies or groups of studies which consider the same issues but which have not been systematically reviewed. To be successful, the transfer of research findings into clinical practice needs attention to barriers and facilitators which influence the knowledge-decision making gap. A lack of knowledge of research in infection prevention or a lack of understanding of this research may act as barriers. However, evidence-based clinical guidelines for infection prevention and control such as the Epic3 guidelines (Loveday et al 2014) and the NICE guidelines for primary care (NICE 2012) are based on a review of research evidence and the transfer is therefore already available in terms of guidelines to unpin policies. It is the implementation of these policies and guidelines into practice, then, which may be the issue. It does need to be acknowledged that one of the main barriers to the implementation of these guidelines might be the fact that most of the recommendations within them are based on expert opinion as opposed to research evidence. This may affect the perceptions of practitioners in relation to the evidence-base for practice. Sax et al (2013) have acknowledged that the implementation of evidence-based infection prevention and control practices is challenging worldwide. They identify factors which determine the success of improvement interventions including cultural, economic, political and
organisational. These aspects clearly need to be considered when planning ways in which we can improve practice.

Despite this implementation block, there is evidence that some interventions improve practice in infection prevention and control. One intervention universally demonstrated to improve hand hygiene compliance is the introduction of alcohol hand rub which has been shown to improve practice by up to 100% (Linam et al 2011, Scheithauer et al 2012). It has, however, been highlighted that the introduction of alcohol hand rub works better in terms of compliance when combined with behaviour modification techniques (Whitby et al 2008) which suggests a more multi-modal approach may be required, and it is unclear whether the use of alcohol hand rubs contributes to a reduction in rates of infection.

Other factors or interventions which promote compliance include a positive attitude towards infection prevention by health care staff (Askarian et al 2007, Takahashi et al 2009), though again there is conflict in research findings here in that positive attitudes towards a precaution do not necessarily lead to good levels of compliance with it (Burnett 2009, McGaw et al 2012). Attitude and its effects on compliance are therefore areas worthy of future study.

It has been reported that hand hygiene can be enhanced through peer monitoring and feedback (Langston 2011). However, Moongtui et al (2000), despite highlighting the effectiveness of peer feedback in improving compliance with hand hygiene and glove use, did not report any long-term improvements in practice. On a similar theme, it has been identified that institutions which use ‘huddles’ (an organisational tool which is reported to improve teamwork and communication) had a higher rate of hand hygiene compliance (Dunn-Navarra et al 2011). The practices of peers have also been highlighted as a factor which improves compliance with hand hygiene (Lankford et al 2003). In terms of more formal process feedback, this has not been found to significantly improve compliance with hand hygiene (Berhe et al 2006).
Leadership and management support for infection prevention and control is an important factor in improving practice (Linam et al 2011). However, in this study leadership was considered alongside other interventions and it is therefore not possible to identify the specific contribution that leadership input makes to practice, again supporting the need for concurrent multiple interventions. Larson et al (2000), in support of this, found that hand hygiene practices were significantly improved by a multi-faceted intervention to address organisational culture which also addresses one of the factors earlier identified in the implementation literature.

When more personal factors are considered, a link has been found between profession and compliance. It has already been mentioned that nurses adhered more in one study but this appears to be the case across the majority of the infection prevention and control literature. For example, in one surgical study nurses were found to comply more than anaesthesiologists (Tantari & Mamo 2011). There has also been found to be an increased risk of sharps injuries in surgeons when compared to nurses and in the same study a lower rate of compliance with the use of protective clothing such as eye protection in surgeons (Cutter & Jordan 2012). In the paediatric and neonatal setting, again it has been demonstrated that there is a significantly higher rate of compliance with hand hygiene in nurses when compared with physicians (Schathauer et al 2011).

It is clear from the evidence presented that there are many reasons for non-compliance with infection prevention and control precautions referred to in the literature. These factors significantly contribute to poor compliance internationally but there can be problems related to implementation of interventions which need to be addressed when designing a programme which aims to improve practice. There are also some discrepancies in the literature in terms of what is effective, though it seems likely that a multi-modal approach is the way forward.

1.2 Infection Prevention and Control Education in Health Care

Education is stressed internationally as an important aspect of infection prevention and control programmes. The Health and Social Care Act 2008 (Department of Health 2009)
states that education should be provided to all staff undertaking infection prevention and control precautions. The Welsh Assembly Government’s (2007) strategy places emphasis on the need for healthcare workers to receive education to develop their knowledge and awareness. In Australia, education and training are highlighted as an aspect of organisational support which should be provided for clinical staff (Australian Government 2010). Despite this emphasis on education, there is little detail provided regarding what this education should entail. Each individual organisation within healthcare therefore decides what should be included in their educational interventions which can mean a lack of consistency in approach and detail.

Education in infection prevention and control has developed in the UK as an emphasis has been placed on infection prevention and control in healthcare. The Department of Health (DH) has been a leader in this in terms of publications and guidance advocating education. In 1998, for example, the Department of Health recommended that the education of healthcare workers was needed to improve awareness of antimicrobial resistance (DH 1998). In *Getting Ahead of the Curve* (DH 2002), it was identified that stronger professional education and training programmes were needed to combat infectious diseases in the UK. Specific to healthcare associated infection, *Winning Ways* (DH 2003) recommended that infection prevention and control education be included in the induction of all healthcare staff and that it should be considered as part of personal development plans for all staff. In *Going Further Faster* (DH 2006), education was recommended as an action to reduce the incidence of MRSA as part of the implementation of the Saving Lives initiative. When this document was reviewed in 2008, education was again highlighted in terms of having the right trained staff with appropriate skills and behaviours to reduce the incidence of healthcare associated infection and improve cleanliness. Finally, in *Board to Ward*, the Department of Health (2008) specified that staff competence in infection prevention and control was critical to sustained improvement in both practice and reductions in infection. It is clear, then, that in the UK the Department of Health has consistently emphasised the need for the appropriate education of healthcare staff in order to improve practice. While the focus of the education has been a little more specific than the international guidance above, however, there is still a lack of detail about what the education recommended should involve. This is left to the discretion of individual organisations.
1.3 The education of nursing and midwifery students in infection prevention and control

Infection prevention and control is one of the five essential skills clusters for nursing set down by the Nursing and Midwifery Council (2010). These are a set of skills with individual criteria which must be met at different stages of the pre-registration nursing programme. While the same is not the case for midwifery, the clusters within the profession do contain elements of infection prevention. There are therefore set criteria relevant to infection prevention and control which need to be met by students and in order for this to be achieved, universities and clinical placements need to ensure that their education is appropriately focused.

There is a limited body of research which considers infection prevention and control education for nursing and midwifery students. A literature review undertaken in 2010 (Paper 1) did not identify any papers regarding infection prevention and control education for midwifery students which was considered a cause for concern. Since then, I have identified two papers, both authored by myself and included in this thesis, relevant to midwifery students. Several studies have considered the knowledge base of nursing students.

Tavolacci et al (2008) undertook a cross-sectional study with healthcare students, including nurses, and reported that nursing students had better levels of knowledge, particularly about standard precautions, than other students such as medical students. The main source of knowledge for all students was stated to be what was taught as part of the pre-registration curriculum at university. In a later study, the same conclusion was reached in that, compared with medical students, nursing students had better levels of infection prevention knowledge (D’Alessandro et al 2014). In fact, nursing students met the minimum acceptable knowledge score whereas medical students did not. Considering again the main source of knowledge, further research confirms that most nursing students use their university knowledge as the main basis for practice (Hinkin and Cutter 2014).

When more specific knowledge is tested, it has been highlighted that nursing students have a deficit concerning the infection prevention and control management of patients with Meticillin resistant *Staphylococcus aureus* (MRSA) (Jennings-Sanders and Jury
2010). It is therefore recommended that the management of MRSA is covered as part of the pre-registration nursing curriculum. While nursing students may have better levels of knowledge than other students, low levels of knowledge of standard precautions have also been reported (Wu et al. 2009a) and it has been recommended that a comprehensive foundation course in infection prevention and control should be delivered prior to exposure to clinical practice. Kelcokova et al. (2011) also identified low levels of knowledge regarding hand hygiene. They additionally found that reported compliance was poor. This is supported in Jordanian research where nursing students who completed a cross-sectional survey were found to have poor levels of knowledge and moderate levels of compliance with infection prevention and control precautions (Darawad & Al-Hussami 2013). Also considering practice, Celik and Kicash (2008) found that nursing students in Turkey complied with hand washing 80.2% of the time. However, as with other studies this was self-reported compliance via questionnaire and the results therefore have to be considered in light of this.

Wu et al (2009b), utilising a quasi-experimental design, identified that education had a statistically significant (p<0.001) impact on knowledge in nursing students. When considering other interventions, Waltman et al. (2011) discovered that the participation of students in hand hygiene monitoring positively influenced compliance. This was, however, self report information of compliance from the students themselves and it is well documented that reported practice in infection prevention and control is not as optimal as that which is observed (Nichols and Badger 2008).

1.4 Conclusion

In summary, healthcare associated infection is an international problem. Many interventions have been highlighted to improve compliance with infection prevention and control precautions, which can be poor, but implementation of research into practice can be a problem. One of the interventions identified and promoted both in the UK and worldwide is the education of healthcare staff. There is a small body of research which considers the knowledge base of nursing students and the support of education to improve this but no research had been published considering midwifery students in the same way prior to the work being undertaken which is discussed in this thesis. The
research and papers discussed in this thesis therefore aim to address deficits in the literature in terms of the infection prevention and control education of both nursing and midwifery students in both theory and practice.
Chapter 2 Methodology

2.1 Aim of the studies
The overall aim of the research was to explore and analyse the experiences and learning needs of nursing and midwifery students in relation to infection prevention and control in their clinical placements.

2.2 Objectives of the studies
It was anticipated that the overall aim would be met through the following objectives:

- To investigate the experiences of students in clinical placements
- To explore the learning needs of students according to students and mentors
- To analyse the barriers and motivators to learning infection prevention and control in clinical placements
- To understand the relationship between the attitudes towards infection prevention and control and the infection prevention and control nurse in clinical placements and how these affect learning.

2.3 The paradigm which underpinned the studies

A paradigm provides a conceptual framework for viewing and interpreting the world; it is therefore a vital component of all stages of the research process (Babbie 2010). A paradigm has been defined as

‘the net that contains the researcher’s epistemological, ontological and methodological premises’

( Guba (1990) cited in Denzin & Lincoln 2008: 26)

Paradigms impact on our perceptions, an important consideration during research as beliefs and perceptions can affect research design, data collection and data analysis. The specific area of infection prevention and control to be researched, the aim and objectives and the epistemological stance of the researcher all influence paradigmatic preferences. Given the lack of research in the subject area and the aim of exploring and analysing, an interpretivist stance was chosen. This paradigm is associated with qualitative research which was the approach taken within the research and is a position which relies heavily on methods such as interviewing, promoting dialogue between
researcher and participant in order to construct reality and generate meanings from the research process. However, all interpretations are located in a particular context or situation and time and they are therefore open to reinterpretation through conversation, in this case through interviewing students who undertake education within both educational and clinical contexts (Cohen and Crabtree 2008). The emphasis is on discovering meaning and understanding within this particular context (Blaikie 2007) and the methodological approach and method chosen therefore had to consider the effect that the context had on responses gained from participants.

Within research, the beliefs that a researcher holds will reflect on the way the research is designed and how data are both collected and analysed (Williams 1998). The researcher’s values are therefore inherent in all phases of the research process (Cohen and Crabtree 2008). The researcher cannot be separated from that which is being researched as the researcher has an effect on data collection and analysis which are considered to be biases that must be acknowledged (Bryman 2012). In the research under discussion, the position of researcher as both an infection prevention specialist and as a lecturer brought with it specific biases based on previous experience in clinical practice and the expressed views of students about infection prevention in lectures undertaken in the past. There was therefore the need to closely monitor the research process through an audit trail, the maintenance of a reflexive diary and the keeping of field notes, all discussed later. Despite the possible biases that may be inherent in interpretivism, this paradigm positively values the researcher’s subjective involvement, though some criticise this subjectivity (Blaikie 2007). Interpretivist research can be described as having an exploratory and descriptive purpose which is designed to discover what can be learned about the area of interest, in this case IPC education of pre-registration nurses and midwives, an under-researched group in this area of clinical practice (Williams 1998).

Interpretivism refers to a group of approaches that share particular ontological and epistemological assumptions (Blaikie 2009). It has its roots in the German intellectual tradition of hermeneutics. The interpretivist paradigm is said to have developed as a critique of positivism in the social sciences (Cohen and Crabtree 2008). In general, interpretivists share the beliefs of relativist ontology (the assumption that reality is created inter-subjectively) and transactional or subjectivist epistemology (the assumption that we cannot separate ourselves from what we know). Epistemological
assumptions include that reality is created through social interaction; the concept that
meaning and language are constructed within a certain context and time as previously
alluded to; and that there is no one universal truth of reality (Buchanan 1998).

Interpretivist research has a clearly considered aim, clearly articulated interpretation of
data collection and analysis and provides written data which provide persuasive
arguments (Angen 2000); all aspects strived for within the body of work which
comprises this thesis. Interpretivism contrasts with positivism which believes that an
external observer can have true objectivity. While epistemology or the nature and
construction of knowledge have these two opposing views, interpretivists highlight that
the person who knows and what is known are interdependent and the data are therefore
subjective. In the research under discussion, the previous biases highlighted may argue
against true subjectivity as the researcher can have a clear impact on the data collection
and analysis processes through previous knowledge and experience and expectations in
advance of the research about what will be discovered. There is also the belief in
interpretivism that reality can be complex and consist of multiple layers (Cohen et al
2000). The concern is to probe various unexplored aspects of a topic, such as in this
case infection prevention and control education in pre-registration education, as
opposed to trying to establish relationships between different variables as in positivism
(Dash 1993). Interpretivism, then, essentially emphasises the understanding and
interpretation of phenomena using qualitative means. There is also the element of
exploring first and then developing theory which allows deeper explanations and
insights, addressed within this research by the formation of a conceptual framework
which underpins the thesis in Chapter 4.

The group of approaches considered within interpretivism includes phenomenology,
ethnography and grounded theory. Phenomenology tends to pursue subjective meanings
and individual sense attributions so is concerned with investigating the lived
experiences of individuals (Bryman 2012). Ethnography aims to build a body of
knowledge of cultural descriptions and theory and is therefore a systematic description,
analysis and interpretation of cultures or subcultures (Scott-Jones and Watt 2010).
Grounded theory involves a process of discovering theory from data that have been
systematically collected and analysed (Glaser and Strauss 2009). The research under
discussion did not aim to investigate lived experiences or cultures or to discover theory
but to analyse and explore experiences of infection prevention and control and does not
therefore clearly fit within any of the three approaches. Though a conceptual framework is used and discussed in Chapter 4 which demonstrates the advancement of nursing knowledge, this is not strictly theory development which greater supports the decision to reject grounded theory as an approach. However, Paley and Lilford (2009) argue that it is not necessary to align qualitative research to a particular philosophy and that instead it should be seen as a tool used to answer a question. Therefore although an interpretivist paradigm has been used within this thesis, there are different aspects to each of the group of approaches within it evident within the methodology of the research presented.

Angen (2000) has commented on the ethical and substantive validity of interpretivism. He believes that evidence of the interpretive choices made during the research process is required, which I believe is partly addressed by the method of data analysis used in these studies (Paper 8). We also have to self reflect to understand our own transformation and the use of field notes and a reflexive diary during the studies clearly adhere to these interpretivist requirements which addresses subjective validity. Researchers need to ask themselves if their research is helpful to the target population and if we have really learned something from our work in order to demonstrate ethical validity (Angen 2000) and it is hoped that these aspects are reflected in this thesis to emphasise and strengthen the use of the interpretivist paradigm and highlight the importance of the topic area for future nursing and midwifery education in infection prevention and control in both theory and practice.

2.4 Data collection method
Infection prevention and control education can and have been investigated using quantitative approaches (Coopersmith et al 2002), as have staff and student experiences of this education (Bush et al 2005, Bryce et al 2008). However, results from such studies can be limited as they do not fully capture the real phenomenon of the impact that education and practice can have on student learning. Qualitative approaches are therefore more appropriate if an in-depth understanding of the real experiences of education is required, in this case to analyse and explore real experiences of infection prevention and control in clinical placements. Such approaches have been utilised in infection prevention research to explore issues such as perceptions of hand hygiene (Yuan et al 2009) and differences between observed and self-assessed levels of practice.
Qualitative research promotes the use of several different data collection methods including interviews, focus groups and observation, approaches which are effective at investigating experiences, beliefs and opinions. The aim of exploring and analysing experiences needed to be considered when deciding what method to use for the research. Observational methods give the researcher first hand experience with participants and information can be recorded as it occurs (Creswell 2009). Unstructured observations are a means of comprehending the actions and interactions of individuals without predetermined ideas (Bryman 2012). However, it was decided that this was not an appropriate method to gain an insight into experiences of infection prevention and control in clinical placements.

Focus groups involve a group of people being asked about their perceptions of, attitudes towards, beliefs about and opinions of a particular subject and are undertaken in an interactive setting. They were considered as additional material can be triggered by the views of others in the group (Finch and Lewis 2003). This can enable a greater depth of data (Bloor et al 2001). When using focus groups, the researcher creates a permissive environment which encourages participants to share their points of view with others (Krueger and Casey 2000). However, not all participants will feel comfortable speaking in a group setting, with some becoming reticent about being candid with a group of strangers (Hatch 2002). This approach was rejected, however, as the overall aim of the studies was to gain individual experiences in order to explore and analyse them. It was considered that in a group setting in-depth personal experiences may not have been elicited.

Qualitative interviewing is a common interpretivist approach. Conversing with people as occurs during interviewing enables them to share their experiences (King and Horrocks 2010). However, it needs to be acknowledged that people attach different interpretations to similar events. This means that we cannot adopt a simplistic attitude to interpretivism. The interviewee generally has a complex stock of knowledge about the subject being studied and in the research under discussion could therefore contribute to the body of knowledge about experiences of infection prevention and control. This knowledge includes assumptions that are immediate and explicit and which can be
expressed spontaneously on questioning (Babbie 2010). Implicit assumptions complement these and in order to articulate them the interviewee needs to be supported by methodological considerations. This is the reason for the application of different types of question, both open and closed, in interviewing (Silverman 2008).

Interviews can be unstructured, structured or semi-structured. Structured interviews are commonly viewed as a quantitative approach as they are standardised and yield data that can be statistically analysed (Kvale and Brinkman 2008). When used as a qualitative method they are most often used in focus groups in order to compare responses (Londlof and Taylor 2002). This type of interview was not considered appropriate for exploring experiences.

Unstructured or in-depth interviews are one of the most commonly used methods in qualitative research. Such interviews are described as a type of conversation (Lofland and Lofland 1995). However, in reality good in-depth interviews appear naturalistic so bear no resemblance to an everyday conversation (Legard et al 2003). The unstructured interview is also conducted in conjunction with the collection of observational data (DiCicco-Bloom and Crabtree 2006). Because there were several objectives to the study, it was considered that unstructured interviews would not be appropriate and would not provide the focused approach required.

Semi-structured interviews involve key questions with probing for further information (Patton 2002). They are often the sole data source for qualitative research studies (Adams et al 2002). They are organised around a set of predetermined open questions where other questions emerge from the dialogue that occurs between interviewer and interviewee (DiCicco-Bloom and Crabtree 2006). Semi-structured interviews are considered to be a combination of the flexibility of unstructured interviews and the directionality of surveys with the result being focused qualitative data (Schensul et al 1999). This approach was considered appropriate to meet the aim and objectives of the research. The interviews were also focused. One of the goals of focused interviews is to maximise the scope of the topic, giving interviewees the opportunity to identify points of view that have not been anticipated (Flick et al 2004). Semi-structured interviews were therefore undertaken with nursing and midwifery students and nurse mentors using interview guides (Appendices I and II). Interviews were audio-recorded. This enabled concentration on the focus of the interview with attention being on the
interviewee. It also provided a verbatim record of the whole interview (Blaxter et al 2001).

2.5 Clinical and educational context
The research was undertaken in one city in the North West of England. Participants were recruited from one School of Nursing, Midwifery and Social Work in one university and from one large NHS Trust in the same city. The university, at the time of the research, offered two pre-registration nursing courses, one a degree and one a diploma; and one pre-registration degree programme in midwifery. Each year there was one intake of students to each programme, termed a cohort. The NHS Trust was used for practice placements for the students and consists of four hospitals across a range of specialities including maternity and children’s services and a specialist eye hospital. Nursing and midwifery students spend 50% of their pre-registration programmes in practice placements in the UK, with the remaining time spent in the university setting. In each placement, students are allocated a mentor who is a registered practitioner who has undertaken a Nursing and Midwifery Council (NMC) approved course to prepare them to be a mentor who teaches and assesses students in practice. Within the UK, all mentors are registered within their NHS trust on what is known as the live register of mentors, a register which is maintained to identify all qualified mentors within an organisation.

2.6 Sampling and recruitment
Qualitative research aims to achieve different types of generalisability or transferability from quantitative research (King and Horrocks 2010). It therefore does not follow the usual probability sampling approaches. There are several types of non-probability sampling including convenience, quota and purposive (Denzin and Lincoln 2008). Convenience sampling involves drawing the sample from participants who are readily available (Weatherington et al 2010) and is the most common type of non-probability sampling used in qualitative research. Unfortunately, members of a convenience sample may have limited material to impart which addresses the research question or aim (Black 2002). Elements of this approach were utilised in the research under discussion as it can be used in combination with other sampling methods. The sample was convenient in nature in that the students and mentors approached were those in the
university where I worked and in a local NHS Trust used by the university for clinical placements. They were therefore located conveniently for use as participants.

Quota sampling involves a matrix that describes the characteristics of the target population (Rubin and Babble 2010). It often depends on availability to determine which elements will be included in the sampling (Monette et al 2011). As it was not the aim to find participants who met a specific quota such as age or gender, this approach was also rejected.

Purposive sampling is based on the selection of individuals as samples according to the aims and objectives of the research (Calmorin and Calmorin 2007). The primary goal is not to generate a representative sample but to represent certain characteristics that are considered relevant to the study (Yates 2003). There are the same limitations as with other non-random sampling approaches in that the ability to generalise is severely limited (Johnson and Christensen 2010). However, as it targets specific elements it is often more appropriate for specific studies than other non-probability methods (Daniel 2011). This type of sampling is considered the most robust in qualitative research studies and was therefore the approach taken, in combination with elements of convenience sampling.

2.6.1 Sampling and recruitment of the mentors
Mentors were approached who were on the Trust live register of mentors and who had mentored at least one student within the previous 12 months so that they were able to comment on student learning needs. They were also recruited from different areas within the organisation to provide a range of specialities such as medicine, surgery, paediatrics and critical care and so there was an element of stratified sampling involved. Stratified sampling allows greater control over the sample’s composition which assures the researcher of more representativeness of the stratification variables (Reis and Judd 2000). In this case, the sampling strategy was non-random but aimed to ensure that different working areas were represented. Sampled mentors were contacted by letter and invited to participate. Those who volunteered were interviewed.

2.6.2 Sampling and recruitment of the students
Students were recruited via e mail. Students in years 2 and 3 of both the diploma and degree programmes were approached as it was considered that these students would
have experienced enough practice placements to be able to comment on infection prevention and control practices. Emails were sent to cohort groups (a group of students who commenced their programme at the same time) rather than to individual students and those who wished to participate were invited to contact the researcher. At this stage the participant information sheet was provided. Students were advised that they could withdraw from the study at any point including during data analysis.

Participants were interviewed until data saturation was reached. Data saturation involves using new participants continually in the study until the data set is complete, as indicated by data replication or redundancy (Bowen 2008). The researcher therefore finds that no new codes, categories or themes are emerging from the analysis of the data (Rebar et al 2011). A total of 31 nursing students, 15 midwifery students and 32 mentors were interviewed.

2.7 Data Analysis

2.7.1 Transcription

There are arguments for interview transcription to be undertaken by the interviewer themselves. It has been suggested that this brings the researcher closer to the data and beginning the analysis process by identifying themes. Transcription can also enable the researcher to become more aware of similarities and differences between the accounts of different participants (Bryman 2012). However, this can also be time consuming and arduous. Because of this, the decision was taken to send the recordings to an external transcriber. The next decision to make was whether to transcribe verbatim including pauses, laughter and so on. In some instances, verbatim transcription is not considered necessary such as in organisational case or evaluation studies where broad patterns of themes are considered or where certain interviewees are seen as key informants. However, in this research the aim was to explore and consider experiences in depth and it was thought that each participant would have a valid contribution to make. Full transcription was therefore the approach taken.

2.7.2 Analysis

It is important here to discuss the data analysis approach used during the research as despite mention of this within the papers, the approach used links philosophically to the paradigm supporting the research. In qualitative research, the method of data analysis used often reflects the paradigm used. Some paradigms have specific methods for
analysis (such as in phenomenology) or analysis can be a more iterative process (as in grounded theory). Reflecting the use of interpretivism, several data analysis approaches were considered prior to a final decision of the method to be adopted. Approaches to interview transcript analysis tend to be divided into content or thematic analysis.

Content analysis aims to quantify the content of documents such as interview transcripts in a systematic and replicable manner. It is considered to be a very transparent and objective approach and is referred to by some as an unobtrusive method in that it does not require study participants to take the researcher into consideration (Bryman 2012). However, considering the paradigm used within this research which considers the role of the researcher and acknowledges the impact that the researcher may have on the data analysis process, this was not considered an appropriate method. The aim of exploring and analysing could also not be met using content analysis as the richness of the data needed to be clear and qualitative, rather than attempting to quantify experience.

Thematic analysis was therefore considered to be the appropriate approach to take. While being one of the most common approaches in qualitative data analysis, and an often quoted method used in research papers, it is not considered to be an identifiable approach on its own. It was therefore important in the search for an appropriate analysis technique that thematic analysis was not the end point but a starting point to explore the approaches considered to be thematic in nature. King and Horrocks (2010) identify three basic principles that apply to thematic analysis, whatever the approach taken; balancing within case and cross case analysis, organising themes, balancing clarity and inclusivity and auditability. These principles therefore needed to be applicable to the method chosen for analysis of the research under discussion.

Langdridge (2004) proposes a three stage process of descriptive coding, interpretive coding and overarching themes. This process was initially considered but it was not seen to have a clear audit trail within it which was thought to be important in reflecting interpretivism and in improving rigour in the analysis of data. Burnard’s (1991) approach to interview analysis was also considered, primarily as it has been used before in a previous qualitative study and had seemed systematic and easy to understand and follow. It consists of 14 stages and combines grounded theory and other work on qualitative data analysis. It is aimed at data produced by semi-structured interview, as in this case, with the aim being to link themes and interviews together under an
exhaustive category system – it therefore assumes that one respondent’s views can be linked with another’s. However, looking at it several years after its previous use, with a more academic eye, there was again no evidence of how an audit trail could be produced, and transparency was not easy to demonstrate.

Framework Analysis is an interpretative approach which borrows principles from different epistemological traditions. It considers that the world exists independently of individual subjective understanding but, in keeping with interpretivism, is only accessible in qualitative research via participants’ interpretations which are then further interpreted by the researcher (Ritchie et al 2003). It also acknowledges the active role that the researcher plays in identifying themes and selecting which are of interest (Taylor and Ussher 2001). While Framework Analysis borrows epistemological traditions, it is argued by Braun and Clarke (2006) that it is independent of theory and can therefore be applied across a range of theoretical approaches, including interpretivism. Rigour and order in qualitative data analysis are of importance as the world is not systematic so analysis has to be so. Framework Analysis is a form of analysis which promotes a structured, rigorous and transparent approach which has an audit trail, factors which address some of the criticisms of qualitative data analysis and in particular thematic analysis (Braun & Clarke 2006). It was therefore the approach taken in this research. Paper 8 focuses on the use of framework analysis in nursing research and uses a worked example from the research presented here to demonstrate its use.

In terms of the practical aspects of data analysis within this research, all transcripts from interviews with students and mentors were analysed by myself and a sample were also independently analysed by three other researchers who had not been involved in data collection. This was the approach taken in order to improve rigour in data analysis. Appendix III shows the stages followed with examples from the research as reflected in Paper 8.

2.8 Ethical Issues
Several ethical issues had the potential to arise and therefore needed to be considered in advance of the three studies. Some ethical issues in qualitative research are different from those in quantitative research and can be subtle (Orb et al 2001). It is however acknowledged that where there is a failure to address ethical issues, the result can be
researchers who are not prepared to cope with what can be an unpredictable data collection approach (Batchelor and Briggs 1994). Ramos (1989) refers to three types of issues which can affect qualitative research; the relationship between the researcher and participant, the subjective interpretations of data by the researcher and the design of the research.

Ethical approval was sought and gained from both the University (for the interviewing of students) and the NHS (for the interviewing of mentors) research ethics committees. Research governance approval was also gained from the NHS Trust from which mentors were drawn.

One of the ethical issues which arose during the research studies, in particular with the nursing and midwifery students, was that of role conflict due to a prior relationship with some students. Nurse researchers can often find that the roles of researcher and clinician can conflict (Orb et al 2001) but in this case it was the roles of researcher and educationalist which conflicted. Interviews need to be viewed as an interactional event where the interviewer and interviewee jointly construct meaning (Garton and Copland 2010). The interviewer should present themselves as both neutral and encouraging (Rapley 2001) but this neutrality can be a cause for concern where there is a prior relationship. Many of the students who participated in the study had been taught by myself about infection prevention and control. It was considered that, due to this prior relationship, participants would view me as a lecturer as opposed to a researcher and that this might affect the interaction during the interview. This was the case during some interviews where some participants asked questions about infection control. In order to minimise this, interviewees were instructed prior to the interviews to ignore the previous role of the interviewer and view me as a researcher. Any questions that arose that were not pertinent to the interview were then answered after the interview.

Another role conflict issue arose where students and mentors identified poor practices that they had either observed or participated in. Role conflict can occur when participants wish to disclose an off the record remark. While this can establish that an important bond has been made with the participant, it is important for the researcher to remind the participant that there is a purpose to the study and that all communication is meant to be part of the study. Elements of the studies meant that students were asked specifically about poor practices that they had observed. It was therefore evident prior
to the research that often dangerous practices would be commented on. Interviewees were promised confidentiality prior to the interview. A guarantee of confidentiality which precedes such communication means that the information relayed is only being passed on in what is an explicit cloak of silence (Bryman 2012). Participants therefore expect their dialogue to be confidential and impart it on this basis. In order to address this issue, participants were asked if they wished to take any disclosure further in terms of official action.

As someone in a position of power in terms of the lecturer-student relationship, I was also aware of the potential for coercion in that potential participants may have felt obliged to take part in the research. This issue was addressed through both the recruitment process in terms of emails to cohorts instead of individual students and the consent process where participants were advised that they had the right to withdraw from the study at any time. Students were not contacted again if they did not volunteer to participate to avoid undue pressure being placed on students to be a part of the study.

Informed consent makes assumptions about truthfulness, confidentiality and openness on the part of the researcher (Savin-Baden and Howell Major 2010). It is a concept which attempts to convey what is seen to be an appropriate relationship between researcher and participant (Miller and Boulton 2007). Obtaining consent is based on the principles of autonomy and justice (Francis and Armstrong 2007). It requires that prospective participants have been provided with project information that is sufficiently comprehensive to allow a decision about participation (Fischman 2000). Participants in the research were provided with both written and verbal information about the study and signed written consent forms. Consent was reviewed at all stages, including data analysis when transcripts were returned to interviewees to identify if there was any text that they wished to remove.

Confidentiality is a central issue in all research approaches. It can be challenging in qualitative research to maintain confidentiality while attempting to present rich and detailed accounts (Kaiser 2009). In interviews, participants may be sharing highly emotive or personal information and interviewees therefore need to be informed in advance of the level of confidentiality provided (Klenke 2008). In interviewing, there is a need to justify findings on publication and this involves the use of direct quotes from interviewees which in some respects leads to breaches of confidentiality (King and
Horrocks 2010). It is therefore suggested that anonymity be promised instead. Though confidentiality and anonymity are often considered to mean the same thing, this is not the case. In interviewing we can promise that the participant’s details will remain confidential but this then relates to anonymity where there is a promise that the quotes used will be anonymised. Anonymity was maintained throughout the analysis and publication processes by the labelling of transcripts and quotes with a participant number.

2.9 Rigour

There is some disagreement in the literature about the approach which should be taken to ensure rigour in qualitative research. Rolfe (2004), for example, states that some advocate the use of concepts and terminology used in the positivist stance so that reliability and validity are achieved when a number of verification strategies are used during the research. However, it is argued that issues within qualitative research are different to those in quantitative approaches and therefore different terminology is needed (Koch and Harrington 1998). Sandelowski (1993) refers to the concept of trustworthiness in qualitative research and uses terms such as credibility, dependability, transferability and confirmability based on Lincoln and Guba’s (1985) earlier work.

Credibility is said to correspond to internal validity. It refers to whether the participants’ views of the events match up with the researcher’s portrayal of them in the research report (Lodico et al 2010). Ary et al (2010) provide five categories of evidence for enhancing credibility; structural corroboration, consensus, interpretive adequacy, theoretical adequacy and control of bias. Structural corroboration refers to triangulation or the use of multiple types of data to support or refute interpretation. As the studies involve only one method of data collection, structural corroboration could not be considered. However, as this is the case in many research studies where one data collection method is utilised this was not considered to be an issue which had significant impact on the credibility of the research. Consensus relates to the opinions of others and was checked and achieved in the reported research through the use of member checking and the involvement of other researchers in data analysis. Interpretive adequacy refers to representation and how well any claim is supported by evidence. It considers the extent to which data interpretations represent an understanding of the perspective of the research participants and the meaning attached to their dialogue. This is addressed through the use of quotes from participants to support conclusions drawn
from the studies throughout the papers presented and through the use of other researchers in the data analysis process. Theoretical adequacy requires the use of a conceptual model or framework to underpin the research (Fawcett and Downs 1992). It represents the degree to which a theoretical explanation fits the data and is thus defensible. This is addressed in chapter 4 through the use of a combination of King’s conceptual framework and the theory of planned behaviour, referred to in Papers 2 and 6.

The control of bias is important in any research approach as it needs to be ensured that preconceived ideas do not affect either the collection or analysis of data. This could have easily been the case as the researcher has both clinical and academic experience in infection prevention and control and there may therefore have been preconceived ideas about what participants might say during interviews. This was addressed through the use of audio recording and the production of field notes after each interview. Comprehensive field notes enable the researcher to revisit the context at a later date. Completing field notes immediately after each interview also improves accuracy and ensures a more comprehensive depth of description (Tracy 2013). These field notes were referred to during data analysis so that the context was clear when analysing meaning in statements.

Dependability relates to clear and appropriate research processes (King and Horrocks 2012) and is aligned to reliability in quantitative research. It considers the consistency and trustworthiness of the research process. Lincoln and Guba (1985) suggest that researchers should adopt an auditing approach to establishing dependability. Framework analysis ensures that there is an audit trail for data analysis, making the process transparent, and the use of other researchers in the analysis process further addressed dependability (Bryman 2012). Dependability involves the accommodation of changes in the field studies and in the design of the research. The researcher’s understanding becomes more refined during data collection and analysis. Though research questions may be constructed at the outset, these tend to evolve as a response to data which emerges, allowing the researcher to reshape or eliminate initial questions and pose others (Conrad and Serlin 2006). This was the case in the research under discussion as, initially, questions regarding attitudes towards infection prevention and control and the infection prevention and control nurse were not posed. These issues
emerged from the data and were therefore added to the interview schedules during the research.

*Transferability* is equivalent to external validity in quantitative research and reflects the probability that the findings of a study have meaning to those in a similar situation (Bryman 2012). The setting for the studies therefore needs to be described in enough detail for the readers to judge this. Comments about transferability are made within the papers. It is acknowledged that the studies were undertaken in one university and NHS Trust in the North of England and the views expressed therefore do not reflect those of mentors and students in other areas of the country. It is, however, the case that the findings of the studies may act as a catalyst for consideration of the issues identified in other universities and NHS Trusts which educate nursing and midwifery students.

*Confirmability* concerns the consistency, objectivity and repeatability of the decision making process when collecting and analysing data (Macnee and McCabe 2008) and relates to inter-rater reliability. This is another criterion which can be addressed through the use of an audit trail. There also needs to be enough detail in research reports to enable others to repeat the study. The identification of the interview schedule used within the papers assists with this process as does the paper on the application of framework analysis. Confirmability is further enhanced through the involvement of other researchers in the data analysis process – this ensured that decisions taken were confirmed with others (Bryman 2012).

Although Lincoln and Guba’s (1985) criteria have been used to establish rigour, it needs to be acknowledged that there have been criticisms of this approach. Some have argued against specific criteria while the process has also been questioned as ‘inimical to philosophical positions that argue for the existence of multiple social worlds’ (King and Horrocks 2010; 161).

It is well established within qualitative research that reflexivity is an important theoretical concept. Reflexivity is considered to not only be a critical reflection of where the researcher is placed in the inquiry but also on the process involved in the generation of knowledge and the factors influencing it (Guillemin and Gillam 2004). Finlay (2002) describes five types of reflexivity. Introspection involves exploring your own experiences and meanings to interpretations and meanings within the research. The
completion of field notes following each interview forms part of this process as it enables reflection on thoughts and preliminary interpretations from each interview. Intersubjective reflection involves consideration of the relationship between researcher and participant. This was considered as part of the ethics process in terms of coercion and role conflict. Mutual collaboration involves considering the role of the participant within the research and how their reflections will affect the research process. The audio-recording of each interview and verbatim transcribing goes some way to addressing this concept. Social critique links to the power relationship between researcher and participant, also addressed during ethical considerations. Finally, discursive deconstruction is the acknowledgement that there are different meanings within the data which may not always be acknowledged by the researcher. The use of other researchers within data analysis partly addresses deconstruction as others can find their own meanings within the data. Willig (2008) acknowledges that the researcher can influence and shape the research process both personally (personal reflexivity) and as a theorist (epistemological reflexivity). Reflexivity encourages us as researchers to consider our role within the research process and how this affects both data collection and analysis. It is achieved when researchers are aware of themselves in relation to the participants, data and their own role within the study (Munhall 2007). One way of achieving reflexivity is through the use of a reflexive diary or journal. This acts as a continual source of introspection (Creswell 2009).

Etherington (2004) suggests asking several questions as part of reflexivity including questioning the personal history which led to an interest in the topic under study; any presuppositions about knowledge of the topic; the researcher’s position in relation to this knowledge and influences on positioning in relation to the topic and study participants. These issues were therefore considered when keeping the reflexive diary during data collection and analysis. Experience as an Infection Prevention and Control Nurse and as a Lecturer in Infection Prevention and Control meant that there was a specific interest in the topic area and that there were clear preconceptions about the area under study. This was also contributed to by comments made by nursing students during lectures about what they had observed in practice. It therefore needed to be acknowledged initially that there was a view that many negative experiences would be discussed during the interviews. Using a reflexive diary ensured that there was less bias in the questioning during interviews and that views about good practices were also elicited. This is demonstrated in the research by comments in the diary about the need to
steer participants towards a positive standpoint when they had focused only on inappropriate infection prevention and control practices, despite being asked to also comment on good practice. This acted as a reminder to continue to do this with future interviewees to ensure both a balanced interview and balanced views from participants, reducing bias in the focus of the discussion. Creswell (2009) highlights that researchers should reflexively identify issues such as their biases, values and personal background. Statements which provide background data which enables the audience to better understand the topic including the researcher’s interpretation of the phenomenon are also required. The reflexive diary was a valuable tool in ensuring that reflexivity was addressed and that influences on data collection and analysis were acknowledged.
Chapter 3 A précis of the published papers

This chapter presents a précis of the eight papers which have been published as a result of the research discussed in chapter two and on which this thesis is based.


Paper 1 is a review of the literature which was undertaken prior to the research commencing. It includes an overview of the national and international research on education in infection prevention and control. The paper aimed to: analyse the role of education, both in changing practice and reducing rates of infection; consider which teaching approaches were most effective in improving relevant knowledge; analyse the literature about infection prevention and control education for nursing and midwifery students.

Education is a vital aspect of any infection prevention and control programme and this fact has been stressed in both the national and international literature. Prior to my undertaking a review, policy documents advocating professional education about infection prevention and control had been published in England (Department of Health 2009), Wales (Welsh Assembly Government 2004), Australia (Australian Government 2004) and the United States (DHSPS 2006). Since Paper 1 was published, further policies have stressed the importance of education in improving practice and reducing rates of infection (NICE 2012, HPA 2012, ECDPC 2013). A total of 39 research papers were identified by the search strategy used for Paper 1; most were undertaken in the United Kingdom and the United States.

My review highlighted the lack of conclusive evidence that education improves practice in infection prevention and control, particularly in the long-term. This is not to say that education does not improve practice but there were several issues within the research identified which led to the ‘lack of evidence’ conclusion. Many of the studies combined several interventions and it was therefore not possible to identify the specific role of education in improving practice. There was also little measurement of the long-term impact of interventions. A Cochrane systematic review of the effect of interventions to improve hand hygiene compliance included in Paper 1 also identified a lack of rigorous
evidence (Gould et al 2010). The Cochrane review also drew attention to the methodological deficiencies of the existing studies. In Paper 1, small sample sizes, randomisation issues, minimal effect sizes, and less than ideal outcome measures were identified. The weakness of this evidence base means therefore that we cannot conclude that education does not improve practice, only that there is a lack of rigorous evidence that it does.

More rigorous research is needed in this area although the research is not straightforward. Isolating education as an intervention in clinical practice without including other interventions that already take place such as audit, surveillance with feedback, the use of posters and the introduction of new products and policies may not be possible in terms of patient safety. However, more randomised controlled trials are needed in this area in an attempt to improve the evidence base to support education. There is some evidence, however, that multi-modal interventions may be effective so education alone may not be enough to improve practice but a combination of interventions may have a positive impact (Palomar et al 2013).

Only three studies were identified which examined the education of nursing students in infection prevention and control. The first compared three teaching methods through focus groups (Mikkelsen et al 2007); the second compared two teaching approaches and tested knowledge, finding that there was no difference between the two approaches (Reime et al 2008). The third study was a cross-sectional survey to measure knowledge and self-reported practice and found both to be inadequate (Wu et al 2009). None of these studies was undertaken in the UK, though this is not a flaw, just a deficit; and none of them considered education in practice placements. No papers were identified that considered the infection prevention and control education of midwifery students.

Several research deficits were identified by this review but the infection prevention and control education of nursing and midwifery students, particularly in clinical placements, was considered to be a major area where further research was needed in terms of investigating their experiences and exploring their learning needs.

Weaknesses of the review need to be acknowledged. This was a traditional, narrative overview of the literature in the area rather than a systematic review. When the review was undertaken it was intended to be broader in scope rather than aimed at answering
specific, focused questions and there was not the time or resources to undertake a systematic review. However, in hindsight had there been the resources, a systematic review might have been a more scientific approach to answering the question of whether there was evidence that nurse education in infection prevention and control improves professional behaviour and patient outcomes. Paper 1 also only reviewed English language papers and there may therefore be a body of research which was not identified by the review. The paper formed an important foundation for my programme of research; it emphasised the need for more rigorous research and suggested that caution should be used in highlighting education as a stand-alone strategy for both improving practice and reducing rates of infection.


Paper 2 reported on the experiences of nursing and midwifery students in clinical placements in terms of infection prevention and control. Students were asked about the following issues:

- What good and inappropriate practices had been observed and the basis for their judgement
- The effects of what had been observed on their own practices
- Whether they had challenged or reported poor practice
- Whether what had been taught at university was valuable in practice

This paper aimed to present an overview of the findings of the research undertaken with nursing and the initial nine midwifery students. It was initially thought that this would be the only paper to be written following the research as at this time, the study involving mentors had not been conceived. I considered it important that the views of midwifery students be presented as this was a research need identified in the literature review. However, the small sample of midwifery students meant that publishing the findings for midwifery alone was not considered prudent and they are discussed, within the paper, alongside nursing students.

Paper 2 describes how students reported regularly observing inappropriate infection prevention and control practices. Despite documents such as *Winning Ways* (DH 2003), *Going Further Faster* (DH 2006) and the three National Audit Office reports (NAO
2000, 2004, 2009) reporting improvements in infection control in NHS organisations, it seems that poor practice is still perceived by some students as usual practice in some areas. For example, one student said:

*Oh, I’ve seen so many things where they’re running around looking for a sharps bin with a needle in their hand.*

In fact, some students reported lowering their own standards to match those of their placement at the time in order to ‘fit in’ and related literature on this theme was discussed in the paper. Curtis et al (2012) also identified the need for a balance between upholding professional ideals and nurses’ realisation that they might have to adapt these ideals and ‘conform’. The findings of Curtis et al (2012) were based on a grounded theory study of 19 nurses and though related to the provision of compassionate care rather than infection prevention and control, highlighted nurses’ need to ‘fit in’, whatever the situation. A cross-national case study involving universities in Australia and the UK found that students felt a need to not ‘rock the boat’ so that they could fit in with the other staff in their clinical placements (Levett-Jones and Lathlean 2009), a finding echoed in Paper 2. Levett-Jones and Lathlean (2009) also demonstrated that students were aware of the appropriate standards as they were able to identify when they had lowered these standards. The students’ knowledge was based on what had been taught at university which reflects one of the pieces of research discussed in Chapter 1 (Tavolacci et al 2008) as well as from observing positive role models amongst experienced colleagues.

Students interviewed for Paper 2 expressed a perceived positive correlation between theory and practice and used theory to understand why specific procedures were important, that is, to provide a rationale for their actions. This was, as previously stated, combined with students’ observations of more experienced colleagues who were seen as a source of senior advice for other nurses so the views of nurses about other nurses influenced the views and practices of students. This demonstrates that students were choosing role models on the basis of whether other nurses saw them as positive role models. Walthew and Scott (2012), in a focus group study about health promotion, previously identified that if student nurses do not see specific aspects role modelled by qualified staff, they do not perform these aspects which emphasises the importance of role models in practice. Students in a previous study about caring expressed a desire to
be more like those whom they considered to be positive role models (Pederson and Sivonen 2012). This demonstrates that the identification of correct positive role models is important and the basis of this identification equally of value, particularly when students’ understanding often reflects the views and knowledge of those who teach them (MacLeod Clark and Maben 1998).

As previously mentioned, students sometimes lowered their standards of practice order to conform to observed practice in their placement areas. However, this was not always the case and most students felt that their practice had improved over the course of their programme of study, despite observing inappropriate practices at times. Many students felt encouraged to practice more positively when observing poor practice as they felt that this was the correct thing to do for their patients. There was, however, confusion amongst some students due to the constant observation of conflicting practices. One student spoke about her constantly changing philosophy depending on where her placement was and what practices she observed. This identifies that despite the use of theory and positive role models to underpin practice, there is still confusion about some practices if students are constantly exposed to differing standards.

Most students expressed a reluctance to challenge and/or report poor practice for several reasons; Concerns were expressed about the need to pass the requirements of the placement, the need for staff to be friendly with them and to fit in, respect for qualified nurses as their superiors and power relationships. Some final year students felt that they had become more confident in the possibility of reporting poor practice but others expressed negativity towards themselves for their inability to challenge and report as they felt that this conflicted with their role as patient advocate. When I submitted Paper 2 for publication, the editor of the journal that provisionally accepted it required me to situate the study within nursing theory. Consequently, I applied King’s (1981) Conceptual Framework as a lens through which to view the results. The application of King’s framework is discussed further in Chapter 4.

There are a few limitations to Paper 2 which should be highlighted. Although data saturation was reached at 40 participants, only nine of these were midwifery students. Whilst this reflects the ratio of midwifery to nursing students in the university, it means that most of the data were gathered from nursing rather than midwifery students. The majority of participants were also in the second rather than year third year of study and
may therefore not yet have been exposed to more advanced infection prevention and control skills such as risk assessment in the allocation of side rooms for isolation purposes. Despite these limitations, this paper adds to the currently small body of knowledge about the clinically based education, of nursing and midwifery students, in infection prevention and control. This research may act as a catalyst for future research, in particular in relation to student midwives. This was the first paper that I have identified which considered the infection prevention and control education of midwifery students and therefore has international implications in terms of beginning discussions about this area of education and practice. It was also the first paper identified to investigate the reasons why students do not report poor practice in infection prevention and control. Research into experiences of infection control in clinical placements is limited and tends to focus on either knowledge or compliance. This paper therefore adds a new perspective by looking at how students perceive their clinical placements and how this might affect their learning.


Paper 3 was written as I considered it important to focus specifically on the sometimes opposing views of nursing students and mentors in relation to education needs in infection prevention and control. Previous literature has focused on knowledge in practice but not on perceived educational need and what students and mentors require from educationalists in this subject area.

Paper 3 reported on the theoretical and practical infection prevention and control education needs of nursing students according to these students and their mentors. Data analysis yielded several themes:

- Deficits in the knowledge of students in practice
- Education as a barrier in practice
- Preferred / recommended methods of teaching and learning
- Comparison of information provided by the university and practice placements
- Assessment as a teaching and learning approach
- Qualities needed to be an effective teacher
There was a dichotomy between the views of mentors and students in terms of educational deficits, with mentors focusing on theoretical knowledge and students on clinical skills. This is interesting considering the students’ views of the need for theory to support practice and as a basis and rationale for practice in Paper 2. Mentors did feel that, while students had a basic knowledge and understanding, this needed to be deeper in order to underpin practice. Students placed a lot of emphasis on having practical training in the university prior to placements as opposed to theoretical education and stated that this would help them more as a student, while mentors felt that their role would be easier if students had more theoretical preparation.

Students perceived a lack of clinical skills training from the university prior to placement as a barrier to them learning in practice. This was often related to knowing what the ‘right way’ to carry out particular tasks was as conflicting practices where observed in placements. Students felt that it was the role of the university to show them the best practice for each clinical skill was rather than this being the role of their mentors. Mentors, conversely, felt that these practical skills should be taught in practice as different areas had different ways of doing things.

Both students and mentors favoured small group interactive teaching for infection prevention and control as this promoted greater interest, more cooperation between participants and the involvement of quieter, more reserved students. It was also seen as an approach which prompted students to more confidently question what was being taught. Students also liked the idea of practical sessions in skills laboratories following immediately after theoretical sessions so that theory could be related to practice immediately. There was little mention from students of the university and practice placements working together to provide their education – mentors were more enthusiastic about this and saw the infection prevention and control education of students to be a collaborative endeavour between practice and the university settings, though it was acknowledged that this was not always achieved.

Interestingly, students relied on the information supplied by the university to support practice in terms of their perception that anything taught by the university would be more up to date than what was taught in practice placements. However, mentors were quick to highlight that part of their role was to ensure that their students complied with Trust policies and procedures, even if these differed between Trusts. Again this finding
emphasises the existence of variations in practice between health care organisations and how potentially confusing this is for students. In contrast with students’ views, mentors felt that clinicians are better placed to deliver infection prevention and control education; they felt that this would be more up to date than the university information, conflicting with the views of students.

Both mentors and students viewed assessment as a good way of learning, with students expressing a need to be clinically assessed by university lecturers. This finding is concerning as it is the mentor’s role to assess students clinically however students did not seem to perceive this as proper assessment.

Students expressed opinions about how infection prevention and control should be taught and identified clear links between theory and practice and humour as important aspects in education. The person delivering the session was seen to be important as they had to be credible and be able to relate what was said to clinical situations. Again there is the clear suggestion that theory is important to underpin practice but needs to be linked clearly to practice when it is being taught.

Overall, this paper demonstrated some tensions between students’ and mentors’ perceptions of learning needs and what both believe would be beneficial. The main limitation to this paper is that the mentors were from one NHS Trust served by three universities and the students all came from one university. Mentors’ views of students’ knowledge and practice may also therefore reflect views about students from all three universities. However, there is consistency in the views of mentors about students, regardless of which university they represented. This is the first paper that I have identified which considers the infection prevention and control learning education of nursing students as perceived by both students and mentors. The identification of a tension between nurses and mentors regarding the importance of theoretical and clinical knowledge is novel and should be considered in future educational initiatives. These findings should also be relayed to mentors as it is important for them to understand the student perspective.

Paper 4 reported on the attitudes of nursing students and nurse mentors towards the role of the Infection Prevention and Control Nurse. This paper did not originally feature in the research plans however the topic emerged as a strong theme in the interviews with nursing students and the topic was therefore discussed with mentors during interviews. This was the first paper that I have identified that focuses on attitudes towards this specialist nurse role and it is also unique in that it considers attitudes from both student and qualified nurses’ perspectives and considers how they might affect student learning. Three themes emerged from data analysis:

- Student and mentor views of the infection prevention and control nurse role
- The impact of the Infection Prevention and Control Nurse as both observed and experienced
- The qualities of Infection Prevention and Control Nurses that are highly rated by students and mentors

Generally, attitudes towards the IPCN role were negative. Students reported their own experiences with IPCNs and what they had heard staff say about them whilst mentors reported their own views and opinions. Students expressed a fear of the IPCN role, whether just seeing them approach or interacting with them. It could be considered that this fear was associated with views expressed by qualified staff which led to an anticipated negative experience from the students. IPCNs were also perceived to provide impractical advice, to increase workload, to visit only to criticise and not to work in a collaborative fashion. They were clearly not seen by nursing students and mentors as part of the multi-disciplinary team; a finding of great concern given the potentially positive impact of the IPCN on infection rates if they are accepted as a member of a ward team (Venberghhe et al 2002). The lack of collaborative working perceived by both students and staff can have a significant impact on staff motivation to perform in infection prevention and control which in turn can have an impact on care quality and patient safety (Wong et al 2010). IPCNs can be seen as both leaders and managers as well as specialist nurses and therefore need to have leadership and management skills but these were frequently perceived as lacking. Occasionally mentors (but not students) reported finding the IPCN helpful.

However and importantly both mentors and students reported that the presence of the IPCN, though provoking fear and frustration, improved practice as everyone wanted to be seen to be practising optimally. Students were concerned about this as they believed
that if staff could practice correctly when the IPCN was present, they should be able to
do this all the time. They questioned why this was not the case and expressed
frustration. Students were also critical of audits undertaken by the IPCN as these were
often known about in advance and consequently students did not feel that the results
reflected actual practice. The education delivered by the IPCNs was often seen as
boring and repetitive, (albeit felt necessary by students). Perhaps there is a need for
more educational creativity from IPCNs with a more interactive approach to stimulate
staff engagement and motivation. This finding accords with that from previous research
which reported the importance of assessing educational needs before undertaking an
education or training programme as one size does not fit all (Bush et al 2005).

Both students and mentors highlighted qualities that they valued in IPCNs in order to
promote more collaborative working. There was a shared view that many IPCNs
seemed to work rather uncollaboratively and so did not motivate staff to change
practice. Students and mentors expressed a wish that IPCNs could be more
approachable, with a more positive attitude towards clinical staff and less authoritative;
working with rather than undermining ward managers.

Overall, this paper demonstrated that IPCNs have great potential to influence students
and qualified staff but that there is a perception that a more positive collaborative
approach is more likely to achieve improved practice. Again, a weakness of this
research is that mentors worked in a single large NHS Trust and were therefore
commenting on one team of infection prevention and control nurses. Students,
conversely, were commenting on exposure to staff in this role working in various NHS
Trusts throughout their placement experience. That said, there was great consistency in
the views expressed. This is the first paper I have identified which investigates
perceptions of the Infection Prevention and Control Nurse role and its value lies in its
highlighting the challenges inherent in the relationship between the specialist nurse and
clinical staff at ward level. It is intended to highlight to specialist nurses how they
might be seen as more effective leaders and managers and in turn how they might
impact on practice in infection prevention and control.

interview study with nursing students and nurse mentors. *BMJ Quality and Safety* 21
(4); 301-306
Paper 5 reports on attitudes towards the practice of infection prevention and control, both from students and mentors and from both an individual and organisational perspective. Initially this aspect was combined with attitudes towards the IPCN and submitted as one paper to an infection prevention and control journal but the editor considered these two topics too wide in focus and suggested it be divided into two papers. After doing this, the decision was made after discussion with one of the professors to not submit both papers to the infection prevention journal but to approach journals specific to nurse management for Paper 4 and quality for Paper 5.

The themes that emerged were:

- Staff attitudes as perceived by student nurses
- Mentor views of student attitudes towards infection prevention and control
- Mentor views of attitudes towards infection prevention and control in their clinical area

Most students perceived a negative attitude toward infection prevention and control practices in clinical placements, identifying that infection prevention was seen to be an additional workload burden which took too much time. Students themselves viewed infection prevention to be an integral aspect of care though they expressed the opinion that it was seen to be an inconvenience by most clinical staff. There was an attitude that infection prevention cannot be undertaken when there are other things to do, in particular by doctors. Where a positive attitude was reported, this was considered to be due to the media emphasis on infection control.

Mentors generally thought that students had a positive attitude but some expressed the view that students had unrealistic practice and, in some ways, should expect poor practice where there were time and workload pressures. These pressures were also considered to be added to by students who asked questions and were seen to be slow. Despite mentors having a responsibility to teach students, the opinions expressed by some mentors did not seem to reflect this in that they considered that they did not have time to answer students’ questions about infection prevention and control and were inconvenienced by students in their workload.
Despite negative attitudes being reflected in comments by mentors who echoed the student view that it was an additional workload burden, they identified that the attitude towards infection prevention and control was positive in both their area and their organisation, again linking this to the media emphasis on healthcare-associated infection. Mentors did not seem to view their comments as reflecting a negative attitude though when asked whether they thought negative comments could affect students, it was acknowledged that this could have an adverse effect, something which mentors had not previously considered.

The main limitation of this paper is the lack of depth in the discussion sections as required by the journal editors who argued for presentation of qualitative results in tables and less discussion of the results and implications. This leads to, in my opinion, a more superficial paper than was intended and a benefit of this thesis is the opportunity for more in-depth discussion.

Previous papers have considered how attitudes affect compliance and practice in infection prevention and control. Paper 5 considers in more depth attitudes towards infection prevention and control and how these might affect student learning; aspects which have not been identified by myself in previous literature. Since publication of this paper, I have been contacted by several medical professionals across the world who have expressed interest in my work so while it focuses on nursing, it seems to be having an impact among doctors internationally. This is a positive outcome and it is hoped that future work will focus on attitudes in other professions.


Paper 6 was a brief research paper which discussed the application of the Theory of Planned Behaviour to the study of nursing and midwifery students. The Theory of Planned Behaviour is discussed in depth in Chapter 4. This paper was produced as the decision had been made to attempt a PhD by publication and I considered that a methodology paper of some form was appropriate. After looking at different aspects of the research undertaken, this paper and Paper 8 were produced to address methodological issues. While previous papers have been published which discuss the
application of the Theory of Planned Behaviour in infection prevention and control, they do so in terms of behaviour prediction and statistical analysis. This paper considers the theory as more of an analytical lens with which to discuss qualitative research findings, as further highlighted in Chapter 4.

3.7 **Paper 7:** Ward, D. (2013) The barriers and motivators to learning infection control in clinical placements: interviews with midwifery students *Nurse Education Today* 33 (5); 486-491

Paper 7 considered midwifery students’ perceptions of the barriers and motivators to learning appropriate infection control practices in their clinical placements. The themes that emerged were:

- Barriers to good infection prevention and control practice
- Barriers to learning good practice
- Motivators to learning good practice

Preceding this paper, the only paper published internationally which considered the infection prevention and control education of midwifery students in clinical placements was my own Paper 2 which also included nursing students. This is therefore the only paper I have been able to identify which focuses on the infection prevention and control education of midwifery students. This was of concern considering infection risks internationally and reported poor compliance of midwives with infection prevention and control precautions (Ji et al 2005, Bassey et al 2007). Unlike in nursing (NMC 2010), infection prevention and control is not an Essential Skills Cluster in midwifery in the United Kingdom. This may reflect the lack of research in this area if it is not considered by their governing body as an essential skill. All this needs to be considered within the context of the Centre for Maternal and Child Enquiries Report (CMACE 2011) which highlighted sepsis as a major cause of death in pregnant women in the UK. Infection prevention and control should therefore be considered important in all aspects of midwifery practice.

Students identified issues such as the lack of both time and preparation as barriers to complying with infection prevention and control precautions. These issues have also previously been identified as barriers for qualified staff (Chalfine et al 2011). Students also regarded low levels of knowledge about infection prevention and control amongst
clinical staff as a barrier to compliance, an issue previously identified in the literature about qualified staff (Timilshina et al 2011). The fact that the consequences of poor infection prevention practice are not immediately evident or even attributable was seen to promote complacency among staff. There was also the belief that one person could not make a difference; this belief reinforced practices which were the same as those of others, even if sub-optimal. This reflected a view that if others were not complying, being compliant would not make a difference to patients. There were also seen to be competing demands in midwifery which could compromise good practice, an issue highlighted in previous research in terms of emergency situations and compliance with infection prevention and control. Interestingly, the UK economic climate was identified by midwifery students to adversely affect practice, where staff thought they were saving the NHS money by cutting corners.

Students identified four main issues concerning learning good practice in infection prevention and control. Firstly, as with nursing students, midwifery students felt there was insufficient clinically focused education from university staff. Again as with nursing students, midwifery students observed and experienced conflict between what was taught in theory and observed in clinical practice, particularly about the ‘right way’ to carry out certain tasks. There was felt to be a pressure not to perform infection prevention and control by some mentors and students felt that they were being coerced into poor practice in order to do the same as their mentors. There were even reports of students being ridiculed by qualified staff for carrying out procedures properly; this obviously deterred other students from practising correctly in the future. Mentors were considered to have a large influence on student practices as students would copy their mentors, even if the practices demonstrated were not appropriate. As in Paper 2, there was a need to fit in and not be seen as someone who was ‘rocking the boat’.

Facilitators for good infection prevention and control practice specifically highlighted by midwifery students included the focus on babies who were considered vulnerable to infection. However, pregnant women were not regarded as similarly at risk or vulnerable unless their membranes had ruptured. Midwifery units that were considered by students to demonstrate good practices were used as examples on which to base future practices in other clinical areas. Though this could be considered to conflict with following what the current mentor does, students were clear that, even if new placements did not practice in this way, this was the approach to benchmark against. It
was seen by students as very important to act as good role models for new mothers in hand hygiene (for example) and consequently demonstrating good practice was felt to improve standards overall. Role modelling in this way is something that has not previously been considered within the literature in terms of infection prevention control practice or midwifery, though there are some studies which look at peer role modelling for pregnant women (McInnes and Stone 2001). Student midwives considered that having a good knowledge about the science underpinning infection prevention and control facilitated good practice. The monitoring of practice (in terms of spot checks) was regarded as an important strategy to promote compliance with required standards as it was believed that if staff thought their practice was checked they would practice well at all times. This links well with the previous attitudes paper where nursing students talked about audits being more appropriate if they were unannounced. Recent mortality figures in relation to infection in pregnancy were seen by students as important in promoting good practice as this was relevant information which made midwives realise how at risk their patients might be.


Paper 8 discusses the use of Framework Analysis, which was the approach used in this research, in nursing and uses the research with student nurses to act as a worked example in order to demonstrate its application in a practical way. As identified above, this paper was produced to add methodological strength to my PhD by published work. It is the only paper on which I collaborated with others who are part of the Framework Analysis Group within the University in which I work and who were involved in aspects of data analysis within the research undertaken.

Data analysis is discussed in Chapter 2 but this paper discusses in more depth how the analysis process was applied to the nursing research undertaken as part of this thesis.
Chapter 4 The Conceptual Framework which Underpins the Thesis.

It is important that the thesis as a whole presents a coherent narrative of the work undertaken and the contribution that it makes to infection prevention and control education. A conceptual framework was therefore developed to meet this aim; a combination of the Theory of Planned Behaviour and King’s Conceptual Framework. Neither theory / framework individually meets the full requirements of the data collected and analysed throughout the research and combining the two met the requirements of both the research and the thesis. In order to understand the framework overall, both aspects will be discussed separately and then brought together.

4.1 Introduction

The purpose of research in nursing is to either answer questions or solve problems which are relevant to the profession (Silverman 2008). It has been strongly argued that, to be useful, knowledge acquired through research in nursing should be linked to nursing theories (Fawcett 1995, Butts and Rich 2011). Mock et al (2007), for example, argues that nursing researchers should select a conceptual model which provides an appropriate research context as this enables the organization of both data collection and analysis and explanation of the findings within the context of science. Nursing theory has also been said to provide evidence that research improves the efficiency and effectiveness of nursing (Peterson and Bredow 2013). For example, the Shuler Nurse Practitioner Practice Model has been shown to identify gaps in areas such as intervention strategies in school-based health care services and in identifying and clarifying risk factors related to unintended pregnancies in homeless women (Peterson and Bredow 2013). Khowaja (2006) sees the critical role of research in practice as the application of nursing theories to discover new knowledge.

Despite these assertions, however, there is a lack of evidence that not using a theory or framework to guide research impacts on the validity, credibility, importance or clinical impact of the research. While some research tests a framework or theory (for example Fawcett 2010), it is not necessarily the case that all research needs to use or test theory. What also needs to be considered, particularly in health care, is that different professions apply different theories to the same aspects of care. Medicine, for example, applies biological theories, such as instinct theory which argues that motivation is the result of our biological and genetic programming (Maze 1993). Such a theory would
imply that all individuals within a species would have the same motivation which would be an inaccurate assumption in infection prevention and control when rates of compliance differ between individuals and aspects such as gender and profession can affect compliance. While instinct theory is no longer utilized in its original form, the influence of genetics and heredity on human behaviour are still considered within some fields of medicine. Alternatively dentistry might apply models of community involvement to examine the role played by context and community in influencing behaviour such as dental hygiene (Hildebrabd 1994) and midwifery might utilize Soo Downe’s theory combining salutogenesis, complexity theory and authoritative knowledge (Downe and McCourt 2008) which have covered issues such as expertise and the good midwife. All these theories might be used in some way to explain behaviour in terms of infection prevention and control and yet each uses a different perspective. This can be confusing, as if application of theories is seen as important, the use of different theories which may oppose each other to support the same care or treatment needs to be explained and clarified.

In the case of the research under discussion, we are considering qualitative research which can to be both theory generating and theory furthering (Peterson and Bredow 2008). However, the publication of some qualitative research in both nursing and midwifery and in infection prevention and control which does not generate or further theory suggests a lack of support for the mandatory use of theories or frameworks and there is no lessening of the impact of the findings of such research. Qualitative research has been said to be valuable in infection prevention and control in describing behaviours, experiences and interactions (Cole 2006, Forman et al 2008) and yet it has not necessarily used a nursing theory or conceptual framework to guide it. Maudsley (2005) discusses the use of nursing theories in infection prevention and control and, while acknowledging that many models and theories are jargonistic, discusses, for example, Roper, Logan and Tierney’s model and use of maintaining a safe environment as relevant to infection prevention as well as other theories such as Nightingale’s environmental theory and Dorothy Johnson’s Behavioural Systems Theory. Educational theory has also been used in the development of an infection prevention and control link nurse programme (Cooper 2001). However, the majority of infection prevention research does not utilize a nursing model or theory. While nursing theorists might consider that this lessens the research in some way, this is not necessarily the view of practitioners in infection prevention and control or clinical staff. For example,
Yuan et al (2009) used semi-structured interviews to investigate perceptions of practices in hand hygiene. They did not use a nursing theory or framework and did not test, further or develop a nursing theory but their identification of barriers to effective hand hygiene offer knowledge to the specialty of infection prevention and control and the nursing and other healthcare professions which is of value. Similarly, Nichols and Badger (2008) found that actual compliance with infection prevention and control precautions is lower than reported compliance by qualitative means which has important implications for the approaches used to measure compliance in future research. This is despite not using a theory or framework.

However, despite these criticisms this does not necessarily mean that there is no value or benefits to the use of nursing theories or models in research as they can be useful in guiding data collection and analysis. For example, Dee (1990) applied Johnson’s Behavioural Systems Model in one hospital to change the assessment and interventions used in nursing care. She found that the model provided a comprehensive and systematic way of assessing the behaviours of patients, it facilitated the identification of specific areas of patients’ weaknesses and strengths in measurable and observable ways, enhanced continuity and consistency of care, prioritized the provision of care and promoted unity in the practice environment. Holland Wade and Kasper (2006) developed an instrument to measure student nurses’ perceptions of caring based on Watson’s Theory of Transpersonal Caring and it was found to have internal consistency, convergent validity and predictive validity and was therefore a valid and reliable tool which measured perceptions. Altay and Cavusoglu (2013) found that applying Orem’s Self Care Model increased the self care skills of adolescents with asthma when compared with a control group in an experimental design study involving 80 patients. Models and theories have therefore been successfully utilized in nursing, despite criticisms in the literature and the decision to use them should therefore consider this balance.

The main element in the decision to use a framework or theory is the provision of a rationale for its use and to ensure that this use impacts positively on either the interpretation or use of the research findings. I made the decision to use a framework in order to guide the analysis, presentation and discussion of results as discussed in Papers
2 and 6. It is hoped that explanation of how the framework applies to the findings demonstrates further this rationale. A conceptual framework was combined with a psychological theory to produce a new and original overall framework which met the needs of the research. A psychological theory was used as they can be utilised to predict and identify behavior and it is clear that infection prevention and control relates to the behavior of staff in clinical practice.

It has been said that it is not sufficient to state in a research report that a conceptual framework guided a study but that it is important to supply more specific detail (Fawcett and Gigliotti 2002). However, it could also be argued that the value of a research report, which is judged by the target audience, is not necessarily always in a lengthy discussion of the framework used but in the discussion of the research approach taken, the rigour of the research, the results and their implications for practice and future research. It is also the case that within the realms of publication, the requirements of publishers may not allow such in-depth discussion of underpinning theory. This discussion for the research presented is therefore provided here.

4.2 King’s Conceptual Framework / System

Imogene King has a long history of contributing to the advancement of nursing science in terms of both advocacy for the perspective of nursing as a science and specifying the structure and process for developing that body of knowledge (Fawcett 1995). She received a diploma from St. John Hospital School of Nursing, St. Louis, an undergraduate degree from St Louis University and a Masters in Nursing from Columbia University followed by a Doctorate in Education. She served as a professor of nursing at two American universities (Loyola University and the University of South Florida) and though she retired in 1990, she continues to be active in the development and advancement of nursing theory. King (1964) stated that there was a need to focus on and organize the nursing knowledge available at the time and to expand on this knowledge. She developed a conceptual framework (King 1981) in order to facilitate this focus and organization (Figure 1). The system contained the three interacting components of personal (individuals), interpersonal (groups) and social (society) with aspects within each component derived by King (1981) and subsequently developed
further (1997) (see Table 1). These aspects will be discussed in more detail later. From this conceptual framework which she later stated was to be called a *system*, a theory of goal attainment was developed in order to provide structure for the systematic organization and development of new knowledge for nursing (Frey et al 2002). The theory of goal attainment included the basic considerations of the person, the environment, health and nursing in order to achieve goals for patients. The combination of framework / system and theory within King’s work are considered to be relevant in every nursing situation, with the elements of nursing education, practice and research being inter-related in the nursing profession (Brown and Lee 1980). This thesis does not consider King’s Theory of Goal Attainment as while it has been tested and validated in practice (Fawcett 1995), it was not considered relevant for infection prevention and control education, even in the clinical setting. The system was therefore considered in isolation. It has to be acknowledged at this point that the utilization of this conceptual system was not initially considered within the research but rather occurred as a result of journal editor feedback on Paper Two. The editor in question directed that I needed to use a nursing model or framework to discuss my findings in order to demonstrate the advancement of nursing knowledge. I proposed using the Theory of Planned Behaviour but this was rejected by the editor as he was of the view that, as it was ‘*not a nursing theory*’, it could not be used to demonstrate the advancement of nursing knowledge. This is despite the theory’s wide use in nursing research (Cote et al 2012, Jones et al 2013). There was therefore initially an element of coercion in the use of a *nursing theory*. However, when studying nursing theories and models in order to identify which was a fit with the findings of the research, King’s system emerged as the most clearly applicable. It was a system that I was unfamiliar with and it therefore had to be studied in great detail in order to apply it to the research undertaken. The more it was studied, the more applicable it became and I was persuaded by what I read that this was an appropriate framework to use.
This chart represents the conceptual framework in terms of the three interacting systems within it. King hypothesized that all three systems were linked and worked together to form a framework. King summarises the conceptual framework as follows: 'nursing phenomena are organized within three interacting dynamic systems: (1) personal systems (individuals); (2) interpersonal systems (dyads, triads and small and large groups); and (3) social systems (family, school, industry, social organizations and health care delivery systems’ (King 1989 p151). When two or more personal systems interact, interpersonal systems are formed and so on, linking the three systems together. King also stated that the concepts within each system shown in Table 1 could be moved across systems.

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Table 1 – Components within King’s 3 interacting systems and their meanings according to King

<table>
<thead>
<tr>
<th>SYSTEM AND COMPONENTS</th>
<th>KING’S INTERPRETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PERSONAL – social beings who are rational and sentient</strong></td>
<td></td>
</tr>
<tr>
<td>Perception</td>
<td>‘A comprehensive concept in personal systems, a process of organizing, interpreting and transforming data from sense data and memory. It gives meaning to one’s experiences, represents one’s image of reality and influences one’s behaviour’ (King 1981 p24)</td>
</tr>
<tr>
<td>Self</td>
<td>‘A composite of thoughts and feelings which constitute a person’s awareness of his individual existence, his conception of who and what he is’ (King 1981 p27)</td>
</tr>
<tr>
<td>Growth &amp; Development</td>
<td>‘Include cellular, molecular and behavioural changes in human beings, are a function of genetic endowment, meaningful and satisfying experiences and an environment conducive to helping individuals move towards maturity’ (King 1981 p30-31)</td>
</tr>
<tr>
<td>Body image</td>
<td>‘A person’s perception of his own body, others’ reactions to his appearance and is a result of others’ reactions to self’ (King 1981 p33)</td>
</tr>
<tr>
<td>Category</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Time</td>
<td>‘The duration between occurrence of one event and the occurrence of another, the term is used to give order to events and to determine duration based on perceptions of each person’s experience’ (King 1981 p45)</td>
</tr>
<tr>
<td>Space</td>
<td>‘Existing in all directions and is the same everywhere…as the physical area called territory and by the behavior of individuals occupying space’ (King 1981 p37-38)</td>
</tr>
<tr>
<td>Learning</td>
<td>Added later and not defined</td>
</tr>
<tr>
<td>Spirituality</td>
<td>Added later and not defined</td>
</tr>
<tr>
<td>INTERPERSONAL – composed of two, three or more individuals interacting in a given situation (King 1981 p54)</td>
<td></td>
</tr>
<tr>
<td>Interaction</td>
<td>‘The acts of two or more persons in mutual presence, can reveal how one person thinks or feels about another, how each perceives the other, what is expectations are of the other and how each reacts to the actions of the other’ (King 1981 p85)</td>
</tr>
<tr>
<td>Communication</td>
<td>‘The vehicle by which human relations are developed and maintained’ (King 1981 p79)</td>
</tr>
<tr>
<td>Transaction</td>
<td>‘A process of interaction in which human beings communicate with environment to achieve goals that are valued. Transactions are goal directed human behaviours’ (King 1981 p82)</td>
</tr>
<tr>
<td>Role</td>
<td>‘A set of behaviours expected when occupying a position in a social system, rules or procedures define rights and obligations in a position in an organization, role is a relationship with one or more individuals interacting in specific situations for a purpose’ (King 1981 p93)</td>
</tr>
<tr>
<td>Stress</td>
<td>‘A dynamic state whereby a human being interacts with the environment to maintain balance for growth, development and performance, which involves an exchange of energy and information between the person and the environment for regulation and control of stressors’ (King 1981 p98)</td>
</tr>
<tr>
<td>Coping</td>
<td>An essential area of knowledge but not defined or described by King</td>
</tr>
</tbody>
</table>

**SOCIAL – an organized boundary system of social**
<table>
<thead>
<tr>
<th>roles, behaviours, and practices developed to maintain values and the mechanisms to regulate the practices and rules (King 1981 p115)</th>
<th>‘Composed of human beings with prescribed roles and positions who use resources to accomplish personal and organizational goals’ (King 1981 p119)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization</td>
<td>‘A transactional process characterized by active, reciprocal relations in which members’ values, background and perception play a role in defining, validating and accepting the authority of individuals within an organization. One person influences another, and he recognizes, accepts, and complies with the authority of that person’ (King 1981 p124)</td>
</tr>
<tr>
<td>Authority</td>
<td>‘The process whereby one or more persons influence other persons in a situation. Power defines a situation in a way that people will accept what is being done while they may not agree with it’ (King 1981 p127)</td>
</tr>
<tr>
<td>Power</td>
<td>‘The position of an individual in a group or a group in relation to other groups in an organization’ (King 1981 p129)</td>
</tr>
<tr>
<td>Status</td>
<td>‘A dynamic and systematic process by which goal-directed choice of perceived alternatives is made and acted upon to answer a question and attain a goal’ (King 1981 p132)</td>
</tr>
<tr>
<td>Decision making</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>Added later but not described or defined by King.</td>
</tr>
</tbody>
</table>
King (1981) considered that people’s perceptions of objects, persons and events influence their behavior, social interactions and health, all relevant to infection prevention and control in the research under discussion. King considered that the concepts in all three systems within the framework are inter-related and it is argued that all three systems need to operate as a whole to achieve maximum benefit (Khowaja 2006). However, there is a lack of research evidence to support this assertion as much of the King-related research focuses on the Theory of Goal Attainment which is based on the framework. The research is therefore not directly related to the Framework. Despite this, since its development the conceptual framework has been utilized in various aspects of nursing. It was found to be useful in serving as a guide in developing objectives in curriculum development (Gulitz and King 1988). It was utilized here as a framework within which to develop a nursing curriculum. Gulitz and King (1988) identified that there was an inter-relationship between the philosophy of nursing education, the conceptual framework, the rationale of the curriculum and the objectives of the nursing programme in this particular piece of literature. However, these assertions are not based on empirical evidence and appear to be more concerned with the views of the authors about the use of the framework within their own curriculum. Goodwin et al (2002) used the conceptual framework as a foundation for an advance directive decision making model so rather than testing the efficacy of the framework in practice, they used it as a basis for theory development. It therefore assisted in developing another theory. In a more research-based argument, Murray and Baier (1996) highlighted that the application of the framework in a transitional living programme led to the majority of 228 mentally ill homeless clients being placed into housing by the time they had left the programme. In this study, the conceptual framework was used for goal attainment which is more reflective of the theory that King developed herself from the framework. It assisted in the planning of care in terms of the three systems (personal, interpersonal and social) for the patients involved, however.

Fawcett (1995) presents a full discussion of the framework and attempts to analyse it critically but she does this by generally referring to what King herself has said about it. However, one issue worthy of note is that King never meant the framework or resulting theory to guide practical activities (King 1989). King (1989) stated that we do not necessarily guide practice with theory or apply theory to practice but what we apply is the knowledge generated by the theory. This certainly raises questions about research.
published to apply her theory to practice when this was not the purpose of the framework or theory.

The conceptual framework or the knowledge generated from it appears to have been applied widely within both nursing practice and nurse education since its inception. As the research undertaken here was concerned with the education of nursing and midwifery students in clinical placements, King’s conceptual framework was considered an appropriate framework within which to discuss the research findings. King’s conceptual framework was considered applicable to the interactions that occur within practice placements between students, their mentors and other staff and how these impact on student learning in infection prevention and control and ultimately patient care.

King (1981) has identified that individuals’ interactions within social systems actually influence the behaviour within those systems. While she considered this in terms of nursing practice and interactions between nurse and patient / client, it is argued here that interactions between mentors, nursing and midwifery students and other staff working in healthcare can have an effect on the behaviour of both students and mentors in practice. While this may seem like a very basic observation, rooted in psychology, it also agrees with the assumptions made by King within her framework and is therefore mentioned here. Some of the assumptions made by King about nurse-patient interactions have been applied here to interactions that students have with staff in clinical areas. King (1981) identifies some of these assumptions as follows:

- The perceptions of nurse and patient influence the interaction process – it is argued here that the perceptions of students and qualified staff about both infection prevention and control and the education of students can influence the interactions that they have with each other and therefore their practice and learning
- The goals, needs and values of both nurse and patient influence the interaction process – in the application of the framework here these aspects are considered in relation to students and mentors and how these effect the interactions with each other and the care that they provide to their patients
- Individuals have the right to participate in decisions that influence their life – within this context, it is considered that students are involved in some way in decision-making about what they learn and their overall education in nursing
• The goals of nurse and patient may be incongruent – it is argued here that the expectations of mentors and students may differ and this may have consequences both for practice and for student learning.

Therefore while the assumptions made by King are based on nurse-patient interactions, the concepts can also be applied to interactions that nurses have with others in practice situations. All assumptions may also be considered across systems as King (1981) acknowledges that the placement of individual concepts within each system is arbitrary as all concepts are related when human beings interact with their environment; in this case nursing and midwifery students and mentors in clinical placements. Table 2 demonstrates how each of King’s concepts have been interpreted to discuss the findings of this research.

Table 2. The application of King’s framework to the research

<table>
<thead>
<tr>
<th>SYSTEM WITHIN KING’S FRAMEWORK</th>
<th>INTERPRETATION IN THIS RESEARCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERSONAL</td>
<td></td>
</tr>
<tr>
<td>Perception</td>
<td>How students see themselves, patients and others and infection prevention and control as a speciality and how this affects their practice and learning.</td>
</tr>
<tr>
<td>Self</td>
<td>How students perceive themselves in relation to others and how students see themselves as influencing patient outcomes through infection prevention practice.</td>
</tr>
<tr>
<td>Growth &amp; development</td>
<td>How students develop in terms of practice and learning and what affects this.</td>
</tr>
<tr>
<td>Body image</td>
<td>Not applicable to the study.</td>
</tr>
<tr>
<td>Time</td>
<td>As a factor in compliance with infection prevention and control and how it affects teaching between mentors and students as a constraint</td>
</tr>
<tr>
<td>---------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Space</td>
<td>Not applicable to the study</td>
</tr>
<tr>
<td>Learning</td>
<td>What students and mentors learn from each other and how they do this</td>
</tr>
<tr>
<td>Spirituality</td>
<td>Not applicable to the study</td>
</tr>
<tr>
<td>INTERPERSONAL</td>
<td>How students and mentors perceive each other and what the expectations are of students from mentors</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Interaction</td>
<td>How students and mentors interact with each other and how they communicate with each other – also what affects the effectiveness of this.</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
</tr>
<tr>
<td>Transaction</td>
<td>How students achieve their goals and how mentors help or hinder this process.</td>
</tr>
<tr>
<td>Role</td>
<td>How students perceive their role in infection prevention and control, and in relation to others in their placement and how this impacts on other aspects such as stress and their interactions with others.</td>
</tr>
<tr>
<td>Stress</td>
<td>How this is caused to students by being in placement and to mentors by having to teach and mentor students</td>
</tr>
<tr>
<td>Coping</td>
<td>How students cope with practice placements in terms of theory-practice links and viewing conflicting practices.</td>
</tr>
<tr>
<td>SOCIAL</td>
<td>The university and NHS Trusts</td>
</tr>
<tr>
<td>-------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Organisation</td>
<td>The university and NHS Trusts</td>
</tr>
<tr>
<td>Authority</td>
<td>How both students and mentors perceive who is in authority and how this influences practice and learning.</td>
</tr>
<tr>
<td>Power</td>
<td>The relationship between mentor and student and how students perceive their level of power in their own practice</td>
</tr>
<tr>
<td>Status</td>
<td>How students view themselves in relation to others</td>
</tr>
<tr>
<td>Decision making</td>
<td>How students and mentors perceive their role and autonomy in making decisions about practice and learning and what influences this</td>
</tr>
<tr>
<td>Control</td>
<td>The perceived level that both students and mentors feel that they have in relation to practice and learning and in relation to other factors such as power and decision making</td>
</tr>
</tbody>
</table>

4.2.1 Personal system

The personal system within the conceptual framework contains the concepts of perception, self, growth and development, learning, body image, space, spirituality and time. Body image and spirituality were not considered to be relevant concepts within the research under discussion which reflects Fawcett’s (1995) notion that not all concepts within the framework are utilised within most research utilising King’s model. Within the research undertaken, several aspects of the findings were applicable to these concepts. Each staff member can be considered a personal system and therefore this
system within the framework seems applicable to situations where the interactions are between staff and students as opposed to patients and staff which is where the framework is usually applied (Murray and Baier 1996).

Students expressed views of themselves within the concept of Self in relation to their own past experiences, where they felt themselves to be in relation to others and their levels of confidence. They also had their own perceptions of what good practice was in infection prevention and control. Students had expectations of and beliefs about placements prior to attending – sometimes these were met and at other times they were not. This is supported by George’s (2002) argument that perception is based on the information that is available and can be subjective, with situations being experienced individually by those involved. Students also discussed how their practices had developed and improved during the course of their nursing / midwifery programme and considered the consequences of poor practice that they perceived which relate well to the concepts of growth and development and learning within the personal system.

Mentors discussed their views and perceptions of themselves and others as mentors and the fact that qualified staff can influence the clinical practices of students, both positively and negatively by their teaching. This was therefore considered to have the same impact on student learning. The attitudes of staff towards infection prevention and control were also perceived to have an impact on learning. This is important within this system of the framework as King (1981) viewed perception as the most important variable within the system due to its effect on behaviour. In these studies, where we desire students to learn good practice, and therefore behaviour, in infection prevention and control, the perceptions of both students and mentors about infection prevention and control and about each other’s roles are therefore vital.

Time was often considered to be a barrier both to good practice and to educating students. Murray and Baier (1996) identify time within the system as a continuous flow of events which they consider as suggesting events changing as they move forward. In infection prevention and control education we aim to change or improve practice and promote good practice so that these practices are taken forward by future practitioners. This is of benefit to both the profession and to patients and clients in terms of quality of care and reduced risk of infection.
4.2.2 Interpersonal system

This system includes the concepts of human interactions, communication, transaction, role and stress, all considered relevant within this research. Within the research undertaken, several student-related concepts were identified within this system. Students expressed their views about how qualified nurses communicated with them, both positively and negatively, and how this might impact on their learning. King (1981) argued that communication involves not only the exchange of information but the processing of it and the way in which qualified staff communicate with their students is just as important here as the information or knowledge that they wish to confer.

Students also discussed interactions in the university setting, valuing more interactive teaching methods which were seen to build confidence in quieter students. Role models in practice were also discussed, both positive and negative, and students considered how positive role models enabled them to judge good practice as students were influenced by those who were seen as experts by others and who could explain and justify their practices. This also links with the personal system in terms of roles. Mentors in practice assume various roles within their profession, mentor being just one of them. Observation by students of and interaction with them within these differing roles can affect students within both the personal and interpersonal systems. This interaction of systems is emphasized by Frey (1996) who highlights that role, while being placed within the interpersonal system, is also related to both the personal and social systems. This is due to a person’s behaviour being influenced by perception which is considered within the personal system; and organizational expectations of roles within the social system. Students themselves saw their own role as being confusing, particularly in relation to others and the hierarchy within healthcare, which forms a link with social systems in terms of organizations, supporting the view of interacting systems within King’s framework. There was a general fear of reporting poor practice in terms of consequences for their progression and students identified observed responses from qualified nurses to challenges to their practice from students, reflecting that negative interactions can affect confidence and learning. The research identified that the interpersonal system of King’s Conceptual Framework highlights both positive and negative aspects of nursing practice, for example by considering how concepts such as interaction and communication are applied by both nurses and students. King’s
framework provides a basis for considering these issues in nurse education and how they might be addressed and improved.

When considering feelings and perceptions from qualified nurses, how they saw their role in the education of students was considered within the interpersonal system, though as previously stated it also links with varying roles in the personal system. How they interacted with students during teaching was also discussed, with some mentors identifying nurses who were poor teachers and who lacked confidence in their abilities with students and how this might impact on students. Dealing with poor practice student practice and the stress of fitting in the education around other responsibilities were also considered to be within the interpersonal system of the framework. Students had difficulties coping with the responsibility of reporting poor practice, perceiving a dichotomy between being an advocate and being in the position of reporting poor practice which may affect their placement outcome and how they are themselves perceived by others. This also relates to transaction as mentors were, in some ways by their attitudes and reactions, impeding students’ ability to deal with observed poor practice.

4.2.3 Social System

This system includes the concepts of organization, authority, power, status and decision making as discussed in table 2. Nursing and midwifery students considered their position and status within the healthcare organization to be lower than others and there was a deferment to those who they saw as being superior or more powerful, even if this meant ignoring or accepting poor practice. Power was also considered to affect decision making in relation to reporting poor practice to others and in challenging poor practice, in particular in relation to the possible effects of such decisions on their placement outcomes. The link between theory and practice in decision making was also identified by students. The Infection Control Nurse was identified as an authority figure who often caused fear and concern in both students and qualified staff. Goodwin et al. (2002) identify that the knowledge, skills and expertise of qualified nurses can be used to support the power of their clients but this is also considered applicable to the relationship between student and mentor. While students may be considered to have some power in their own decision-making in practice in terms of whether they comply with infection prevention and control or not, this has to be supported by the knowledge and skills of the qualified staff with whom they work. If this is not the case, the power...
of the student within the system is diminished and their decision making may be adversely affected.

Mentors were more focused on how the organization within which they worked supported them in their role in educating students. As qualified nurses they identified that they were able to exert authority over students in order to challenge and improve practice. However, mentors also considered the power that they have as role models (as mentioned previously) in that they may actually pass on poor practice to students, again demonstrating the view of King (1981) that the systems within the framework are inter-related. The goals set by groups and individuals need to focus on the goals of the social system which is being served (Gulitz and King 1988), in this case the healthcare or education systems. It is therefore important that individuals within the system are supported to achieve the goals of the organization, though it was clear within this research that this support was not always present or perceived.

King’s Conceptual Framework has been utilised here to organise the findings of the research within the concepts identified by King. However, this Framework alone was not sufficient and it was therefore combines with a psychological theory, now to be discussed.

4.3 Use of the Theory of Planned Behaviour

4.3.1 The Theory

The theory of planned behaviour (Ajzen 1985) is based on an assumption that people are rational, make use of information in a systematic way and consider any implications to their actions before behaving in a specific way (Kretzer & Larson 1998). A diagrammatical representation of the theory is shown in Figure 2. Ajzen (1985) postulates that the greatest predictor of behaviour is intention and that this is impacted upon by three main aspects: attitude towards the behaviour, subjective norm and behavioural control. Sutton (1998) explains that the Theory of Planned Behaviour was an extension of the theory of reasoned action so that its application could include behaviours that are not completely under volitional control, relevant to infection prevention and control education in nursing and midwifery where external influences such as peer pressure and resources affect behaviour. He goes on to explain that skills, opportunities and resources are needed for a behaviour to result. The Theory of Reasoned Action (Fishbein and Ajzen 1975) is a model which predicts behavioural
intention and was derived from social psychology. Attitudes and subjective norms are considered to be factors which impact on intention. The Theory of Planned Behaviour adds to the Theory of Reasoned Action as it includes the concept of perceived behavioural control which is a person’s belief that they have control over their own behaviour despite their being potential barriers. So for example, in infection prevention and control a student may believe that they will be able to comply with hand hygiene despite barriers such as time and workload. This belief would then directly influence the intention to perform hand hygiene and thus, though indirectly, the actual performance of hand hygiene in practice. However, what needs to be considered here is that a person may perceive they have control over a behaviour (perceived behavioural control) and may intend to behave in a specific way but if this perception of control is flawed and someone or something else has more control, the intended behaviour may not occur. For example, if there is no access to hand hygiene facilities, despite intending to perform hand hygiene, external influences prevent the behaviour. The belief of behavioural control can also be affected by past behaviour, for example if the student has previously been a health care assistant who did not comply with hand hygiene or past success or failure at a behaviour. This is said by Morrison and Bennett (2006) to be very similar to the construct of self efficacy. So for example, if a person has never had to challenge poor practice previously they may have a different belief of perceived behavioural control than a student who has successfully challenged poor practice before. This latter student may therefore be of the belief that is will be easy to challenge poor practice again.

Attitude towards the behaviour is a reflection of the individual’s value judgement about whether the action is a positive thing. It has its basis in an evaluation of how desirable the outcome of a behaviour is. For example, a student may see reduced risk of infection to a patient as a desirable outcome and therefore view the action of the use of gloves and aprons when dealing with open wounds as a positive one.

The subjective norm reflects the consideration of the views of significant others and the motivation to comply with the wishes of these others. This is relevant in infection prevention and control education as a mentor may be seen as a significant other by a student and the student may wish to comply with what the mentor advises, despite knowing that this may be poor practice. Ajzen (1985) therefore postulates that all three aspects (attitude towards behaviour, perceived behavioural control and subjective norm)
combine to affect intention to perform the behaviour which directly impacts on whether the behaviour is performed. However, this does not mean that if there is a positive intention this will definitely result in the required behaviour – the postulation is that intention is the main predictor of behaviour.

An example of its use in practice is presented by Astrom and Nasir (2009) who used the Theory of Planned Behaviour to predict intention to treat HIV infected patients among medical and dental students in a cross-sectional study. Self-administered Theory of Planned Behaviour questionnaires were completed and the three aspects within the Theory of Planned Behaviour were found to be key factors in students’ willingness to treat HIV and AIDS infected patients, with attitudes being the strongest predictor of intention. The authors made a modification to the original Theory of Planned Behaviour, however, and added moral norms to subjective norms so that both could be considered alongside each other. The authors considered that the three aspects of the Theory of Planned Behaviour which impact on intention should be the targets of interventions to improve health care delivery in the HIV / AIDS context. However, this study did not measure actual behaviour and stopped at actual intention which, as previously noted, Ajzen (1985) identifies as the main predictor of behaviour. This study does not prove that this is the case, however, and did not aim to do so. Ajzen (1991) has also acknowledged that there may be a need, as in this study, to include additional
variables if it can be demonstrated that they have a significant impact on the behavioural outcome as a number of studies have suggested that issues such as past behaviour may also have some impact on behavioural intention after the theory has been taken into consideration (Rhodes and Courneya 2003, Yzer et al 2004).

4.3.2 Research Using the Theory of Planned Behaviour

Research using the Theory of Planned Behaviour has generally reported that it can predict a wide range of behaviours (Armitage and Connor 2000, 2001) from a literature review and meta-analysis. Armitage and Connor (2000, 2001) found that the Theory of Planned Behaviour accounts for 39% of variance in intention and 27% of variance in behaviour. This suggests that the Theory of Planned Behaviour does predict behaviour to a large extent when taking into consideration other factors which may affect behaviour. However, alone it does not always fully predict behaviour, though this is not necessarily meant to be the purpose of the theory. It also has other critics. Rutter and Quine (2002), for example, question its lack of inclusion of temporal elements such as moral norms, anticipated regret, anticipated affect and self identity. It has also been criticised for its subjectivity and its neglect of vital social variables (Schwartzer 1992). Godin and Kok (1996) argue that the prediction of behaviour from variables within the Theory of Planned Behaviour is significantly lower than the prediction of intention. In a review of the Theory of Planner Behaviour’s application to health behaviours, they found that the components of the Theory of Planned Behaviour explain an average of 41% of the variance in intention, again therefore predicting intention in a significant number but not all cases due to other factors. They further identified that the Theory of Planned Behaviour predicted behaviour in 31% of occasions in prospective studies. Ajzen (1985) claims that other variables which are not presented within the model would not account for any additional prediction of behaviour or intention but this has been challenged by other authors who have highlighted other factors that provide additional variance in intention and behaviour. It has been recognised by Evans and Norman (2002), for example, that some intentions and subsequent behaviours are partially motivated by moral norms and in particular behaviour that involves others. Self-identity has also been considered as a factor in that how people perceive themselves may influence intention above the effect of Theory of Planned Behaviour variables (Sparks and Shepherd 1992). In this paper, Sparks and Shepherd (1992) added self identity and past behaviour to improve prediction of intention though this was related to diet in patients rather than the behaviour of health care workers.
Although their initial hypothesis was that a relationship between self identity and intentions which were independent of the role of attitudes would not be proved, this was not the case. Self identity had a substantial independent effect on intention and this effect persisted when considered in relation to past behaviour. Self identity, in this study, therefore seems to be a factor outside of the three proposed initially by Ajzen (1985) which affects behavioural intention and may therefore have a significant impact on behaviour. Perugini and Bagozzi (2001) discuss anticipatory regret and highlight that anticipation that regret would be the consequence of certain behavioural decisions could influence future intention and behaviour. They developed a new model of purposive behaviour and hypothesised that desires were the main causes of intentions, as opposed to the traditional factors used in Ajzen’s (1985) theory. In addition, they modelled perceived consequences of goal achievement and goal failure as anticipated emotions which function as desire determinants. They tested their revised model in two Italian studies involving 230 participants and concluded that desires fully mediated the effects of the three usual predictors of intention. They also reported that their model explained significantly greater amounts of variance than the traditional theory. It is therefore clear that factors outside of the core aspects of the Theory of Planned Behaviour may have an impact on behaviour and that adaptations now need to be made to the original model to explain or predict behaviour.

The Theory of Planned Behaviour has generally been utilised in research which tests or validates the theory. There is, however, a small body of research which reports on the theory’s use other ways. Zoellner et al (2012) applied the Theory of Planned Behaviour to investigate the three predictors of intention and therefore behaviour in relation to the consumption of sugary drinks. Eight focus groups were conducted using a semi-structured guide based on the Theory of Planned Behaviour and when data were analysed codes were related to the major themes within the Theory. Although the themes and subthemes identified provided critical insight and understanding, according to the authors, there was no evaluation within the study of the effectiveness of the Theory of Planned Behaviour in its application as a guide for focus group discussion. Dwyer et al (2005) also used focus groups within the framework of the Theory of Planned Behaviour in two acute care hospitals in rural Australia in relation to beliefs about defibrillation. The questions posed within the focus groups were designed to elicit beliefs within the Theory of Planned Behaviour framework and data analysis identified two behavioural beliefs, four control beliefs and four normative belief
categories. This research provides more support for the Theory of Planned Behaviour in informing focus group questions as themes within each of the three concepts affecting intention were identified from the research. However, there is again no discussion within the research about the efficacy of the use of the Theory of Planned Behaviour in the research as the main emphasis is on the results in terms of beliefs about defibrillation. Mirkuzie et al (2011) used three focus groups to inform the development of a Theory of Planned Behaviour questionnaire regarding intention to be tested for HIV antenatally and whether patients actually were tested. Although the authors state that the Theory of Planned Behaviour explained a substantial amount of variance in intention to be tested, it was less reliable in explaining HIV testing, that is actual behaviour. While most of the research using the theory validates it, it was intended in the research in this thesis to be used as an interpretive lens. The theory has previously primarily been utilised in data collection but I decided to use it in this case in data analysis as this was a more naturalistic set of studies with a more open mind, with the Theory of Planned Behaviour emerging as an appropriate framework.

4.3.3 The use of the Theory of Planned Behaviour in infection prevention and control
The Theory has been utilised in infection prevention and control previously. Askarian et al (2011) used a self-administered questionnaire based on the Theory of Planned Behaviour to identify predictors of handwashing in hospital and community settings in Iranian healthcare workers. They identified several predictors including compliance with similar practices which reflects the earlier discussed view that previous positive experience will impact on future behaviour. They also noted that the perception of handwashing requiring little effort and peer pressure affected reported behaviour. Attitudes towards handwashing were also identified. There is little detail reported in this literature and the outcome was self-reported handwashing behaviour the results may therefore be more reflective of intention as opposed to actual behaviour. However, it needs to be remembered that Ajzen (1985) identified intention as the main predictor of behaviour. In order to understand adherence to hand hygiene, O’Boyle et al (2001) considered the Theory of Planned Behaviour and generated a model from their research to explain the concept. They tested an explanatory model for compliance with hand hygiene based on the Theory of Planned Behaviour and found that the three Theory of Planned Behaviour variables predicted intention to comply with hand hygiene and this intention was related to self-reported practice. This research, then, again supports the use of the Theory of Planned Behaviour in predicting intention but not necessarily
behaviour. This was supported by another aspect of this study which found that the correlation between self-reported and observed compliance with hand hygiene was low and that actual practice was predicted by variables such as workload and time of the day rather than the Theory of Planned Behaviour variables. They therefore concluded that motivational factors may have less impact on hand hygiene practice than issues such as intensity of work activity. Kretzer and Larson (1998) examined several behavioural theories including the Theory of Planned Behaviour. Their view was that, when planning a theoretically based intervention to improve infection prevention and control practices, the constructs that have been consistently shown to be predictors of or have a strong influence on behaviour should be incorporated. They identified beliefs, perceived health threat, cues, attitude, self efficacy, subjective norms, perceived behavioural control, intention and the stages of change and suggested that the organisational context and factors within the working environment should be considered to maximise the effectiveness of any intervention. This assertion and the identification of factors was based on reviewing literature surrounding behavioural models in areas outside of infection prevention and control and therefore issues identified may not necessarily be transferable. However, previous literature which discusses work factors which influence infection prevention and control compliance such as workload and staffing levels (Bignardi and Askew 2000, Baldwin et al 2010) does somewhat support what Kretzer and Larson (1998) have identified.

4.3.4 The use of the Theory of Planned Behaviour in this research
Paper 6 reports on the application of the theory in the student research. A decision was made to use the three initial concepts of behavioural attitude, subjective norms and perceived behavioural control within the Theory of Planned Behaviour as the theory was not applied to predict intention or behaviour but primarily as an analytical lens to explain the findings of the research. Adaptations were, however, made. The three concepts were considered twice in terms of factors affecting the concepts before placement while in university and factors which occur once in placement which may have an impact on the three concepts and therefore on intention and behaviour. For example, information about infection risks provided by the university might have an impact on the student’s attitude towards complying with infection prevention and control precautions but once out in practice, the attitudes of clinical staff might have an impact on the attitudes of the student and therefore change their intention to comply.
4.4 The resulting conceptual framework

What seems clear is that the Theory of Planned Behaviour in its original form does not completely predict intention or behaviour, though this would be impossible, and that other variables such as organisational and workplace factors and self identity need to be considered which have been identified within the research being discussed in this thesis. Many of these aspects are part of King’s conceptual framework and the combining of the two therefore seems appropriate in underpinning this research and thesis.

All three systems within King’s conceptual framework (personal, interpersonal and social) have an impact on all three factors in the Theory of Planned Behaviour (behavioural attitude, subjective norms and perceived behavioural control) and vice versa. For example, perception within the personal system impacts on attitudes towards behaviour in terms of how students perceive infection prevention and control and its importance to their client group prior to placement. Perception also affects subjective norm as it is the student’s perception of what is normal practice that affects their behavioural intention. The student’s perceived level of control has clear links with perception within the personal system. Growth and development within this system also has an effect in terms of the view that one person cannot make a difference which could possibly suppress development, the need expressed by some mentors for staff who were better at educating students, staff and student expectations and concerns about passing or failing placements. This latter point can affect growth and development if students are accepting and in a way collaborating with others in poor practice as it will affect their education and practice. Time is one aspect of King’s Framework which affects the perceived level of control once in practice as time was considered a barrier to good practice and one of the reasons for non-compliance with infection prevention and control precautions.

Within the interpersonal system, human interactions and communication affect perceived level of control in terms of both the power and authority of the student and mentor and the respect that students have for qualified staff as people that they see as being senior to them, even when their practice is observed to be sub-optimal. Human interactions also relate to the subjective norm with role modelling being predominant and expectations being expressed by both students and mentors. They additionally impact on attitude towards behaviour because communication between students and qualified staff reflects their attitudes and can have an effect on the attitudes of students.
themselves. The roles that people have within the interpersonal system also have a clear impact on all three aspects of the Theory of Planned Behaviour. There are issues about what students perceive their role to be, both as learners and as nurses. There is also the role which mentors see they have in education and what they feel the role of the university is. Role modelling is a clear concept across all three systems. This does add some credibility to the idea of the three systems within the framework being connected and possibly working together. The role of the student in comparison to the mentor also needs to be considered as having respect for superiors in terms of not challenging practice and not reporting poor practice affects the perceived level of control. Interpersonal relations can also impact on attitudes towards behaviour, subjective norm and perceived level of control in terms of whether the student would confront the mentor and challenge practice, whether the attitude of the mentor affects the attitude of the student and the perceptions of students in relation to what is considered normal practice as demonstrated by their mentor who they have a relationship with throughout the practice placement.

Within the social system, the organisation of both the university and practice placement areas can have an impact on the aspects within the Theory of Planned Behaviour. If we consider the perceived level of control, organisation issues in terms of support for infection prevention and control and the university and placements working together were identified. Authority, power and status can affect the student’s perceived level of control in terms of their practice and whether they can challenge poor practice. Student perceptions impact on subjective norm and can be affected by power and status. One student interviewee, for example, identified student nurses as ‘the lowest of the low’. The power and status that students perceive they have can also impact on their attitudes towards compliance in relation to whether they have the power to practice against what is being practiced in their placement area. Decision making also needs to be considered here as students can make decisions about how they practice but these are based on all three aspects of the Theory of Planned Behaviour and within the social system as many factors affect their decision making such as their own attitudes and the attitudes of others, what they consider to be usual practice and what they consider to be their position in relation to others such as who has power over their decision making.
Chapter 5. Discussion / Conclusions

5.1 New knowledge arising from the research
This research was novel in several ways. Firstly, midwifery students’ knowledge and experience of infection prevention and control had never previously been studied. Secondly, students’ and mentors’ attitudes to the role of the infection prevention and control nurse had not been previously studied and finally I have not been able to find previous research that has looked at both the student and mentor perspective on infection prevention and control education.

By exploring the experiences of midwifery students we now know about several aspects that were previously unexplored and have additionally built on some previous research carried out using other health care staff. We have gained new knowledge about the barriers to good infection prevention and control practice in midwifery, in particular about competing demands in emergency situations; the economic climate and the perception that one person cannot make a difference. We also now know that there are midwifery-specific facilitators to good practice including the perceived vulnerability of babies, national documents about infection in maternity care and the role modelling of good practice to new mothers. In terms of building on previous knowledge in infection prevention and control, we now have evidence that some barriers and facilitators in other professions are also similarly perceived in midwifery including compliance barriers, knowledge (as both a barrier and a facilitator) and complacency. It is now clear from the research undertaken that, while some of the reasons identified for poor practice are the same across professions, there are some which are more specific to midwifery.

This research has also identified that poor practice can become accepted as the ‘norm’ by mentors who may perceive that university-based education is too idealistic and needs to be more ‘realistic’. The view that barriers to good practice such as complacency, workload and lack of knowledge should be accepted without necessarily being addressed and that students should perceive this acceptance as normal practice contributes to knowledge in this area which has serious implications for practice and learning. It is clear that in some areas, barriers to good practice in infection prevention and control are not investigated and acted upon in order to improve practice but are instead accepted as an inevitable aspect of nursing or midwifery.
The role of the Infection Prevention and Control Nurse is under-researched and we now have new insights as discussed in Paper 4. Both mentors and nursing students were generally negative towards the role and towards education and audit in infection prevention and control; this attitude has a potentially detrimental effect on both practice and learning in nursing. Participants suggested how the infection prevention and control nurse role could be adapted to be more beneficial and how infection prevention and control nurses might work better with their clinical colleagues. There were also suggestions made about how infection prevention and control audit might be carried out more effectively so that it is more reflective of true practice and, in consequence, more useful in improving practice.

Considering infection prevention and control education from the perspectives of both students and mentors within this research has the benefit of triangulating data, later discussed as a strength of the research overall. Looking at the same aspects from these dual perspectives adds new insights such as the differences in emphasis between students and mentors on clinical and academic learning (discussed in Chapter 3) and similarities in views about the infection prevention and control nurse.

Our new knowledge of some of the barriers to reporting poor practice perceived by nursing students should enable both universities and clinical placements to make the reporting process easier and to support students in reporting poor practice. I have identified how students make judgements about good and inappropriate practice; this will enable educationalists to focus their attention on the aspects which seem to influence students more in infection prevention and control, such as what the university teaches them. The research findings should also encourage universities and clinical areas to work together to ensure that students are exposed to evidence-based practice, supported by theory and clinical expertise in both settings using the same evidence. This would ensure a consistent and clear message about good practice and reduce confusion among students about conflicting practices.

5.2 Limitations
There are some limitations to both the research undertaken and the published papers which need to be acknowledged. Some of these have been alluded to in earlier chapters but I feel it to be appropriate to discuss them collectively in this chapter.
The involvement of students from only one university and mentors from one NHS Trust needs to be highlighted as a significant weakness which may affect the generalizability of the findings. The research took place in a large university with an annual intake of approximately 400 nursing and 70 midwifery students, and which uses a wide variety of organisations for clinical placements. The extent to which these findings can be generalized to other institutions could be questioned. While the rigour of the research has been considered in Chapter 2 and many issues were addressed during the research process, the narrow ‘pool’ from which participants were drawn could be seen as adversely affecting the utility of the research outside of the local population used. Despite this, the population from which the sample was drawn met the aims and objectives of the research overall. The setting including the clinical and educational context of the studies has been described in sufficient detail for any readers of the papers or this thesis to judge whether the findings have meaning in similar or related situations and it is clear that the research findings can act as a catalyst for consideration of the issues highlighted in other educational establishments providing pre-registration programmes for nursing and midwifery.

Paper 1 used traditional rather than systematic approaches to reviewing the literature. With hindsight the latter approach would have been more appropriate and, had I considered the paper’s use for a PhD in the future, I would have elected to undertaken the more systematic approach. Paper 1 therefore needs to be considered within its limits as a review of the literature and be judged by its readers within these limits. However, I have been unable to identify any later systematic review of the same subject matter. Additional research papers have been published on the topic since this literature review but these do not change the conclusions reached within it. It therefore still makes a contribution to the body of knowledge in the role of education in infection prevention and control.

Another significant weakness is the fact that the students interviewed had all been taught about infection prevention and control at the university, the majority of them by myself, which may have limited their willingness to comment negatively on the education provided. It has been argued that interviewees are vulnerable during research and that researchers bring and exercise power to and in interviews (Sinding and Aronson 2003) and therefore steps need to be taken during the interview process to
minimise the vulnerability that interviewees, in this case students, feel and to minimise the impact of the role conflict in this case. It was made clear to student participants both verbally and in the participant information sheet that there would be no benefits or disadvantages to either participating or not in the research. Students were also given the opportunity to check their transcripts prior to analysis to identify anything that they regretted saying and wanted removing from the transcripts. It was also made clear that I was acting in the role of researcher during the interview process, rather than infection control lecturer. However, at times this was an issue as students would ask infection prevention control questions during the interviews to validate their own choices or opinions. In these cases, students were redirected to the interview process and were advised to ask such questions after the interview had been completed, which is then what occurred. I did experience some difficulties myself in not answering queries during the interview but endeavoured to keep myself within interviewer role. I do consider, however, that there might be benefits to knowing the interviewer in terms of feeling comfortable to talk about some issues and it might therefore be the case that students felt happier to talk about infection prevention and control issues with someone who they felt understood what they were highlighting due to my role as a lecturer in infection prevention and control and nursing.

5.3 Strengths

I consider there to be several strengths within the research undertaken. The use of both students and mentors in the same research was a real strength as it enabled data source triangulation. This has been said to enhance validity in qualitative research (King and Horrocks 2010) but there is disagreement regarding this in the literature. For example, while data triangulation, that is using more than one data source within the same data collection approach, can assist in avoiding the limitations of collecting the data using just one approach (interviewing in this research), it has been doubted that perspectives from different sources in the same study can really be integrated (Mays and Pope 2000). It is therefore suggested by King and Horrocks (2010) that triangulation be seen as valuable in making a study more comprehensive and in stimulating reflexivity in the interviewer. I consider the use of both students and mentors within the research to be a way of triangulating data and see the inherent improvement in comprehensiveness to be a strength of the research.
A further strength was my lack of any previous relationship with the mentors interviewed as this meant that there was no role conflict. This ensured that there were no role distractions during the interview process. I do acknowledge, however, that there may be some benefits to knowing participants in terms of their level of comfort in talking about issues which may have been impeded when dealing with mentors. There was, however, no power effect due to infection prevention and control knowledge as mentors only knew me as someone from the university who had come to interview them. In many cases, the mentors saw themselves as being superior to me in terms of clinical knowledge and application as they had more recent clinical experience and, in some cases, felt that their infection prevention control knowledge was more up to date than that of a member of university staff.

The use of Framework Analysis as a data analysis approach for interview transcripts provided a systematic and rigorous approach. Paper 8 discusses the use of Framework Analysis in the research and identifies advantages to its use, but in summary these include the provision of transparent results; the production of conclusions that can be related back to the original data; an auditable decision trail which improves dependability; flexibility in that it can be utilised both during and after data collection and the fact that it can be used by multiple staff on the same research team, by both novices and experts.

5.4 Areas for future research
Several areas for future research emerge both from the research undertaken and the papers published. These were identified within the papers but were not posed as research questions.

There is a question which arises from the findings relating to the infection prevention and control nurse; What leadership training, if any, do these nurses receive and, for those who do receive it, what difference does it make or what impact does it have? This could be approached through using a variety of different study designs and methods. For example, one could apply an experimental design such as a randomised controlled trial to test the effect of exposure to leadership training on the effectiveness of individuals in that role. Alternatively, a weaker design (in terms of attributing cause and effect), but one that is easier to execute would be an uncontrolled before and after design in which an initial questionnaire would assess knowledge and other aspects of
role competence prior to and after exposure to training. Possible the weakest approach would be to undertake a survey of both infection prevention and control nurses and staff that they interact with to find out about the perceived benefits of any education and training received and any perceived gaps.

Considering that one of the weaknesses identified within the research was the undertaking of a literature review as opposed to a systematic review I recommend that a systematic review be undertaken in this area to ensure that any conclusions reached by myself within the initial review are valid. A more rigorous systematic review to determine whether education has an impact on both practice in infection prevention and control and on rates of infection, particularly in the long-term, would be of value. Such a review would need to explore the evidence for the effectiveness of different educational approaches and would also identify and prioritise future research.

Several areas for future study lead from the attitude findings. Both mentors and students within the research identified that attitudes in students might be changed by exposure to clinical staff in practice and that, at times, students amend what they know to be good practice in order to ‘fit in’ within their current clinical placement. It is therefore worth considering the following question: how do measured attitude scores of student nurses towards infection prevention and control change after a clinical placement? These clinical placements could be in both the acute and primary care setting. The initial attitudes of students might have been affected by university information and then again impacted on by their placements. Answering this question using a longitudinal design utilising an attitude scoring system before and after each placement would be valuable in assessing any positive or negative impact and how this could be used or addressed to improve attitudes and, as a consequence, practice. While there has been research linking negative attitudes to sub-optimal practices in infection prevention and control, it might also be worth considering, as part of this research question, whether this is the case in nursing students in relation to measured scores and assessed practices. The attitude scores could be of either the Likert type which has high reliability and is easy to construct but has a lack of reproducibility and poor demonstration of validity; or a semantic differential (Osgood et al 1957) which is also simple to construct, is easy for subjects to complete and allows for several types of analysis, though this analysis can be difficult (Payne and Payne 2004).
Also in relation to attitudes, a question that arises is; *What factors influence nurses’ attitudes towards infection prevention and control?* This could be answered using a mixed methods approach utilising an attitude score as above and interviews to assess the factors affecting attitudes. This would highlight the issues which need to be addressed to improve attitudes and therefore infection prevention and control practices.

While previous literature has considered the value of audit in terms of changes in practice and quality initiatives (Bowie et al 2012), and processes related to audit feedback have been evaluated (Bowie et al 2009), there is little to support the study participants’ views that unannounced audits are more indicative of practice than those which are announced in advance. In both cases, staff are generally aware at the time of audit that they are being audited and the effects of this are similar to those in observational research in terms of the Hawthorne effect, particularly in relation to hand hygiene (Kohli et al 2009, Eckmanns et al 2006). Though it seemed obvious to students that there would be differences in audit findings if staff knew of the audit in advance, research needs to be undertaken to prove any differences. This could involve an experimental design utilising a randomised controlled trial and would assist in justifying future audit strategies in infection prevention and control.

From the earlier contribution to new knowledge of acceptance of barriers to good practice and therefore sub-optimal practice as the ‘norm’, a further research question emerges; *What factors influence nurses’ and midwives’ reporting of barriers to effective practice in infection prevention and control?* This could be addressed through a survey design or qualitative interviewing which would enable identification of factors which nurses and midwives perceive to inhibit their ability to report clinical practice issues in relation to infection prevention and control.

5.5 Conclusion

From the research undertaken and the papers published I feel that I have advanced the knowledge available in relation to the infection prevention and control education of nursing students, and particularly midwifery students, in both the university and clinical practice settings. Through justification of the methodological approach and creation of a conceptual framework for the research, this thesis has provided a cohesive account of the studies on which the publications are based. While there are some weaknesses within both the studies and the papers, there are several strengths and the thesis does
contribute further by suggesting research questions which need to be answered by future study.

From a personal perspective, undertaking this PhD thesis has enabled me to consider both my research and my publications as a cohesive body of work. I have been able to analyse the work undertaken and highlight the impact that it could have on future practice, both in education and in infection prevention and control.
Paper 1

The role of education in the prevention and control of infection: A review of the literature

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Introduction

Healthcare associated infections (HCAIs) have a massive impact on health services and patients, costing the NHS an estimated one billion pounds annually (Plowman et al., 1999) and having additional costs to reputation, staff workload and the health of patients. The Health and Social Care Act 2008 (Department of Health, 2009) stipulates that systems for the prevention and control of HCAI should address education and training of health care staff. This is the latest in a chain of publications related to infection prevention and control which have been published by the National Audit Office (2000, 2004, 2009) and the Department of Health in England (2002, 2003, 2004, 2006). Many of these documents have identified education as an important aspect in the prevention and control of HCAI. In other parts of the United Kingdom (UK), the Welsh Assembly Government has published a strategy which identifies education as an important aspect in reducing HCAI (WAG, 2004) and in Scotland, the Welsh Assembly Government has published a strategy which identifies education as vital in reducing HCAI (WAG, 2004) and in Scotland, a quality assurance framework has been produced for education related to HCAI (NHS Education for Scotland, 2005). The Department of Health, Social Services and Public Safety (DHSSPS, 2006) also produced a strategy for the prevention and control of HCAI in Northern Ireland which referred to education. Outside of the UK, Australia’s government published guidelines for infection control in 2004 (Australian Government, 2004) which referred to education and the US Department of Health and Human Services (2009) has published an action plan to prevent HCAI which states that the education of best practices for providers and other healthcare personnel is critical to prevent HCAI. It is clear then that infection prevention and control is seen as an important aspect of healthcare across the world and that education has been identified as having a vital role to play in preventing and controlling HCAI.

This review of the literature was carried out in order to inform a study into infection control education for student nurses and midwives in both the university and practice settings. The following databases were used to identify and locate the literature available on infection control education: Cinahl, Medline, and the British Nursing Index. The following inclusion criteria were applied:

1. Published between 1995 and 2009
2. English language
3. Specific to nursing or midwifery
4. Focus specifically on education in infection control
5. Research based papers (no opinion papers included)

The review overall aimed to answer the following questions:

1. Does education improve infection control practices in both the short and long-term?
2. Does education reduce rates of infection and if so, is the reduction sustained?
3. What teaching approaches are the most effective in improving knowledge of infection control and what approaches are preferred by nurses and midwives?
### Table 1
Summary of studies included in review.

<table>
<thead>
<tr>
<th>Reference and location</th>
<th>Design and sample</th>
<th>Setting</th>
<th>Key findings</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andersen et al. (2005) Australia</td>
<td>Prospective study in one hospital, 174 infants over a 12 month period</td>
<td>Neonatal</td>
<td>There was a reduction in BSI rates</td>
<td>Small sample and single centre intervention not randomised. Adherence to all of interventions not assessed.</td>
</tr>
<tr>
<td>Aragon et al. (2005) US</td>
<td>Observation and surveillance</td>
<td>All healthcare areas in one organisation</td>
<td>There was a one year long improvement in hand hygiene compliance and isolation precautions (measured at 6 and 12 months, slight decrease between these times)</td>
<td>Increase in compliance not as high as anticipated prior to interventions.</td>
</tr>
<tr>
<td>Atack and Luke (2008) Canada</td>
<td>Quasi-experimental pre- and post-test study, convenience sample of 76 including nurses</td>
<td>4 hospitals</td>
<td>There were statistically significant increases in perceptions of competency after education</td>
<td>No evidence to suggest this perception translates into practice. Convenience sample reduces generalisability of results.</td>
</tr>
<tr>
<td>Berg et al. (1995) Guatemalan City</td>
<td>Pre- and post-intervention surveillance</td>
<td>ICU</td>
<td>Decrease in nosocomial pneumonia after interventions</td>
<td>Multiple interventions including education, no adjustment for other factors which could have impacted on results. Evaluation of one method only — no comparisons with other methods.</td>
</tr>
<tr>
<td>Brye et al. (2008) Canada</td>
<td>Survey (280), observation (117) and interviews (50) nurses</td>
<td>1 Health authority</td>
<td>Users of the e-learning package found it relevant and simple to use, observation of PPE use demonstrated effective transfer of knowledge, staff interviewed saw the package as a sign of management commitment. There are differences in training needs between disciplines and individuals</td>
<td>Small sample size and education needs identified by respondents so are perceived rather than actual.</td>
</tr>
<tr>
<td>Bush et al. (2005) USA</td>
<td>Pilot needs assessment 23 health care professionals including nurses — web based survey</td>
<td>Variety across all hospital settings</td>
<td>Combining training and restrictions in antibiotic prescribing can reduce colonisation and infection with antibiotic-resistant micro-organisms</td>
<td>Combination of strategies means the impact of individual interventions cannot be measured.</td>
</tr>
<tr>
<td>Calil et al. (2001) USA</td>
<td>4 phase study including cross-sectional and longitudinal designs</td>
<td>Neonatal unit</td>
<td>Teaching methods increased student knowledge but flipchart was preferred over video as an AVA</td>
<td>Testing instrument has low reliability. The 2 teaching methods were delivered to different group sizes which may impact on the findings.</td>
</tr>
<tr>
<td>Canizas et al. (2007) El Salvador</td>
<td>Pre- and post-intervention MCQ tests, 67 nurses</td>
<td>Paediatric hospital</td>
<td>The use of a correct hand washing technique increased after intervention</td>
<td>Not observed in the long-term compliance was still low post-intervention.</td>
</tr>
<tr>
<td>Cheng et al. (2008) Canada</td>
<td>Survey nurses</td>
<td>ICU</td>
<td>Compliance with hand hygiene can be improved by education</td>
<td>No data in the long-term. Other professionals used alcohol hand rub so this affected overall measured use when only nurses were considered.</td>
</tr>
<tr>
<td>Coignard et al. (1998a,b)</td>
<td>Pre- and post-intervention study</td>
<td>ICU</td>
<td>The use of a correct hand washing technique increased after intervention</td>
<td>Not observed in the long-term. Not every nursing action may require use of alcohol handrub so compliance estimate may be inaccurate due to measuring tool.</td>
</tr>
<tr>
<td>Colombo et al. (2002) Zurich</td>
<td>Pre- and post-intervention study</td>
<td>6 surgical and 4 medical wards, ICU</td>
<td>The 2 teaching methods were delivered to different group sizes which may impact on the findings.</td>
<td>Small sample size.</td>
</tr>
<tr>
<td>Cooper (2004) UK</td>
<td>Action research, 14 staff (majority nurses) in one NHS trust</td>
<td>Medicine and surgery</td>
<td>Hand hygiene audit standards can be significantly improved by the education of link nurses</td>
<td>Use of action research. 1 trust — I lack of generalisability to other link nurse systems.</td>
</tr>
<tr>
<td>Coopersmith et al. (2002) USA</td>
<td>Pre- and post-intervention observational study, 4283 patients</td>
<td>ICU</td>
<td>Infection rates and related costs reduced after an educational intervention</td>
<td>Staff were aware of study which may have affected behaviour and surveillance feedback data was also provided.</td>
</tr>
<tr>
<td>Curnlow and Wharrad (2007) UK</td>
<td>Nurse evaluation 12 nurses-questionnaire</td>
<td>One hospital</td>
<td>CAL is an enjoyable and acceptable method of delivering hand hygiene updates</td>
<td>Very small sample size.</td>
</tr>
<tr>
<td>Desai et al. (2000) UK</td>
<td>Quantitative evaluation Nurses, medical students and infection control personnel 48 staff participated-questionnaire and MCQ exam</td>
<td>One hospital</td>
<td>As much knowledge can be gained by CAL as by lectures. CAL is more convenient to access.</td>
<td>Small sample size.</td>
</tr>
<tr>
<td>Dorsey et al. (1996) US</td>
<td>Prospective observational before and after study</td>
<td>Emergency department</td>
<td>Handwashing compliance was not significantly improved by education</td>
<td>Staff were aware of observation. Educational interventions included posters and distribution of a publication only—no monitoring of whether staff actually read these.</td>
</tr>
<tr>
<td>Gould and Chamberlain (1997) UK</td>
<td>Quasi-experimental Nurses (n = 31) observational schedule and MCQ exam</td>
<td>Surgical wards</td>
<td>There were no differences in performance between nurses who had received education and those who had not.</td>
<td>Small sample size. Practical difficulties with intervention — not all staff could attend etc.</td>
</tr>
</tbody>
</table>
Table 1 continued

<table>
<thead>
<tr>
<th>Reference and location</th>
<th>Design and sample</th>
<th>Setting</th>
<th>Key findings</th>
<th>Comments</th>
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<tr>
<td>Khatib et al. (1999) Beirut</td>
<td>Covert observation post-intervention</td>
<td>ICU</td>
<td>There was a more significant increase in hand hygiene after the use of warning labels than after education. In the 4 week period after education, hand hygiene and glove use declined, this did not occur in the 4 weeks after warning labels were introduced</td>
<td>No baseline information collected prior to either intervention, no information in long-term, education was a one-off intervention whereas warning labels were present through full 4 week study period</td>
</tr>
<tr>
<td>Lam et al. (2004) China</td>
<td>Post-intervention for 4 weeks after education then 4 weeks after warning label use Pre- and post-intervention observational study 301 hours of observation</td>
<td>NICU</td>
<td>There was an improvement in hand washing technique and infection rates reduced for 6 month period</td>
<td>Multiple interventions in programme so unable to identify effect of individual strategies Effect of behaviour of observer</td>
</tr>
<tr>
<td>Larson et al. (1997) US</td>
<td>Before and after study Tertiary care health centre</td>
<td></td>
<td>There were minimal long-term effects related to an intervention including feedback, education and facility amendments within 2 months after the intervention</td>
<td>Multiple interventions so unable to assess impact of education individually</td>
</tr>
<tr>
<td>Lee et al. (2009) Canada</td>
<td>Before and after study Whole hospital</td>
<td></td>
<td>Rates of infection decreased after a 3 month education programme</td>
<td>No long-term measurement of infection rates following intervention SARS outbreak also contributed to reduction in rates of MRSA infection</td>
</tr>
<tr>
<td>Lobo et al. (2005) Brazil</td>
<td>Infection surveillance pre- and post-intervention</td>
<td>ICU</td>
<td>Programme resulted in reductions in CRBSI—remained the same after a year so no further reductions and rates remain high</td>
<td>Education combined with policy changes so unable to assess individual impact of education</td>
</tr>
<tr>
<td>Makris et al. (2000) US</td>
<td>Infection control surveillance system,</td>
<td>8 Long-term care facilities</td>
<td>A comprehensive programme may reduce infection rates</td>
<td>Multiple interventions so not possible to evaluate the impact of individual strategies Small-scale study so results were not statistically significant</td>
</tr>
<tr>
<td>Mikkelsen et al. (2007) Norway</td>
<td>Comparative study of 3 teaching methods using focus groups</td>
<td>School of nursing</td>
<td>Scenario-based simulation made student nurses more aware of the complexity of patient scenarios</td>
<td>Small number of study groups Only 21 students involved in focus groups</td>
</tr>
<tr>
<td>Nichols and Badger (2008) UK</td>
<td>Participant observation and semi-structured interviews</td>
<td>Renal unit</td>
<td>Gap between espoused and actual compliance. Tacit knowledge may offer a way of gaining and implementing knowledge</td>
<td>Interview sample size unclear</td>
</tr>
<tr>
<td>Panhotra et al. (2004) Saudi Arabia</td>
<td>Prospective, observation</td>
<td>ICU</td>
<td>Education increased hand washing in nurses but not doctors.</td>
<td>Education programme was continuous rather than a once only intervention as in other studies Observation was not covert which may have impacted on compliance</td>
</tr>
<tr>
<td>Perkins et al. (2009) San Diego</td>
<td>Before and after study Telemetry unit</td>
<td></td>
<td>There was an increase in compliance with ICPs and a reduction in MRSA acquisition throughout the 6 month study period</td>
<td>No data in the long-term</td>
</tr>
<tr>
<td>Pessoa-Silva et al. (2007) Geneva</td>
<td>Intervention study Neonatal Unit</td>
<td></td>
<td>Compliance improved for the 9 month follow-up period, decreases in some bacteraemias</td>
<td>Multi-faceted education programme so unable to evaluate effectiveness of different aspects of programme Not randomised No systematic monitoring of practice post-intervention</td>
</tr>
<tr>
<td>Reime et al. (2008) Norway</td>
<td>Comparative trial of 2 teaching approaches evaluated by MCQ (141 students)</td>
<td>Nursing school</td>
<td>E-learning and lectures are equally effective in improving knowledge</td>
<td>Did not follow-up to test retention of knowledge</td>
</tr>
<tr>
<td>Roberts et al. (2008) UK</td>
<td>Qualitative experimental design</td>
<td>15 Nursing homes</td>
<td>There were no statistically significant differences between applying an intervention plus education and applying it without</td>
<td>Small number of organisations involved, raised queries about the educational approach used for the study</td>
</tr>
<tr>
<td>Rosenthal et al. (2003) Argentina</td>
<td>Prospective before and after trial 1219 IVD days Intervention study</td>
<td>ICU</td>
<td>Rates of IV device related infection decreased after education.</td>
<td>No data on longer term rates Additional hand hygiene programme pre-education which may have affected outcomes</td>
</tr>
<tr>
<td>Santana et al. (2008) Brazil</td>
<td></td>
<td></td>
<td>There was a significant increase in knowledge after education but no significant reduction in incidence of catheter-related bloodstream infections</td>
<td></td>
</tr>
<tr>
<td>Schelenz et al. (2005) UK</td>
<td>Retrospective analysis of computerised data</td>
<td>Cardiothoracic</td>
<td>There were falls in patients acquiring MRSA in hospital and in MRSA bacteraemias following an enhanced programme</td>
<td>Multiple interventions in programme so unable to identify effect of individual strategies</td>
</tr>
<tr>
<td>Schlomka et al. (2006) USA</td>
<td>Single centre interventional study</td>
<td>NICU</td>
<td>Nosocomial infection rates were reduced following introduction of a programme — sustained for 3 years</td>
<td>Multiple interventions in programme so unable to identify effect of individual strategies</td>
</tr>
<tr>
<td>Trick et al. (2007) US</td>
<td>Prospective interventional study over 3 years</td>
<td></td>
<td>There was increased adherence to hand hygiene and glove use recommendations at the intervention hospitals</td>
<td></td>
</tr>
<tr>
<td>West et al. (2006) Scotland</td>
<td>Questionnaire surveys and interviews, healthcare staff including nurses (773 students, 155 nurses)</td>
<td>All-national study</td>
<td>Positive experiences reported by staff on national education programme</td>
<td></td>
</tr>
<tr>
<td>Wisniewski et al. (2007) US</td>
<td>Survey of 4345 health care workers 3 times over 5 years</td>
<td></td>
<td>The preference for the use of alcohol hand rub for hand hygiene increased in relation to attendance at an interactive education session</td>
<td>Unclear whether this is a positive outcome as alcohol hand rub cannot totally replace hand washing.</td>
</tr>
</tbody>
</table>
An overview of selected papers

A total of 39 studies were included in the review. The majority of the studies were conducted in the UK (n = 9) or the USA (n = 10) while others originated from a range of other areas including Asia (n = 3), South America (n = 5), Europe (n = 4) and Canada (n = 4). Most were quantitative studies utilising pre- and post-interventional, quasi-experimental and comparative trial designs. Samples ranged from 12 nurses to multiple sites. The majority of studies were undertaken in an intensive/critical care or paediatric/neonatal setting, with others taking place in long-term care facilities, medicine and surgery, cardiothoracic, telemetry, renal medicine and schools of nursing (see Table 1).

From this search, three major themes emerged: the role of education in improving practice; the role of education in reducing infection and teaching and learning in infection control.

The role of education in improving practice (in the short and long-term)

It would seem important to consider whether the education of healthcare staff can improve infection control practices as it has previously been demonstrated that increased compliance with precautions such as hand hygiene can reduce rates of infection (Ryan et al., 2001; Fendler et al., 2002).

Colombo et al. (2002) reported that compliance with hand hygiene could be improved by targeted teaching. This study combined teaching with supportive structural improvements and it was therefore not possible to identify the actual role of education in any practice improvements. Though this study was based on an intervention and there was a control group, compliance with the use of alcohol hand rub improved in the control group as well as in the intervention group. The group receiving education did demonstrate a higher level of use of alcohol handrub, except in one area and there was no identified reason for this. It was unclear whether there would be a sustained improvement over time as this was demonstrated in some wards but not others. The method of assessing compliance with hand decontamination was also an area for question as it was based on the amount of alcohol handrub used and a computerised daily assessment of nursing activities rather than observation of actual activities. One limitation in this approach is that other staff members used the alcohol handrub so it is likely that there was an overestimation of handrub use. This is acknowledged by the authors. There was further acknowledgement that not all nursing activities require the use of alcohol handrub.

Lam et al. (2004) reported that an intervention programme improved hand washing practice and reduced rates of infection which was sustained 12 months after the intervention. This observational study, in line with others, combined education with several other activities and so it is still unclear whether education impacts on practice. In comparison with these findings, Larson et al. (1997), based on a prospective quasi-experimental study, found that despite infection control practice improving following multiple interventions including education, practice had returned to the initial baseline level by the 2 month follow-up stage. Perkins et al. (2009) also combined interventions, including education, and reported an increase in compliance with infection control precautions and a reduction in MRSA infections. As data was only recorded over the 6 months of the study period, there is again no evidence of any long-term effects on practice.

Trick et al.’s (2007) prospective observational study was undertaken over a 3 year period. The intervention included education, the introduction of alcohol hand rub and a poster campaign. The authors reported that there was increased adherence to hand hygiene recommendations in the 3 intervention sites when compared with the control site which did not participate in the education or poster campaign. There is some evidence here that educational interventions, including the use of posters, can have a positive impact on practice. The site with the greatest increase in hand hygiene compliance also demonstrated a reduction in incidence of antibiotic-resistant bacteria which strengthens the argument that improved practice can reduce infection rates.

There were specific research studies which investigated the role of education alone in changing infection control practices. Panhotra et al. (2004), for example, reported that education increased compliance with hand hygiene in nurses as measured by observation. The fact that education was provided continuously rather than episodically as in other studies may have impacted on the findings. The use of non-covert observation of practice in this study may also have changed practice (Polit et al., 2005). Pessoa-Silva et al. (2007) later reported that compliance with hand hygiene improved and rates of bacteremias decreased in neonates following an educational intervention programme. This improvement had been sustained 9 months later. However, the improvement was gradual across study phases. In addition, the findings of this study are affected by the fact that there was no randomisation within the study and practice was not systematically monitored after the intervention.

Attack and Luke (2008) carried out a quasi-experimental study involving 76 health care professionals including nurses. They reported that education via an online course increased staff’s perceptions of their own infection control competence though this perception does not necessarily equate to improved practice as a result of education. Their use of a convenience sample may also affect the generalisability of their results (Parahoo, 2006). Dorsey et al. (1996) had earlier also reported that ‘teaching’ did not significantly improve hand hygiene in an emergency department. The fact that the ‘teaching’ intervention comprised of posters and distribution of a publication and no actual formal teaching may be a factor in these results. Despite staff knowing that they were being observed, though they did not know the purpose of the observation, hand hygiene practice did not improve in any significant way.

The lack of evidence for long-term effects on practice of education is supported by other studies. Coidnard et al. (1998a,b) combined hand hygiene training sessions with demonstrations, posters and articles in a newsletter to demonstrate an increase in the number of staff who could decontaminate their hands correctly. There was no follow-up beyond 2 weeks post-intervention and the improvement in hand washing technique, though significant, still led to less than 20% of staff decontaminating their hands correctly. This suggests possible difficulties in areas such as the type of education used or the application of the
hand washing technique deemed to be correct. Khatib et al. (1999) further studied the effect of education on hand washing in intensive care and while there was an initial improvement in practice, this had returned to baseline levels within 3 weeks post-intervention.

The introduction of infection control link nurses (Horton, 1988) has led to challenges in the education of such nurses. Cooper (2004) implemented and evaluated a flexible teaching approach to the education of link nurses using action research and reported significant improvements in specific audit standards relating to hand hygiene. Unfortunately, the data related to improvements was not available in the long-term. In addition, there were several limitations to the study including its small sample size of 14 staff who completed the whole research project in one NHS trust and the unpredictability of action research (Herr and Anderson, 2005). This type of research often involves researchers in multiple tasks and several roles and therefore requires a time commitment and close supervision of decision making. Cooper (2004) acknowledges that there were competing demands for both supporting the research and managing the usual workload of infection control staff which impacted on the time available for the research.

When considering the value of differing interventions in improving specific infection control practices, Gould et al.’s (2007) systematic review led to a stark conclusion: there is not enough evidence to be certain about what strategies improve compliance with hand hygiene, the most important intervention in the control of cross-infection (Damani and Emmerson, 2003). From the literature there is therefore currently no clear evidence that education has a sustained positive effect on compliance with infection control precautions.

The effect of education on rates of infection (In the short and long-term)

Recent targets and surveillance strategies for micro-organisms such as Clostridium difficile and meticillin resistant Staphylococcus aureus (MRSA) bacteraemias (DH, 2005, 2008) and the greater emphasis on publishing infection rates has led to an increased focus on ways of reducing infection. Education has been considered in the literature with regards to its possible impact on particular infections. Schelenz et al. (2005) reported on an enhanced infection control programme which was introduced into a London hospital. Following introduction of the programme there were significant reductions in the proportion of patients acquiring MRSA in the hospital and in the rate of MRSA bacteraemias. While the programme included education, it combined this with several other strategies and it is not possible to identify education as the main factor in the reduction of MRSA infections. It is, in fact, not possible to determine whether education alone would have had any impact at all or if it is the combination of other activities which affects infection rates. In Lee et al.’s study (2009), which also considered the impact of an education programme on rates of MRSA infection, there were reduced rates following the 3 month programme which was not combined with other interventions. The programme did not have any impact on hand hygiene practice despite this reduction in the rate of MRSA infection and there was no follow-up to assess the long-term impact of the programme. There was also a SARS outbreak immediately prior to the educational intervention which had the effect or reducing the rate of MRSA infections.

In the United States, Makris et al. (2002) had earlier investigated the impact of a comprehensive programme on infections in long-term care facilities. Infection data was collected pre- and post-intervention. Infection rates in the intervention sites were reduced while in the control sites rates increased. As with the previously mentioned study from Schelenz et al. (2005), education was combined with other strategies such as enhanced cleaning and the use of different decontamination agents. It is again unclear from this study whether there is a direct link between education and rates of infection.

Rosenthal et al. (2003) reported on the impact of interventions on intravenous device related bacteraemias in Argentina, using a prospective before and after trial. Although education and performance feedback were used as interventions, these were implemented sequentially, education first, and it was therefore possible to identify the impact of education alone. There was a significant reduction in infections following education ($p = 0.0026$). However, as with other studies, there is no information on the rates of infection in the long-term relating to this study. A hand hygiene programme which was introduced prior to the intervention may also have had an impact on infection rates, a possibility acknowledged by the authors of the study. Effects on intravenous device related bacteraemias were also investigated by Cali et al. (2001) who reported a reduction in colonisation. A factor which may have had a significant impact on the overall results of this study is that education was combined with restrictions on cephalosporin use.

When considering nosocomial infection rates in neonates, Schlonka et al. (2006) found that comprehensive infection control measures could reduce bacterial and fungal infection rates. In this case, the effects have been sustained for 3 years. The fact that one of the interventions utilised alongside education was the introduction of a specialist nursing team for central venous and arterial catheter care is an important factor as there is evidence that the introduction of dedicated intravenous therapy teams can have a significant impact on rates of infection (Soifer et al., 1998). In the same patient group, Andersen et al. (2005) had earlier identified that an infection prevention strategy led to a reduction in nosocomial bloodstream infections. Again, education was combined with other strategies such as changes in antiseptic solutions for both hand hygiene and skin preparation and standardisation of intravenous devices. Adherence to all of the interventions within the strategy was also not monitored and the intervention was not randomised. As with the previous literature discussed in relation to the long-term impact of education on practice, Aragon et al. (2005) reported similar findings in relation to impact on infection rates. Although their performance improvement process initially demonstrated a decrease in infections caused by antibiotic-resistant organisms, the incidence of such infections had increased within the first year post-intervention. The authors did, though, report that compliance with hand hygiene improved, though not by as much as they had anticipated.

Coopersmith et al. (2002) carried out a pre- and post-intervention observational study where the intervention consisted of a self study module and verbal in-service training. It was reported that primary bloodstream infections fell post-intervention. It is unclear whether there was any adjustment within the methodology for other factors which may affect infection rates and, as with Rosenthal et al.’s (2003) study there was no indication of whether this reduction in infection rates was sustained in the long-term. Staff participating in the study were additionally aware and were therefore not blinded to the study. This may have affected behaviour. The feedback of surveillance data in this study may also have affected the outcome as it has been demonstrated that feedback of surveillance data can improve practice and reduce infection rates (Wilson et al., 2006, Konishi et al., 2006). In a similar study (Won et al. 2004), feedback was combined with education and other interventions, including financial incentives which resulted in a demonstrable reduction in respiratory tract infections related to an increase in hand hygiene compliance. A reduction in pneumonia was also earlier reported by Berg et al. (1995) but again this was related to a combination of interventions which included education and there was no long-term data available.

The main focus of many of these studies is the premise that education increases knowledge which in turn improves practice and leads to reduced levels of infection. Despite this, Santana et al. (2008) reported that, while an educational intervention study on 2 intensive care units led to a significant increase in knowledge, there was no significant reduction in catheter-related blood stream infections.
related to this. It would appear from this study that while education can increase knowledge, this increase in knowledge does not necessarily lead to improvements in rates of infection.

From the literature discussed it is unclear whether education alone can have a significant and sustained effect on rates of infection, whether it needs to be combined with other interventions or even if education has any role to play at all. This was further emphasised by Roberts et al. (2009) who found that education did not produce statistically significant differences in rates of infection when added to another intervention in comparison with the other intervention alone. In fact, it was reported that infection rates actually fell in the site without educational input. This study was carried out in the nursing home settings and it is unclear whether such a setting would impact on the results in comparison with an acute hospital setting.

Teaching and learning in infection control

There is minimal literature around the education of student nurses or midwives in practice with regards to infection control. Wu et al. (2009) performed a cross-sectional survey of student nurses and reported that student nurses had low levels of knowledge regarding standard infection control precautions. The ability of students to apply infection control precautions in practice was also inadequate. These findings could indicate a need for a more comprehensive education programme for student nurses which clearly links theory with practice. The study was carried out in Taiwan and is therefore not necessarily an indication of such an issue in other areas of the world and the lack of research available in this area leads to difficulties in determining any differences and similarities between different countries. Nichols and Badger (2008) reported on a study which investigated the sources of knowledge used by nurses to underpin their clinical infection control practices. This study combined interviews and observation. The authors reported that there was a clear preference for learning in practice as opposed to from more formal sources. There was also an indication of tacit learning being used to underpin good practice, though when tacit learning was not congruent with the usual standards of good practice, such learning could contribute to poor practice.

The limited literature in this area highlights the need for further research around infection control education in practice.

Teaching and learning methods in all areas of practice have changed over time with a move from the traditional didactic methods to more interactive approaches (Quinn and Hughes, 2007). The importance of educational approaches in increasing knowledge has been highlighted in the literature (Beers and Bowden, 2005, Walker et al., 2007). This has affected nurse education (Chaffin and Maddux, 2004). The use of computer assisted learning (CAL) in infection control education has been evaluated in the literature. Columbine and Wharrad (2007) trialled a CAL package about hand hygiene. Nurses found the package enjoyable to use. The small sample of only 12 nurses trialling the package and no indication of the effectiveness of the package in increasing knowledge or improving practice within the paper may affect the usefulness of the findings. Desai et al. (2000) had earlier assessed a CAL package over an 18 month period and reported that some staff gained as much knowledge from the CAL package as they did from lectures. The authors further concluded that the use of CAL is more convenient as a learning resource than other more formal educational approaches as staff can use CAL at their own pace and within their own time.

Bush et al. (2005) considered educational strategies for both student and qualified health care professionals and found that one educational approach alone does not meet the needs of all staff. This finding was based on a pilot needs assessment to identify the theory-practice gaps and training needs perceived by staff.

The limited research in this area has identified educational strategies which staff find appropriate and which increase staff knowledge as demonstrated by examination. However, it has to be questioned whether an increase in knowledge improves practice considering the literature reviewed in previous themes.

Discussion

This review aimed to identify the literature around infection control education, specifically in nursing and midwifery. The reasons for conducting the review are related to international recommendations identifying education as an important aspect of infection
prevention and control programmes. Despite this international focus, however, the review suggests that there is a lack of robust evidence of the efficacy of education in improving practice and reducing rates of infection, particularly in the long-term. There is also minimal literature available about the education of student nurses and midwives, though there is more evidence relating to staff preferences for methods of education in infection control. However, these preferences do not necessarily reflect the best approaches for learning. It has also become clear that while education may increase knowledge, this does not necessarily equate to an improvement in practice.

It would appear problematic to isolate education as the only intervention in some studies about compliance and infection rates but this may be understandable given the complexities inherent in studies based in practice settings (Mateo and Kirchoff, 1999) where the care and treatment of patients is paramount and ethical implications must be considered. While work in a purely educational setting could identify the effects of education on facets such as knowledge and skills, in practice settings there are multiple variables which can impact on both practice and on outcomes such as infection including workload, skill mix, staff risk perception, time pressures and facilities available for staff to use (Earl et al., 2001, Cohen et al., 2002). Adjusting for these factors in order to identify the actual impact of education alone may be a difficult undertaking. In controlled trials other variables can be isolated but ethical considerations may prove difficult to overcome when we may be considering depriving patients or staff of what is already considered to be good practice. However, given that practices are increasingly meant to be evidence-based, we may also be placing reliance on education when it may not achieve what it is considered to achieve. While the research has suggested that education increases knowledge, it has also suggested that increased knowledge does not necessarily improve practice. While a large body of research has been undertaken in the area of compliance with infection control precautions and reasons for non-compliance (e.g. Earl et al., 2001, Cohen et al., 2002), with a lack of knowledge regularly being identified by staff as affecting their compliance, the views of staff about what would improve their own practice may need to be questioned further. There appears to be no clear and definite link between education and practice in the long-term, despite lack of knowledge and education being identified as a reason for poor practice by health care staff. Research is therefore needed which addresses why knowledge does not necessarily improve practice.

The review also identified that student nurses have low levels of knowledge and poor levels of practice in relation to infection control. This could indicate the need for a more comprehensive education programme which clearly links theory with practice. However, as this indication is based on one study, there is a need for further research in other countries which look at the infection control education of students in both university and practice settings and how this impacts on their practice. CAL was identified as an acceptable method of teaching and learning in infection prevention and control, in particular because staff could complete online courses at their own pace and in their own time. As it has previously been identified that time and workload can impact on practice (Cohen et al. 2002), CAL could be considered as a means of addressing this with staff accessing education when they have time available rather than attending more formal sessions where they have to leave their clinical areas for a set time period.

The limitations and methodological issues in some of the studies reviewed have an impact on their results and conclusions which restrict their credibility as evidence of the efficacy of education. Issues such as the use of combinations of strategies and a lack of follow-up data in the long-term lead to difficulties in identifying the overall impact of education on practice and infection rates. Methodological limitations such as sample sizes and approaches used also affect the impact of some of the studies and therefore the reliability of any findings and recommendations made. There therefore needs to be a focus on methodologies which will fully address research aims or an acknowledgement that it may be unethical to isolate one intervention alone while adjusting for others if this may impact on what is already considered to be good practice. While the randomised controlled trial (RCT) is seen as the strongest evidence for interventions (such as education), it is argued that they can have serious limitations in the development of knowledge for use in nursing practice (van Meijel et al., 2004). Van Meijel et al. (2004) also go on to argue that, while RCTs might provide evidence about the effectiveness of an intervention within a specific study group, they do not provide the reasons why an intervention is or is not effective. In some of the areas for future research identified within this review, such as why knowledge does not necessarily improve practice, an RCT would not be the most appropriate research approach, despite its position as the ‘gold standard’ in research. However, it would be more appropriate for identifying whether education does influence practice.

There are limitations to conducting literature reviews. In this review, only 3 databases were searched which may mean that some studies of importance were not identified. Non-English language papers were also not included and these could be a possible source of further research. This review specifically focused on education in infection control in relation to nursing and midwifery. It is therefore acknowledged that it does not include any investigation of research carried out with other health care professions, though some of the studies discussed did include other professions in addition to nurses. It also did not consider the education of patients and carers in relation to infection control. These are areas for possible review which may identify further studies of significance.

This review has identified several areas for future research. Further research is needed to fully investigate the long-term impact of education, infection control education in practice settings for students, the link between knowledge and practice and infection control education in midwifery. There was no research available specific to midwifery within the literature reviewed which raises questions about the perceived value of infection control education in this setting.

Acknowledgement

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References


Paper 2

Infection control in clinical placements: experiences of nursing and midwifery students

Deborah J. Ward

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Abstract

Title. Infection control in clinical placements: experiences of nursing and midwifery students.

Aim. This paper is a report of a study of the experiences of nursing and midwifery students in relation to infection control in their clinical placements and how these affect their learning.

Background. Compliance with infection control precautions has been found to be low in many areas. Reasons for non-compliance include factors relevant to nursing and midwifery students, such as lack of knowledge and lack of a positive role model. However, there is little in the literature about how students experience infection control in placements and how this affects their own practice.

Methods. Semi-structured interviews were undertaken in 2009 with 40 nursing and midwifery students. Analysis of transcripts was by Framework analysis.

Findings. Students identified practices that they had observed and benchmarked these against what they had been taught at university and what was demonstrated by staff perceived as positive role models. Observing inappropriate practice affected student practice both positively and negatively. Students were reluctant to report poor practice due to fear of failing placements and not wanting to be identified negatively by staff. Students believed that practice supported by theory was important to provide them with a rationale for their activities and to support any complaints that they had.

Conclusion. Poor practice in clinical placements can have a negative impact on student learning and practice and may therefore have implications for the practice of future nurses and midwives. In order to maintain patient safety, there needs to be more support for students who wish to identify poor practice.

Keywords: clinical placements, infection control, midwifery, nursing, patient safety, students

Introduction

Healthcare-associated infections (HCAIs) in the United Kingdom are estimated to cost the National Health Service around one billion pounds annually, with additional costs to reputation, patient mortality and other services [Plowman et al. 1999, National Audit Office (NAO) 2009]. The European Centre for Disease Prevention and Control (ECDC 2007) states that the number of patients acquiring HCAI in the European Union every year can be estimated at 3,000,000.
with approximately 50,000 deaths occurring as a consequence. In the United States of America (USA), this figure is around 99,000 per annum (US Department of Health & Human Services 2009). HCAIs are therefore a global problem.

The literature suggests that at least 15% of HCAIs could be prevented by the application of what we already know to practice (NAO 2004). A vital aspect of this is compliance with infection control precautions (ICPs) which are known to be effective in reducing the risks of infection and cross-infection (Fendler et al. 2002). Research has focused on issues such as rates of compliance (Kuzu et al. 2005), reasons for non-compliance (Sax et al. 2005), and means of improving compliance to reduce rates of infection (Fendler et al. 2002). Very little has been written about how nursing and midwifery students experience infection control in practice placements. We also have little evidence about how this experience influences students’ own practice. This is of considerable importance as nursing and midwifery students have an important role to play in the future prevention and control of infection.

**Background**

Compliance with ICPs such as hand hygiene and the use of protective clothing has been found to be less than optimal for several decades (Larson 1981, 1995, Larson et al. 2005). This has been demonstrated in quantitative studies undertaken across Europe (Kuzu et al. 2005), Asia (Ji et al. 2005), the USA (Larson et al. 2005, Golan et al. 2006), Australia (Osborne 2003) and Africa (Brooks et al. 1999) and is therefore a global issue. Hand hygiene compliance has been demonstrated to be as low as 27% (Stein et al. 2003) and compliance with glove use as low as 39% (Ji et al. 2005). Although various methodologies have been used in these studies, such as observation (Golan et al. 2006), questionnaires (Stein et al. 2003) and cross-sectional surveys (Ji et al. 2005), they all show sub-optimal compliance with ICPs. Improved compliance with ICPs has been shown to improve rates of infection (Ryan et al. 2001, Fendler et al. 2002), and it is therefore an important factor in strategies to minimize the risk of HCAI.

Several factors have been demonstrated to affect compliance in infection control. Sax et al. (2005), for example, reported that lack of knowledge was a reason for poor compliance. Lack of knowledge and the need for training are also factors referred to in other reports (Girou & Oppein 2001, Oberdorfer et al. 2003). Other reasons for non-compliance reported in the literature include lack of leadership (Chan et al. 2002), organizational culture (Larson et al. 2000), workload (Cohen et al. 2002), lack of a positive role model (Harris et al. 2000) and risk perception (Naing et al. 2001). Many of these issues are relevant to nursing and midwifery students, who hope to gain knowledge from staff in practice placements and perceive qualified staff as potential role models who will assist them to learn and improve their own practices (Henderson 2002).

The vast majority of research regarding infection control is quantitative and, while Forman et al. (2008) argue that such studies have contributed to vital progress in infection control, they also highlight that such studies cannot assist us in explaining why certain factors affect the use of ICPs. Cole (2006) also explains the value of qualitative research in relation to infection control in describing the experiences, behaviours and interactions of people. Qualitative research can therefore be of value in infection prevention and control. Yuan et al. (2009), for example, used semi-structured interviews to investigate perceptions of hand hygiene practices. They reported that there were several challenges to effective hand hygiene, including lack of resources and the limited organizational authority of infection control teams. Qualitative approaches have also been used to compare espoused and actual practices in infection control. Nichols and Badger (2008), using participant observation and semi-structured interviews, found that there was poor compliance with practices such as hand hygiene, glove use and waste disposal. They also reported that actual compliance was lower than that reported by staff. It is therefore clear from both quantitative and qualitative research that compliance with infection control precautions can be poor, and that there are challenges to implementing good practice. These studies do not, however, address the views or perceptions of students as previous research has focused on qualified practitioners.

Nursing and midwifery students are the qualified practitioners of the future, and as such will be relied upon to practise effective infection control in order to minimize risks to patients. Despite this, very little has been written about how nursing and midwifery students experience infection control when on practice placements, how this affects their perceptions of and compliance with ICPs and what action they take when observing inappropriate practice. Swallow and Coates (2004) have argued that modern health care requires a workforce that is capable of exploring complex issues and has the capacity to develop problem-solving strategies based on reflective decision-making. They further suggested that education is one way of producing such practitioners. The experiences of nursing and midwifery students in clinical placements as part of their overall pre-registration education are therefore of importance in producing practitioners who meet future workforce needs as well as
the needs of their patients in preventing infection. Research is therefore needed which explores this important area to determine what students experience and how this affects their learning. Exploring the perceptions of individuals such as nursing and midwifery students by undertaking a qualitative descriptive study is also important, as Nicol et al. (2009) have reported that individual experience can be more important than formal training in explaining hand hygiene behaviour. Thus, it is possible that individual exposure to different practices in placement areas could have a future impact on practice.

The study

Aim

The aim of the study was to identify the experiences of nursing and midwifery students in relation to infection control in their clinical placements and how these affect their learning.

Design

A descriptive design was used. This design was chosen as it is ideal when the focus of a study is on practices, beliefs and attitudes, which are all included in experiences (Cormack 2006).

Participants

The study was conducted in a university which offers both degree and diploma nursing programmes and a degree programme for midwifery. All second and third year nursing and midwifery students were invited to participate, and those who volunteered were given a participant information sheet detailing the study prior to being recruited. A non-probability voluntary sample was therefore used. A total of 40 students were interviewed to enable data saturation (Cormack 2006).

Data collection

Data were collected using face-to-face semi-structured interviews with nursing and midwifery students between February and August 2009. This type of interview enabled focus while also allowing participants to expand on topics that they considered important. Interviews lasted up to 45 minutes. Questions asked during the interviews included:

- What practices have you observed in all your placements in infection control?
- How do you know whether what you observe is good or inappropriate practice?
- How has what you have observed affected your own infection control practices?
- If you observe poor practice do you take action and if not, why not?
- Have you found what has been taught in the university about infection control to be valuable in practice or not?

These questions were formulated in order to meet the overall aim of the study and were based on placement feedback data from previous students. Additional questions were asked depending on the responses of students, such as ‘You say that you use what your mentor does as a benchmark for good practice. How do you know that her practice is good?’ The researcher was a lecturer in the university who had taught some of the students in large lecture groups, but not others. To ensure that coercion of participants was avoided, invitation emails were sent out via a group email system and only students who emailed to volunteer for the study were contacted. There was therefore no direct individual solicitation of participants. The information attached to the email invitation also stated that participation was voluntary and that the decision to participate or not would not be related in any way to their studies. Students who volunteered were also informed both orally and in writing that they could withdraw from the study at any time without consequences.

Ethical considerations

The study was approved by the appropriate university ethics committees. The data were confidential but not anonymous as participants were seen by the interviewer.

Data analysis

Interviews were digitally recorded, transcribed verbatim and analysed using Framework analysis. This is an approach said by Ritchie et al. (2007) to be systematic and includes the following stages:

- Familiarization of the data.
- Identification of recurrent and important themes in order to develop a working analytical framework.
- Indexing and pilot charting.
- Charting where data is summarized within the finalized analytical framework.
- Investigation and interpretation.

This approach was used as it does not rely on coding and indexing alone, but encourages organization and management of research through summarization, resulting in a robust and flexible matrix (Ritchie et al. 2007).
To achieve inter-coder reliability, the analysis was undertaken by the principal researcher, who saw all transcripts, and by three members of the university’s Framework analysis group, and who analysed nine randomly selected and allocated transcripts.

Rigour
Participants were given copies of their transcripts to verify that they were a true representation of what had been said during the interviews. A sample of participants was also provided with the codes and themes from their transcripts to identify whether they were appropriate, another strategy which improves rigour (Moule & Goodman 2009).

Findings
Forty participants were recruited (see Table 1). Twelve nursing students specified that they had worked as healthcare assistants prior to the course, but participants were asked to describe their experiences during their time as students rather than before this. Six themes were identified: What is perceived as good or inappropriate practice; How students know when practice is ‘good’; The impact of clinical practices on students; Barriers to reporting inappropriate practice; The possible consequences of inappropriate practice; and The link between theory and practice. In the quotes below, the number represents the participant number and the letters indicate nursing student (N) or midwifery student (M).

What is perceived as good or inappropriate practice
Practices that students considered to be both good and inappropriate were identified during the interviews (see Tables 2 and 3).

Practices in community settings
Students were particularly complimentary about community nurses and their ability to adapt practices in often challenging environments:
The district nurses were particularly good ... even though they had limited things cos they were going into people’s houses... They still went out of their way to ... do it in a proper aseptic non-touch manner (P1 N).

Table 1 Characteristics of study participants

<table>
<thead>
<tr>
<th>Programme</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing degree</td>
<td>8</td>
<td>8</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>Nursing diploma</td>
<td>9</td>
<td>6</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Midwifery degree</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>9</td>
</tr>
</tbody>
</table>

Table 2 Examples of inappropriate practices identified by students

<table>
<thead>
<tr>
<th>Practice</th>
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</thead>
<tbody>
<tr>
<td>Reusing single use items such as suture cutters</td>
</tr>
<tr>
<td>Reusing scissors in dressing procedures between patients</td>
</tr>
<tr>
<td>Insertion of a urinary catheter without wearing gloves</td>
</tr>
<tr>
<td>Not changing protective clothing between patients</td>
</tr>
<tr>
<td>Not decontaminating hands when required e.g. after glove removal and before and after procedures on patients</td>
</tr>
<tr>
<td>Washing hands with water only</td>
</tr>
<tr>
<td>The wearing of hand and wrist jewellery</td>
</tr>
<tr>
<td>Reusing items without thorough cleaning between patients</td>
</tr>
<tr>
<td>Poor cleaning standards e.g. mould inside lockers, trolleys not being cleaned between patients in theatres</td>
</tr>
<tr>
<td>Poor sharps management practice e.g. resheathing of needles after use, overfilling sharps bins, walking around with unsheathed needles</td>
</tr>
<tr>
<td>Poor practice in relation to intravenous therapy e.g. disconnecting intravenous line from access device, dropping it on the floor and then reconnecting it</td>
</tr>
<tr>
<td>Storage of sterile items under a leaky sink in the sluice</td>
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<tr>
<td>Incorrect sampling of catheter specimens of urine</td>
</tr>
<tr>
<td>Dealing with body fluids and removing intravenous cannulae without wearing gloves</td>
</tr>
<tr>
<td>Using a mobile phone while dealing with a used bedpan</td>
</tr>
</tbody>
</table>

Table 3 Examples of good practices identified by students

<table>
<thead>
<tr>
<th>Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not re-using single use items</td>
</tr>
<tr>
<td>Practices in theatres and intensive care</td>
</tr>
<tr>
<td>Daily and weekly audits</td>
</tr>
<tr>
<td>Having equipment available in community to take into houses</td>
</tr>
<tr>
<td>Not touching curtains after hand washing</td>
</tr>
<tr>
<td>Different coloured aprons for different tasks</td>
</tr>
<tr>
<td>Waste segregation (clinical and non-clinical)</td>
</tr>
<tr>
<td>Changing gloves between patients</td>
</tr>
<tr>
<td>Cleaning bed areas thoroughly after patient discharge</td>
</tr>
<tr>
<td>Keeping sterile field sterile during procedures (wound dressings, catheterization)</td>
</tr>
<tr>
<td>Having gloves and aprons available near patient beds</td>
</tr>
</tbody>
</table>

Practices by non-nurses
Interviewees also spoke about other healthcare staff and how they perceived their practices. Doctors were generally perceived negatively with regard to hand hygiene practice, whereas other professionals had generally been observed to comply well with good infection prevention and control practice:

I have to be fair, a lot of doctors on the wards don’t seem to ever wash their hands. (P8 N)
I’ve seen things like radiographers and physiotherapists, and they seem to be quite good, they always seem to wash their hands and keep their equipment clean (P13 N)

Practices in aseptic technique
Interviewees commented on various aseptic procedures such as catheterization, wound dressings and intravenous therapy:
I thought it was really good, actually. She was very, very thorough. I mean, she was obviously talking me through it, because it was the first time I’d seen the aseptic technique (P10 N)
I saw someone… they wanted to take some stitches out… and they re-used the stitch thing on someone else, because they thought it was clean … and they’d already used it, and then went, ‘Oh dear!’ (P2 N)

Standard precautions

Many general comments were made about standard ICPs.
Again, students had both positive and negative experiences to report:

Oh, I’ve seen so many things where they’re running around looking for a sharps bin with a needle in their hand! (P4 N)
The best thing I’ve seen is on intensive care… everybody takes that extra time to be extra vigilant with it, with aprons at the end of each bed, specifically for that patient, really making sure the washing of hands afterwards, the alcohol gel used (P5 N)

Comments including the one above identified that good practice could be facilitated by the availability of appropriate resources in a convenient location.

Cleanliness

Cleanliness was referred to both positively and negatively:

You could open a locker and there was, like, mouldy cheese in there… they’d not been cleaned out. (P6 N)
I’ve seen midwives and health support workers cleaning down the beds, and cleaning all aspects of the bed when a patient’s gone (P15 M)

How students know when practice is ‘good’

Some students specified how they judged practices to be good. They identified that a qualified practitioner’s level of knowledge and the fact that other staff members sought that practitioner’s opinion were evidence that their practices were good:

Just because… they seemed to know everything, and seemed to be able to do everything, and everyone came to them for advice, and so the things they were doing… lining up to the things we’d been taught in university. (P1 N)

Others also commented that what they had been taught at university was the standard against which they would judge practice, in combination with good role models in practice and policies and procedures:

Partly from what I’ve learnt at university and partly from people that I feel have taught me good practice and actually said about… why we do it in a particular way (P22 M)

I decide what’s good or bad by looking at the policy of where I’m working, and what I’ve been taught at university. (P26 N)

The impact of clinical practices on students

Most students identified an improvement in their level of knowledge, practice and confidence during the programme:

I think I’ve learnt a lot. I think, as well, seeing… bad practice has made me not do it, like it’s made you more aware of what you’re doing, and everything you do, you think twice about… if you’re following the right procedures and things (P7 N)

Some other participants also commented about the effects of observing poor practice on their own clinical practices. These effects were both positive and negative:

It makes me more keen to do things properly when I see people who don’t do things properly, and I think, ‘Oh, my gosh, that’s really shocking’, and if someone new who was watching me do something badly, then I wouldn’t want them to feel the same as what I feel. (P4 N)

On this ward I’ve probably lowered my standards a bit. I think it’s just because the practice on that ward, and you just try and fit in with the ward, don’t you, and I’m not really worried about people laughing or anything, but, they might be thinking, ‘Why is she bothering doing that? It’s just pointless!’ (P23 N)

There was also comment about how perception of good practice changed depending on the prevailing practices on their current placement, and this led to some confusion amongst students:

I think I know a bit more about what I should be doing, but at each placement you get told a different thing, so my philosophy is continually changing, depending where I am, and I’m not quite sure what’s the right and the wrong thing to do. (P13 N)

Barriers to reporting poor practice

Most students interviewed stated a reluctance to mention a member of staff’s poor practice to them or others or to use the official reporting process to highlight poor practices. One of the main reasons for this was the fear of a negative end-of-placement report:

Just because they’re, like, quite senior… when you’re in practice, it’s really difficult … to get on, because you’re worried that, you know, if you started to cause a bit of trouble, or say something to upset somebody, that could then affect you getting signed off (P16 N)

Another reason was that staff might not be particularly friendly with them for the rest of the placement:
Not wanting to rock the boat, kind of thing, and it’s like being seen as the one that’s causing the problems. (P12 N)

Some students felt that it was not their place to say anything to other staff due to their position as a student and perceived lack of knowledge and experience related to this position:

Because they could very easily turn round and say, ‘Well, what do you know? You’re only a student’. I guess it’s just a question of respect as well. (P3 N)

There was also an issue of power in relation to doctors not being challenged by students or qualified staff:

No, they don’t say anything to the doctors, probably cos they just get ignored or shouted at and see the doctors as being higher than them (P38 N)

Students also commented that their confidence increased over the course of the 3-year programme, and that this would increase their probability of reporting poor practice:

In your third year, you’re going to be a bit more confident to challenge things, aren’t you? You know, like in your first year… you’re not confident enough to challenge anything really, in practice, but I suppose as time’s going on, you’re getting a bit more confident of what should and shouldn’t be done (P6 N)

However, some students were concerned about their lack of ability to challenge poor practice. They found themselves questioning whether they could be a patient advocate if they were unable to be an advocate for themselves in challenging poor practice and defending their own practices:

It’s like, ‘Oh yeah, I’m an advocate, I’ll do this, I’ll speak up’, but the reality is completely different… and I don’t want to rock the boat, so I know if I can’t do that by myself… whether I could speak up on behalf of the patient. (P9 N)

The possible consequences of poor practice

Some students spoke about consequences which were perceived to be due to non-compliance with infection control policies:

And my poor mentor, the other day… had gone to the next bed to try and help one of her colleagues, and she was doing some suction and she got sputum in her eye, because she hadn’t worn the protective eye goggles that she had. She’s been back and forward to occy (occupational) health because she’s a hep(atitis)-C positive patient. (P3 N)

Others also spoke about possible consequences if procedures were not fully followed. One student, commenting on staff overfilling sharps bins, said:

So I suppose the potential for a sharps injury is so high that it’s a real risk that people should be aware of, because there are lines on the inside that are quite clear, and it’s much easier if you go and get a new one, you’re not having to push things down and struggle. (P8 N)

Another student commented on the risk of acquiring specific infections:

I realise now, with what I’ve been taught in the university, and what I’ve been taught by nurses, the impact of these illnesses on these patients… and I just think it’s such a big risk to run if you don’t practice good infection control (P11 N)

The link between theory and practice

Students were clear that there was a link between theory and practice and that having theoretical knowledge was valuable in underpinning practice, particularly in understanding why certain procedures were important:

I’ve been able to relate that to my understanding, because once I’ve learnt the theory, I can relate that practically, and understand why I wash my hands, why I put on protective aprons and gloves, why I dispose of them afterwards. (P5 N)

Students also gave examples of the possible consequences of not understanding the theory relating to practice:

There’s no point doing something and not knowing why you’re doing it. I was just recently talking to some of my friends that came back from Africa… and they were saying that a lot of the nurses were doing these things but they obviously didn’t have any idea why they were doing it. So, for example, they were cleaning down the equipment, but they were using one cloth, one bowl, and going from the dirtiest to the cleanest, and so they obviously didn’t have a good understanding of why they were cleaning, otherwise they wouldn’t have done that. (P20 N)

Several students also identified that theoretical knowledge could allow them to challenge poor practice:

I feel, like, if you want to say something to someone, that their practice was bad, through the education you’ve been given through the university, you could actually say, ‘Well, NICE (National Institute for Health Clinical Excellence) says …’. (P11 N)

Discussion

Study limitations

Several limitations can be identified in this research. Although all nursing and midwifery students in years 2 and 3 had the opportunity to participate, the resulting sample was voluntary and the characteristics of those who volunteered may have differed from those who chose not to do so (Polit &
Beck 2005). The majority of students were in year 2 of their programme and, as these students were not near to completing their programme yet, they might not have been involved with some of the more complicated procedures, such as intravenous therapy. However, as hand hygiene is considered to be the most important intervention in the prevention and control of HCAIs (Damani & Emmerson 2003), students across all years should have been exposed to this and other ICPs. There are also limitations to the study with regard to the single university site used as, although students experienced clinical placements across several healthcare organizations, they were all students at one university. Interviews are also a self-report method and so this study reflects the personal views and experiences of participants; information was not collected about actual behaviour in clinical areas. However, this was the aim of the study and is usually the focus of qualitative methods such as interviews (Polit & Beck 2005).

Practices reported by students

It has been argued that the critical role of research in nursing practice is the application of nursing theories to discover new knowledge (Khowaja 2006). King’s conceptual framework for nursing (King 1981) is organized around three interacting systems and these can be applied to the findings of this study (Table 4).

The practices observed by students in their practice placements were similar to those previously reported by qualified staff. Stein et al. (2003), for example, has previously reported, through qualitative means, that compliance with hand hygiene before and after patient contact, the use of gloves when dealing with body fluids and the safe use of needles were all less than optimal. Students sought validation for their views of what good practice is from the university and from staff in practice whom they viewed as confident and a source of advice for other qualified staff. Their benchmark for good practice was therefore influenced by both theory and their observations of staff in practice. Research participants’ views of role models have previously been reported by Donaldson and Carter (2005), who stated that nursing students find good role models to be important in teaching good practice skills and appropriate behaviour. Students were also reported to perceive good role models as being those who had a positive influence on the clinical area and therefore on the practice of others. Scott et al. (2005) have reported that senior nurses see themselves as positive role models in infection control if they are approachable, clinically credible and authoritative. In the present study, students were clear that observation of good practice could have a positive influence on their own learning. Role modelling and interactions which can promote good practice fit within the interpersonal system of King’s model and some of the concepts in that system.

However, there was also the view that poor practice could have an effect on students’ learning and practices. Some, having previously identified what good practice was, were more determined to demonstrate appropriate practices when faced with poor practices from others. However, some admitted changing their practices due to the influence of staff members. It is clear, then, that poor role models can have an impact on infection control practices, in both positive and negative ways. Thus, while the interpersonal system in King’s model can have a positive impact on practice, it can also adversely affect it, depending on how the concepts within the system such as interaction and communication are applied.

Henderson (2002) has previously noted that the application of theory from university into clinical practice can be impeded by poor role models. While students in this study used what the university had taught them as a baseline for good practice, this could be undermined by the clinical practices demonstrated by qualified staff. Differing practices

Table 4 Application of King’s theory to study findings

<table>
<thead>
<tr>
<th>Interacting system</th>
<th>Concepts within system</th>
<th>Application to the study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal</td>
<td>Perception</td>
<td>How students view their own experiences and level of knowledge and how these affect practice and attitudes</td>
</tr>
<tr>
<td></td>
<td>Self</td>
<td>Personal beliefs about infection control</td>
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<tr>
<td></td>
<td>Growth &amp; development</td>
<td>Expectations of placements</td>
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<td></td>
<td>Body image</td>
<td>How confidence grows and develops over time and with experience and knowledge</td>
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<tr>
<td></td>
<td>Space</td>
<td>Role modelling</td>
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<tr>
<td></td>
<td>Time</td>
<td>How qualified staff interact and communicate with students</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Human interactions</td>
<td>Role modelling</td>
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<tr>
<td></td>
<td>Communication</td>
<td>How students see their role</td>
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<tr>
<td></td>
<td>Transaction</td>
<td>Fear of consequences of reporting poor practice</td>
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<td></td>
<td>Role</td>
<td>Response from staff to challenges to practice</td>
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<tr>
<td></td>
<td>Stress</td>
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<tr>
<td>Social</td>
<td>Organization</td>
<td>How students see their position in relation to others</td>
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<tr>
<td></td>
<td>Authority</td>
<td>How theoretical knowledge is used in decision-making about what is good practice</td>
</tr>
<tr>
<td></td>
<td>Power</td>
<td>Bowing to those seen as superior and deserving of respect</td>
</tr>
<tr>
<td></td>
<td>Status</td>
<td>Basing decisions on placement outcome, responses of others to their practice</td>
</tr>
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<td></td>
<td>Decision making</td>
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Infection control in clinical placements

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What is already known about this topic

- Compliance with infection control precautions can be poor.
- Many reasons for non-compliance have been reported by nurses.
- It has been suggested that education has an impact on infection control practice.

What this paper adds

- Nursing and midwifery students judge good infection control practice on the basis of theoretical knowledge and good role models and see a clear link between theory and practice.
- Students are reluctant to report poor infection control practices due to possible consequences for themselves.
- Poor practice observed by students can have both positive and negative impacts on the infection control practices of those students.

Implications for practice and/or policy

- Clearer systems for reporting poor practice which provide support for them need to be available for students.
- Healthcare professionals need to be made more aware of the impact of their practices on their students’ learning and future practice.
- Clearer links are needed between educational providers and practice placements in order to support students to identify good practice and to emphasize that clinical placements are educational environments for nursing and midwifery students.

also caused confusion, with students wondering whether poor practice was acceptable after all; this could have a real impact on their learning and on their future clinical practices.

The reports in this study of poor hand hygiene practices by doctors has occurred previously in other studies. Brown et al. (2008) reported that nurses had a sense of a constant struggle against doctors who were not applying good infection control practices and behaved as if the rules in clinical areas did not apply to them. The data reported in this paper highlight that the perceptions of qualified staff and students may be the same with regards to the practices of doctors. Poor compliance with hand hygiene amongst doctors has been reported in previous quantitative literature (Suchitra and Lakshmidevi 2006, Creedon et al. 2008). The view of students in the present study of poor practice from doctors that was not challenged by nurses matches issues of authority, power and status within King’s social system. The perception of other professionals such as physiotherapists having higher rates of compliance is also supported by previous quantitative data. Waqqas et al. (2002), for example, found that compliance with ICPs was higher among physiotherapists than doctors and nurses.

Although many students in the study talked about poor practices that they had seen, most stated a reluctance to report or challenge these practices due to what they perceived might happen to them as a result. Henderson (2008) has previously questioned why midwifery students do not challenge poor practice, and suggested that there was a fear of gaining a ‘bad reputation’ which might affect future employability. This was an issue reflected here, with clear reluctance to challenge and report poor practice as a result of fear and in some cases out of respect for those more senior to them, which relates to students’ perceived level of control. This again demonstrates concepts within the social interacting system of King’s model, where authority and power may affect actions.

Students who had observed the consequences of poor practice were clear that such occurrences could have been prevented by the application of ICPs, and therefore they had learned good practice as a result of these incidents. Some considered such occurrences to be accidents due to barriers to good practice, such as a lack of equipment available nearby. Difficulties with facilities are a barrier to good infection control practice that has been identified in previous quantitative studies (Earl et al. 2001, Cohen et al. 2002). However, the present students also commented that, even when facilities were available to minimize risks, clinical staff did not always use them. This finding has been reported previously by Lankford et al. (2003), who found that hand hygiene was not improved by the provision of more facilities. Other students identified the possible risks related to and consequences of poor practice, and this had a positive impact on their practices as they were keen to reduce risks to patients and themselves. This is a positive finding, as previous research has highlighted an association between lack of perception of risks and poor infection control practices (Chan et al. 2002, Ji et al. 2005).

Conclusion

Inappropriate infection control practice can have implications for student learning and student practice and may therefore have implications for the future practices of nurses and midwives. The findings have implications for nursing and midwifery educators in both academic and practice settings, as issues have been identified that have an impact on clinical practice and which highlight the importance of supporting practice with theory. While education of healthcare staff has been identified as a strategy to improve infection control
practices, there needs to be clearer awareness that clinical areas are educational sites for students, and that education in practice can and does have an impact on their clinical practices. There is also a need for clear guidelines for students in practice settings so that they are aware of what good practice is. Students need to be encouraged to question the rationale for practices so that they can clearly identify best practice. There also appears to be a need for clear educational links with clinical areas to reinforce the fact that they are educational environments where students learn most of their clinical skills.

Lack of support for and confidence in reporting or challenging poor practice may have implications for patient safety and therefore clearer and more supportive systems need to be in place, both for reporting by students and action in practice to address poor practices as a result of such reporting.

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Conflict of interest

No conflict of interest has been declared by the authors.

References


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Paper 3

The infection control education needs of nursing students: An interview study with students and mentors

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Summary

Aim: To identify and explore the infection prevention and control education needs of nursing students as perceived by students and mentors.

Methods: Semi-structured interviews were undertaken with 31 nursing students within one large university and 32 nurse mentors in one large NHS Trust. Interview transcripts were analysed using framework analysis.

Results: There were perceived deficits in both levels of knowledge and clinical skills but the emphasis placed on these differed between nursing students and nurse mentors. The use of small group and interactive methods for teaching and learning was preferred, in particular to encourage less confident students to participate more. Assessments in practice placements of specific skills were identified as a good teaching and learning tool by both students and mentors. Infection prevention and control education was considered to be a joint responsibility between the university and Trust, though there was acknowledgement that this joint working was not always evident. Clinical credibility was considered particularly important by mentors in those who teach students.

Conclusion: There may be deficits in the education provided to nursing students in this area. Teaching and learning preferences and strategies for improving some areas of teaching and learning have been identified and several areas for future research have been suggested.

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Introduction

It has been identified both nationally and internationally that education should be a part of any overall strategy for infection prevention and control (IP&C) in health care settings (Department of Health, 2009; Australian Government, 2004). As future practitioners, nursing students have an important role to play in IP&C and therefore need to be taught good practice both in their clinical placements and by their educational institutions as part of their pre-registration preparation. Despite this, a literature review (Ward, 2011) identified that there was a lack of research focusing on the education of nursing students with regard to IP&C.

This study aimed to identify and explore the infection control education needs perceived by both nursing students and their mentors in one university and large NHS Trust in the North of England.

Literature review

As previously stated, there is a dearth of literature involving nursing students in relation to IP&C education. However, there are studies which identify issues within nurse education which may be relevant starting points for future research. Wu et al. (2009a), for example, reported that nursing students have low levels of knowledge of IP&C and are poor at applying their knowledge to practice. Though this study was carried out in Taiwan, it may still be relevant in other countries and it identifies an issue that is therefore worthy of further investigation. Wu et al. (2009b) reported further on their previous research, discussing the effectiveness of a purpose-designed education programme on the understanding and practice of nursing students in IP&C. The authors reported that, while the education programme improved knowledge, it did not have an effect on the ability of students to apply IP&C precautions correctly. There is clearly an issue here of knowledge not being implemented in practice which supports previous research in IP&C which found that an increase in knowledge does not necessarily result in improvements in practice (Santana et al., 2008).

Reime et al. (2008) investigated the examination outcomes and preferences of nursing students for two education methods in IP&C and reported that e-learning and lectures scored equally well on both knowledge scores and student preference. Mikkelsen et al. (2008) also reported on a comparison of teaching methods for cross-infection and identified that scenario-based simulation made nursing students more aware of the complexity that patient cases may present.

Previous literature has addressed in part the relationship between nursing students and IP&C without an emphasis on education in this context. Further research is needed to identify the current education needs and preferences of nursing students in IP&C and to explore the reasons behind any differences in perceptions between nursing students and nurse mentors.
area. Cassidy (2006), for example, considered the experiences of nursing students caring for infectious patients who were isolated but this was not specific to education in IP&C. Barrett and Randle (2008) studied nursing students’ perceptions of hand hygiene practices and identified barriers to good hand hygiene. While this contributes to the literature regarding non-compliance with hand hygiene, it does not necessarily make clear links with nurse education. This limited literature which involves nursing students and IP&C education indicates a need for further investigation in this area to ensure that the educational needs of these students are being met in order to produce safe future practitioners. This in turn has the potential to reduce the risk of infection to their patients.

Research methods

Study aims

The overall aim of this paper is to report on an exploration of nursing students’ and mentors’ perceptions of the IP&C education needs of nursing students. In order to meet this aim the following research questions were used:

1. What preparation do students think that they need from the university prior to practice placements?
2. How do students think IP&C should be taught and where?
3. How prepared do both students and mentors think students are when they enter clinical placements?
4. What do mentors think about the knowledge and practices of students that they have mentored in relation to IP&C?
5. Who do mentors think should teach IP&C to students and how should this be done?

Design

A descriptive design was used as this approach is said to be ideal for the exploration of the beliefs of different groups of people (Houser, 2008) such as nursing students and mentors.

Data collection and sample

A qualitative approach was adopted in order to meet the overall aim. Semi-structured interviews were undertaken on a non-probability voluntary sample of nursing students in years 2 and 3 of their programmes at one university in the North of England. The students were undertaking either diploma or degree programmes. Invitations were sent to a stratified non-probability sample of mentors within one large NHS Trust in the North of England which was used by the university for placement provision, stratified for the four hospitals within the Trust to ensure a range of mentors across different specialities. Non-probability sampling is common in qualitative research where the sample is not randomly selected (Rubin and Babbie, 2009). The results derived from such a sample are therefore the results of those who respond at a given time which may or may not represent the population under study. Williams et al. (2006), however, argues that a non-probability sample is not necessarily unrepresentative of the population. The resulting sample was voluntary in that not all participants who were invited participated and all those who volunteered were interviewed. This NHS Trust was used by the university for clinical placement provision. An interview schedule was used in order to promote a more focused approach (Polit and Beck, 2005) and a total of 31 nursing students and 32 nurse mentors participated in the study. Interviews were tape recorded and transcribed verbatim.

Ethical considerations

Ethical and research governance approval was sought and gained from the relevant University and NHS Committees. It was identified that there was the potential for coercion amongst students who knew and had been taught by the interviewer and that there may be bias in responses about what had been taught at the university as a result of this. The issue of coercion was addressed by an invitation e mail being sent out to whole cohorts of students with the information leaflet attached so that only students who volunteered were directly contacted by the interviewer. All students were also made aware that the choice to not participate or to withdraw from the study at any point would not affect their studies in any way. This information was provided both verbally and in writing on the consent form. Some of the students had been taught by the interviewer and others not and students were asked to be as honest as possible but were not asked to specify the names of lecturers or the dates of specific sessions. It has been identified that this type of position may be advantageous in that the researcher may have a deeper understanding of what is being studied and a better relationship with participants (Morse and Field, 2003). However, it was ensured that participants were aware that the interviewer was seeing them in her role as researcher as opposed to lecturer in order to separate the two roles in the minds of the students.

Data analysis

Data were analysed using framework analysis, a method of coding and analysing interview transcripts designed by NatCen (Ritchie et al., 2007). All transcripts were analysed by the principal investigator. Framework analysis involves several stages including:

- Familiarisation of the data
- Identification of recurrent and important themes in order to develop a working analytical framework
- Indexing and pilot charting
- Charting where data is summarised within the finalised analytical framework
- Investigation and interpretation.

Although this method of analysis uses a thematic approach, it is said by Rabiee (2004) to allow themes to be developed from the narratives of those participating in the research as well as from the research questions initially posed. It therefore allows flexibility while also being systematic. It also provides a framework for the discussion of results around the themes identified by the analysis.

Rigour

In order to improve rigour, a sample of transcripts was analysed by members of the local Framework Analysis Group. This enhances reliability and helps to set aside any preconceptions by the interviewer as a lecturer in infection control (Malterud, 2001). Study participants were provided with copies of their transcripts to verify that they were an accurate representation of each interview.

Findings

From the data, several themes emerged. Where direct quotes are used, S denotes student nurse and M denotes nurse mentor.

Deficits in the knowledge of students in practice

Several mentors identified areas where they felt that students were lacking in knowledge about IP&C which they felt was important prior to commencing a clinical placement. It was clear that students were aware of basic information about standard precautions but
mentors expressed a belief that knowledge beyond that was required and that students having a greater depth of knowledge would assist them in their role as mentor:

*Me personally I'd like to see them be that little bit more knowledgeable ... not just about our practices, what we do, have a little bit more knowledge about micro-organisms and transmission and infection rates and stuff, that would help me, really as a mentor.* M5

The deficits in knowledge identified by mentors were specific to theoretical knowledge as opposed to knowledge of clinical skills. Students, however, focused much more on their skill rather than knowledge deficits prior to commencing practice placements:

*Like practicals, because I think that's the best way you learn, and if people haven't seen as much good on the words, then in ... if we had practicals, they could actually practice, and then when they go on to the wards they know exactly, step-by-step, how they're supposed to be doing things.* S7

**Education as a barrier in practice**

While focusing primarily on clinical skills acquisition, some students also identified how education, or lack of it, from the university could become a barrier in practice. This was stated to be related to the fact that there were conflicting practices in clinical placements and students had not been prepared by the university with theory relating to these practices. This meant that students remained confused and were unclear about which practices were appropriate. They also believed that they may have learnt inappropriate practices due to a lack of comprehensive information from the university about what the ‘correct’ procedure was for each nursing intervention:

*They need to go right back to basics, like setting up an IV [intravenous line] aseptically, that sort of simple ... simple clinical infection control and prevention stuff that people get to third year and still, now, I have to stop and think, “Right. What am I doing?” “Am I doing it right?” “Am I doing it the wrong way?” I still find myself having to go and ask people, so I feel like that's quite a big barrier.* S1

While talking about what was taught at the university, this quote still demonstrates the emphasis on being taught about clinical skills so that students know what is ‘right’. Students in year 3 were still confused about what good practice was due to conflicting practices and felt that it was the role of the university in each clinical procedure to specify what best practice was:

*When I've had sessions that have been very in-depth about certain things, you know, it's not that I don't learn ... I do pick that up, but infection control is one that I think, because you get all the conflicting messages, and then the University haven't really come and said, “This is our one set way. This is how it should be done”, sort of thing, and “This is best practice, and anything other than this is not good practice”, do you know what I mean?* S17

Again, while talking about lack of education from the university, this still focuses on knowledge of clinical skills.

Mentors were less concerned about clinical skills as they were of the opinion that this was something that students should be taught when they commenced their clinical placements so that their practices were in line with local policies which, mentors acknowledged, may be slightly different in each organisation:

*Well, I think that the skills, like clinical things, can be taught more when they get here so they get our way of doing things, cos that might be different to the last place they went.* M13

Preferred/recommended methods of teaching and learning

Both students and mentors expressed ideas about preferred methods of teaching at the university or what they believed would be more effective to enhance student learning.

There was a distinct preference for small group teaching as opposed to large lecture-based sessions as this promoted more interaction and encouraged less confident students to speak out and ask questions which they did not necessarily do in much larger lecture groups:

*The lectures were smaller – the lecture groups – and I think that makes it easier and more interactive. And now in third year, we've been all together again, in the big lecture theatre, and it's like people talk, and, you know ... because they're not small, you just don't interact as much, you don't get involved, and you're not as interested.* S4

The smaller seminar groups mean everyone gets the opportunity to ask questions and interact with the teacher ... that doesn't happen so much in large lectures, it's the same people who speak out and answer the questions and then everyone else switches off after a while. S29

Mentors also suggested small groups as an appropriate method as a way of encouraging less confident students to participate:

*Maybe small lectures, not like the big lectures, maybe small seminars you know so the students are able to ask questions if they don't particularly understand an issue, that they're still confident enough to ask questions in the small seminars.* M5

There was also a preference for theory being followed immediately by practical sessions so that what had been learned in theory could be applied to practice:

*I think one of the problems is that you have the theory which is very good but then you wait a long time to apply it in the skills labs and in practice areas .... You forget it so while you're learning the mechanics of clinical skills you can't remember the theory to support them. I know it's hard with the number of students and everything but it would be good, if we could have the theory and then the practical on the same day.* S31

Students also commented on the frequency of infection control education, specifying that it should be provided every 6–12 months as while any updates were useful, they weren't provided often enough:

*The points that people brought up was really really, good, but I think perhaps a little bit more, say like once or twice a year or something perhaps, you know, it's a reminder every time.* S11

Mentors were asked how they thought IP&C should be taught to student nurses. They emphasised the need for a collaborative approach between the university and local healthcare organisations to ensure integration of theory with practice, but also to ensure that, in addition to national recommendations, students were taught about local policies on arrival in different placement areas:

*We should work more closely together, the uni and the trust, so that we know what we're each teaching them. The uni could teach them the theory and then we teach them to apply it into practice within the local policies and procedures that we have in place. They could do this at each placement, at each Trust so it makes more sense to the students.* M30

Several students commented on the use of hand inspection cabinets as a teaching aid for learning about correct handwashing
and stated that this made the information provided more relevant to practice and to them personally:

**Infection Control came up to a ward, they had a luminous box thing, and you put cream on and rub it in, you know … wash your hands. I think that was really good, it just shows what bits of your hands you actually miss, and obviously everyone will wash their hands slightly differently, and I noticed that I missed the backs of my hands when I first had a go at it, and … yeah, I now make a conscious effort to make sure I do wash the backs of my hands. S11**

More interactive lectures rather than traditional lectures were also identified as being effective, in particular in raising the profile of IP&C by generating discussion:

**There were video clips and pictures and we had to spot what was wrong with the pictures — like the taps, sharps bins on the floor and overfilled, clinical waste being put in the wrong bin, that sort of thing and that was really good because it got us all talking and thinking about infection control. S30**

**Comparison of information provided by the university and practice placements**

Students were clear in their view that the information provided by the university was up to date and relevant and, in fact, at times found university information to be ahead of changes being introduced into their placement areas:

**If anything, it's [university education] maybe ahead of practice, because I remember … there was a picture that we had, it was like two taps or something, but they were like those lever type ones that you use with your elbows, and I remember [the lecturer] saying, “What's wrong with this picture?” … none of us answered, and we're thinking, “... there's nothing wrong with it”, and then [the lecturer] said about the … you know, it's like a basic thing, but it should be mixer taps. S10**

Both students and mentors commented on teaching and learning in IP&C being a joint responsibility between the university and practice placements, bringing theory and practice together to learn more effectively:

**Because it's all combined, it's University, it's practice, and it's the skills sessions, and half of that is really up to you to learn these things as well, but what the University has given us is relevant, but what I'm trying to say is, it's across … the environment I'm in, it's the skills lab and the University that's taught me a lot about infection control. S12**

**I think it should be done jointly, really, I think it should be done via the university but I also think it should be taught by the Trust as well where they're actually working so [the Trust] ...should train the student nurses here, ... especially with regards to the Trust policies, policies will change from Trust to Trust so…we're teaching them our Trust policies... I think the responsibility is with the Uni and the Trusts as well. M5**

Mentors expressed the opinion that theoretical information from the university might be up to date but where clinical procedures were concerned, this might be better taught by practitioners who might be seen by students to have more clinical credibility:

**Well, the infection control nurse could do it, they're more up to date on the skills things with infection control than the uni I would have thought — it's also about being clinically credible and I don't think the uni lecturers always have that credibility with the students like we have. M3**

Assessment as a teaching and learning approach

Both mentors and students identified assessment of practice of both qualified and student nurses as being a valuable teaching tool to identify where practice was inappropriate and to raise standards of care:

**Well, I think it [aseptic non-touch technique (ANTT) assessments] helps us, we see the benefits as qualified nurses going for your annual assessments, it just keeps you up to date as well and err any bad practices that we may pick up are identified at our annual assessment. M5**

**Maybe someone actually coming out on to the wards, to assess us doing things, test us, just to see how we're doing, and just to observe what we're doing, because we might doing things that we're not even realising. S13**

**Qualities needed to be an effective teacher**

Students gave examples of good theoretical sessions that they had received and poor ones and generally felt that the lecturer/teacher providing the education was key to how enjoyable and valuable it was perceived to be. Student particularly appreciated humour which made topics memorable and sessions delivered by people who were clinically credible and could relate the topic to clinical nursing practice:

**It has to be delivered clinically, clearly and so on, but it needs to be made a little bit more interesting, or have some more humour brought in, because when you add humour into the lecture, then you make it just that ... upper level ... just a little bit more light-hearted, people will absorb easier, whereas if it gets very heavy, very deep, people tend to switch off. S6**

**It would have been better if it had been with some kind of practical session, and maybe given by a nurse or something, because it was, like, a head of a hospital, and the type of talk that I felt was more academic, so he was giving us all these academic, like, tables and graphs, and it didn't really relate. S2**

Discussion

The interviews undertaken with students and mentors demonstrated that there are perceived deficits in both levels of knowledge and clinical skills when students enter practice placements. However, there were differences in the emphasis placed on these by students and mentors, with mentors identifying knowledge deficits and students focusing primarily on deficits in clinical skills. The focus on clinical skills acquisition as a priority for students in year 3 of their programme could be a cause for concern as this detracts from the need for knowledge and skills in other areas such as critical thinking and clinical decision making. In relation to IP&C, students focused on clinical skills aspects such as intravenous site dressings and aseptic non-touch technique but did not refer to areas where decision making would be required, such as risk assessment in the allocation of isolation rooms. There was also no reference by students to a need for more knowledge in areas so that they could understand the rationale for interventions — this was seen as much more important by mentors. It has been argued that, as the nursing role changes, a shift is needed from task-training and the development of psychomotor skills to place the emphasis on issues such as safety, quality and professional nursing roles (Preheim et al., 2009). However, it seems from this study that many student nurses still place their emphasis on learning clinical skills rather than other less practical aspects.
Both mentors and students identified smaller and more interactive methods of teaching to be preferred. Previous research has identified that student nurses favour practical teaching sessions over more formal approaches (Meehan-Andrews, 2009) and this would appear to be reflected in the study being reported here where students focused more on deficits in clinical skills and practical aspects of nursing than on knowledge base. The use of interactive tools such as the hand inspection cabinet and pictures was identified as a way of maintaining the interest of students and promoting discussion about IP&C issues. Valid reasons were provided for these preferences for small group teaching and interactive sessions by participants in this study. However, due to the qualitative nature of the study, it needs to be acknowledged that these are reasons perceived by participants rather than being based on any evidence of efficacy in promoting more discussion amongst less confident students and raising the profile of IP&C. It also needs to be considered, given previous research about knowledge and practice, that a preference for teaching approaches may not actually have an overall impact on learning, particularly in translating knowledge into practice. This is an additional area which warrants further study in IP&C education for nursing students.

The identification of assessment as a way of learning and improving standards in practice is interesting as while this relationship has been investigated widely in the academic context (Tiwari and Tang, 2003; Leung et al., 2008), the literature surrounding assessment as a learning approach in clinical practice, and specifically in IP&C, is limited. In general clinical practice, it has been reported that practice assessments can adversely affect learning by promoting a surface learning approach in student nurses who focus primarily on the assessment requirements rather than on learning in clinical practice as a whole (Tiwari et al., 2005). It would therefore seem reasonable to consider the use of less formal assessments in practice or to review ways of approaching assessment which promote deeper and more holistic learning in clinical practice placements. While assessment of practical skills in nurse education has been approached by many universities by the use of objective structured clinical skills evaluation (OSCE) and such assessment is considered to be meaningful, fair and good preparation for clinical placements (Brosnan et al., 2006), participants in this study seemed to focus much more on clinical assessments in practice placements rather than in the university setting. In particular, the regular assessment of aseptic non-touch technique (ANTT) in NHS organisations could be extended to include nursing students in addition to qualified nurses to ensure that skills that may have already been assessed in a simulated environment by OSCE are being maintained throughout the pre-registration programme. None of the participants in this study referred to clinical assessment within the university setting.

It was a positive finding that both students and mentors considered IP&C education to be a joint responsibility between the university and practice placement, with students also identifying their own responsibilities for their learning. However, it was also identified that this ‘joint working’ does not necessarily happen, with theory and practice not necessarily being linked together fully. Henderson (2002) has previously identified that theoretical knowledge gained by students in the university setting is not always transferred to holistic care in practice settings and this may also be the case in IP&C. It is clear, then, that both students and mentors agree that IP&C education is a joint responsibility and that a closer relationship between the two educational settings might facilitate better learning and lead to better practice. This is another area which warrants further investigation. It was also a positive finding that students perceived what was taught by the university to be up to date and relevant. This was also reflected by mentors, though they believed that the university would not be fully aware of all local policies and procedures in different Trusts within the area. The suggested education of students by Trusts when they first arrive there is one way of overcoming this deficit.

Clinical credibility was identified by mentors specifically as something which practitioners had which university staff may not possess. This was felt by mentors to be important both because of the up to date nature of the clinical knowledge and experience of staff and the perception by students of their credibility which may impact on the acceptability of education provided. It has been argued that university lecturers in nursing need to maintain their clinical skills in order to be clinically credible to their students (Fisher, 2005). However, Ousey and Gallagher (2010) argue that the focus of nurse education should not be on ways of establishing credibility in university lecturers but on developing better partnerships between universities and clinical placements in order to better facilitate high quality nurse education. This view is in some respects supported by the students and mentors who participated in this study who talked about education as a joint responsibility between healthcare organisations and academic institutions and about practice skills being taught primarily in practice areas where the expertise is current.

The lack of support for the use of large lectures demonstrated by students in this study echoes previous research. Young Hwang and Kim (2006), for example, identified that students have lower motivation towards learning if taught by lecture in comparison with more interactive approaches, a finding reflected in this study by students identifying a lack of attention in large lectures. The identification of seminars being beneficial in encouraging less confident students to ask questions and interact is an important one in nurse education, whether in relation to IP&C or not, as it supports the need to meet students’ educational preferences and encourage participation from all students. Brown et al. (2003) have identified that confidence building is an important aspect of pre-registration nurse education and have argued that there is little in the literature discussing ways of approaching this. The use of seminars as a teaching approach that may improve levels of confidence in more reserved students is therefore an area worthy of further investigation.

**Study limitations**

This study was undertaken in one university and one NHS Trust in England and does not therefore reflect IP&C education in other institutions and other countries. However, it provides areas for consideration by both educational establishments and practice placement areas who may wish to review their IP&C input to pre-registration nursing programmes. As a qualitative study it also presents the views, opinions and perceptions of participants which do not necessarily reflect the views of those who chose not to participate or of students and mentors within other organisations. However, as the overall aim was to investigate this area within one university and one Trust, this is an accepted limitation of this study. The aim of qualitative research is not to generate data which is generalisable or transferable to other areas or settings but it may act as a basis for future research in this area.

**Conclusion**

This study shows that there may be deficits in the education provided to nursing students in relation to IP&C but that these deficits are perceived differently by students and mentors, with mentors focusing more on theoretical needs to support practice and students highlighting practical skills. It also identifies teaching and learning preferences in particular a preference for small group and interactive learning, and has identified that both students and mentors would approve of assessment in practice as a learning approach in IP&C, specifically in ANTT. This was identified by mentors as something that they undertake within their own practice and therefore recommended for nursing students and which students themselves identified as a way of improving their own practice. Areas for further research have been identified.
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Paper 4
Attitudes towards the Infection Prevention and Control Nurse: an interview study

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Introduction

Pellowe (2007) argues that reducing the risk of patients acquiring an infection as a result of healthcare has become a UK priority. Approximately 50,000 deaths are estimated to occur across Europe every year as a consequence of healthcare-associated infections (HCAIs) (European Centre for Disease Prevention and Control 2007). The World Health Organization estimates that at any one time, 1.4 million people have an HCAI globally (World Health Organization World Alliance for Patient Safety 2005). Therefore, HCAIs are a significant risk within health-care organizations worldwide, with an estimated cost to the National Health...
In order to minimize the risk of HCAIs, standard infection prevention and control (IPC) precautions should be applied to all patients. However, self-reported compliance with such precautions has been identified to be low by several staff groups completing questionnaires, including doctors (Abd Elaziz & Bakr 2009), dentists and dental hygienists (AlNegrish et al. 2008) and nurses and nursing students (Shiao et al. 2002). Previous research has identified that observed practice is considerably worse than self-reported compliance when compared in the same study, and therefore these self-report findings of low levels of compliance are of concern (Nichols & Badger 2008). However, observational studies have reported findings similar to those of questionnaire studies in that observed compliance rates are low among different staff groups (Berhe et al. 2006, Chiang et al. 2008). Many reasons for non-compliance have been identified in the literature, including facilities, time and workload issues, education and staff attitudes (Stein et al. 2003, Ji et al. 2005, Ganczak & Szych 2007).

The Infection Prevention and Control Nurse (IPCN) has an important role to play in the prevention and control of HCAIs (Gould & Brooker 2008). The IPCN is often the only full-time member of the IPC Team and is often the most visible with clinical staff. The Nursing and Midwifery Council (2007) states that nursing students must be able to value the roles of others within the multidisciplinary team. The IPCN is a member of this team as it has been argued that IPC covers all specialities and practices within health care (Gail et al. 2004) and students should therefore learn to value the IPCN role. It is also important that IPCNs are seen as both role models for good clinical practice and effective leaders in driving IPC forward in order to positively influence practice and improve patient safety. It has been identified that nursing leadership behaviours have an impact on nurses’ motivation to perform and this performance is a vital aspect of quality of patient care outcomes (Germain & Cummings 2010). Acting as a positive role model and leader is therefore an important part of the IPCN role.

Nurse managers and clinical nurses play a pivotal role in quality improvement (Price et al. 2007) and IPC is clearly a quality issue. The IPCN may be perceived by nurses as a manager as opposed to a clinician as IPCNs often manage patient care through other nurses rather than being involved in direct patient care (Leela et al. 2005). Price et al. (2007) also identified that quality improvement and its application to practice are perceived differently by nurse managers and clinical nurses. It is therefore clear that the IPCN has an important role in ensuring that quality care is seen as an output of correct IPC procedures and that this is a shared goal of managers and nurses.

Attitudes towards IPC can affect practice both positively and negatively (Stein et al. 2003). While there is limited literature surrounding the effects of attitudes towards IPCNs on staff practice, Green-McKenzie et al. (2001) have highlighted that employee perceptions of management commitment to IPC can affect compliance with IPC precautions. It is therefore possible that perceptions of the IPCN and their commitment to IPC could have an impact on clinical practice. Murphy and McLaws (2001) have also reported a more positive attitude towards IPC recommendations which do not require extra resources at ward level, and in the current economic climate this is a clear consideration for ward managers who wish to provide quality care within finite resources.

**Aim**

The overall aim of the study was to investigate the experiences and education needs of students in relation to IPC in clinical placements as 50% of student time is spent in clinical practice and this is where they learn most of their clinical skills in IPC. This aim was considered to have the goal of increasing understanding and knowledge regarding IPC from both students’ and mentors’ perspectives, illuminating similarities and differences between these perspectives. This paper focuses on one aspect of the study, which was perceptions and views of and attitudes towards the IPCN from both the nursing student and nurse mentor perspectives. This was considered an important aspect to explore given the literature suggesting that attitudes can affect practice in IPC. It was also considered that, as mentors have a large impact on student learning, their attitudes, views and opinions and how these are interpreted by students is important as these attitudes may affect both student learning and the views and opinions of students towards the IPCN. Other aspects of the study are published elsewhere (Ward 2010, 2011).

**Methods**

**Design**

A qualitative exploratory design (Cormack 2000) was used to allow exploration of attitudes and beliefs. Consistent with qualitative methods, sample size was...
not determined in advance and data collection continued until saturation was reached.

Sample
A sample of nursing students and nurse mentors was recruited at one university and one NHS Trust in the north-west of England between January 2009 and July 2010. All students in years two and three on both diploma and degree programmes were invited to participate. Mentors were recruited via the live register between February and July 2010 and invitations were sent to a sample of 75 nurses stratified for area of practice to allow for a wider perspective. Inclusion criteria were set for mentors in that they had to have mentored at least one student in the previous 12 months and be identified as an active mentor on the Trust live register.

Data collection method
Semistructured interviews were conducted at the university and trust sites by the principal investigator. Interviews were undertaken between March 2009 and July 2010, lasted up to 50 minutes and were recorded and transcribed verbatim. An interview guide was used with open questions which provided scope for individual views and opinions which are seen as the basis for attitudes (Table 1). Interviewing continued until data saturation was reached. Data triangulation was utilized in this study using slightly different questions to meet the same objective with the two groups. The advantage of data triangulation in terms of using different people is in the nature and amount of data that is generated and then interpreted (Thurmond 2001). In qualitative research such as this some consider that no single source of data should be considered seriously unless that data can be triangulated (Lincoln & Guba 1985). Triangulation was considered beneficial in this study as its value lies in extending understanding or adding depth or breadth to the phenomena being investigated (Ritchie & Lewis 2003).

Ethical considerations
Ethical approval was gained from the University and local NHS research ethics (University of Manchester 08/1009/NMSW; North West 9 NHS REC 09/H1014/66). Written informed consent was obtained from study participants.

Data analysis
Interview transcripts were analysed using framework analysis (Ritchie et al. 2003; see Table 2). This method of analysis uses a thematic approach and is said by Furber (2010) to allow themes to be developed from both the narratives of those participating in the research and from the research questions initially posed. It includes several stages which involve immersion in the collected data, categorization to produce a framework and modification of the framework as data analysis continues (it therefore allows analysis either during, or at the end of data collection). The method was chosen as a data analysis approach in this study as it is a flexible approach but provides a structured and therefore repeatable procedure for interview transcript analysis (Srivastava & Thomson 2009), improving rigour in the analysis process.

Table 1
Semistructured interview questions

<table>
<thead>
<tr>
<th>Mentor questions</th>
<th>Student questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is your relationship like with your IPCN?</td>
<td>Have you ever met an infection control nurse?</td>
</tr>
<tr>
<td>What do you think about your IPCN?</td>
<td>If yes, what was the meeting about?</td>
</tr>
<tr>
<td>What are attitudes on your unit like towards the IPCN?</td>
<td>What is your opinion of the IPCN?</td>
</tr>
<tr>
<td>Do you think practices change in any way when the IPCN comes to the ward?</td>
<td>What are the attitudes of the staff you’ve worked with towards the IPCN?</td>
</tr>
<tr>
<td></td>
<td>What do they say about him/her?</td>
</tr>
<tr>
<td></td>
<td>Does anything change on the ward when the IPCN visits?</td>
</tr>
</tbody>
</table>

IPCN, Infection Prevention and Control Nurse.

Rigour
Interview transcripts were sent to participants to check for accuracy. Following coding, information on the codes and themes identified was sent to a sample of participants to ensure that they agreed their representativeness. To improve rigour in coding of themes, the principal investigator looked at all transcripts and an additional three researchers from the Framework Group within the university were involved in the analysis of a sample of transcripts.

Results
A total of 31 nursing students and 32 mentors were interviewed. Of the students, 17 were in their second year of study and 14 in their third year; two were male and 29 were female. Of the mentors, years of experience in mentorship ranged between 1 year and 15 years, and
the number of students mentored by each nurse ranged from two to over 40. Three themes emerged relating to attitudes towards the IPCN and the work of the IPCN: views of the IPCN expressed by students and mentors, the observed and experienced effects of the presence of the IPCN and preferred qualities in the IPCN. In the quotes used, S denotes student and M denotes mentor.

Views of the IPCN – student and mentor perceptions

Several of the students had met IPCNs, or had been present when they visited their practice placements. Those who had met them were asked their opinions of the IPCN themselves and what they considered to be the attitudes of ward staff towards them in order to consider both their own views of the IPCN and the views and opinions they perceived their mentors to have. Those students who had not met an IPCN were asked if staff that they worked with ever talked about the IPCN and if so, what the views of these staff were of the IPCN. Students’ views of the opinions of others was considered important in terms of learning as attitudes can affect both learning and practice. Students reported many opinions expressed both from personal experience and from comments made by qualified staff to them during their placement experiences. In particular, there was a perception of fear and threat associated with IPCNs that students themselves perceived on meeting or interacting with an IPCN.

‘You do get some infection control nurses and think “Oh my God I’m terrified” and you do hear that sort of attitude “have you washed your hands?” and I’m thinking “oh my God”’. [S25]

Other students commented on the fear of being told by the IPCN that their practice was inadequate.

‘It’s a fear thing. The infection control nurse coming at you “you’re doing that wrong!”’. [S24]

There was also a belief among students who had interacted with IPCNs that the advice provided by some IPCNs was impractical.

‘They would sort of come round saying “oh, your sink is in the wrong place” and it’s like, “well, what are we supposed to do about that?”’. [S20]

IPCNs were also considered by student nurses, based on what they had observed in practice and discussed with qualified staff, to increase workload and were therefore sometimes viewed as an inconvenience by both qualified nurses and students. Students did believe that staff were aware of the importance of specific procedures and seeking advice but there was a negative attitude towards some aspects related to the advice.

‘I think they [nurses] find them [IPCNs] a bit of a pain because… they keep moving patients around and that means constantly cleaning and having to move stuff, throw stuff away, a waste of money… I think they do understand the reason for it but they don’t like it very much’. [S13]

There was also a perception by students, based on what had been observed in practice, that ward managers felt that their authority was being challenged by the IPCN.

‘It’s like, “I’m the ward manager and this is my ward. Who are you to come on here and tell me?” I see a lot of… confrontation and a lot of… behind each other’s backs, a lot of bad things being said…’. [S16]

Doctors were also identified to have a negative attitude and were overheard making remarks about what the IPCN had said to them and their response to it.

‘And he was calling her [the IPCN] all these names… what a monster she was… just the way they spoke about her was really derogatory’. [S16]
A common perception expressed by mentors was that IPCNs only visited to criticize.

‘They’re always picking on something, we’re never right as far as they’re concerned – one problem after another. When they come you think “what are we doing wrong now?” It’s never good news and they never tell us how to address the problems’. [M13]

Within the Trust, IPCNs rotated and covered more than one area. Mentors had varying views about different IPCNs. Some mentors reported having a positive relationship with their IPCN.

‘Yes, we get on well with her and she’s always very helpful so we can always ring her when we need to and we’re happy to do that’. [M12]

In summary, IPCNs are often perceived by qualified staff in a negative fashion and nursing students observed these attitudes in practice. The IPCNs are often seen by students to invoke fear reactions and by both nurses and students to provide impractical advice, increase workload and be overly critical while also challenging the authority of ward managers. However, some mentors viewed their IPCN positively and saw them as helpful and approachable.

The observed and experienced effects of the presence of the IPCN

There was an overall perception from students that practice improved when the IPCN visited based on what they had observed in their clinical placements.

‘I noticed, actually, on the last ward that I was on, that everybody behaved themselves when they were around, and they’d take their rings off’. [S3]

Mentors also identified from experience and personal behaviour that practice improved when the IPCN was present, although some stated that their practice was always of a high standard, which meant that they were always ready for an IPCN visit.

‘Yes, I have to admit, we do wash our hands a bit more when she’s on the ward – a bit naughty really!’ [M22]

‘We like to think on our unit that we’re always ready for her – it’s easier to do what we should all the time than to try to be different when she [the IPCN] visits’ [M9]

Some students expressed frustration that staff could practice good IPC when the IPCN was there but would revert to the usual suboptimal standards afterwards.

‘If you can do that… when Infection Control are going to come up to the ward, you should be doing that all the time, not just for that half an hour’. [S9]

Several students commented on the fact that wards were often warned about audits and that people therefore changed practices which then reverted to usual practice following the audit. Students felt that advance warning meant that the audits were of little value.

‘she went, “This is a hand wash audit. Now wash your hands there, and I will watch you”, and I’m thinking, “Well, if you’re going to do that, people are going to do it correctly”, and then she was going after some doctors to do the same, and I thought, “Well, they’re going to wash their hands correctly. She’s not going to find out who it is who’s doing what.”’…’. [S4]

‘The point is… to see what you’re doing on a normal day, but there will be signs everywhere saying… ‘There will be infection control day today’, or whatever it’s called, and, ‘Make sure you use a hand gel before…’ Now, why … warn somebody they’re coming round?’ [S15]

Some mentors highlighted the benefits of audits carried out without prior knowledge.

‘people aren’t aware that the audits are going on… so it does actually give you a realistic view… so we can see whether our practices are improving or our standards are dropping and then if the standards start to drop then that information’s… given back to the unit and education’s put into place… so that we can actually improve’. [M5]

Negative feedback from audits also did not necessarily improve practice.

‘I guess they check certain nurses hands, and she [the mentor] said every time she’s been checked, she’s failed, and she’s said, herself, she forgets to wash her hands… but then I’ve noticed she also forgets to wear gloves’. [S9]

Students also identified a negative attitude by staff towards educational updates based on what they had heard staff say about them. Staff described IPC updates to students as repetitive and boring.
‘just like sitting in training sessions for a day, they’re so boring, you don’t want to go to them’. [S19]

‘You get people going “oh God, another infection control lecture on handwashing”!...’. [S25]

Students were more positive in their own personal views of education, stating that a reminder of good practice was always of value and that, despite staff saying that they already knew how to do these things, their practice in clinical areas did not always reflect this.

‘You know, it’s a reminder every time.. because I think people do forget and not just about handwashing, but I think the aseptic technique as well’. [S10]

In summary, the presence of the IPCN in a ward area was seen to improve practice, although this often returned to usual practice after the visit. Audits were considered unhelpful if warnings were given in advance and as more useful in improving practice if staff were unaware of being observed. Infection prevention and control education was described as repetitive and often uninteresting but students saw the value in regular practice reminders.

Preferred qualities in IPCNs

Several students expressed the opinion that the type of approach that the IPCN adopted and what type of relationship she/he had with staff was important in gaining cooperation and support. There were also comments about the differences in reactions that might occur in response to the IPCN’s approach.

‘If they come in with a good attitude that they’re trying to work with the team to improve it and make it a more positive environment, then that works quite well. But I think sometimes they can come in and they can be quite sort of... authoritative, and people feel like they’re being judged, and I think it’s like in any area of nursing, you feel like you’re being judged and you’re going to be reprimanded for it, and you’re more likely to try and hide and not be open, and I think that’s quite dangerous in itself really’. [S17]

Students also stated that IPCNs were seen as more approachable if they made regular visits to clinical areas to offer help and advice.

‘If... they’ve got a problem on the ward, they don’t think they’re going to be reprimanded and... their [IPCNs’] faces are seen a lot as well, because they do rounds, so.. you know, people get to know them and see them’. [S20]

Mentors who had a positive relationship with the IPCN identified what qualities that IPCN had.

‘She... gives helpful advice, I think she works with us rather than against us, which we haven’t always had. Like, “this is the problem and this is what we can do about it”...’.

[M29]

Those who were less positive identified why, while making recommendations for improvement in order to build a more effective relationship.

‘She has a very negative attitude towards us, I think – she needs to tell us what’s good occasionally instead of always beating us with a stick – “this is wrong, that’s rubbish”. You just stop listening after a while’. [M15]

However, the views of some students towards IPCNs were negative because of their own experiences. Some students, for example, admitted to improving their practice when the IPCN was on the ward, despite identifying this as a futile exercise if practice did not remain as good when the IPCN was not present.

‘Yes, I have done that myself, made sure I’ve done things properly when I know she is [the IPCN] coming so I suppose I’m just as bad as the staff on the ward!’ [S30]

In summary, IPCNs who were more approachable, more visible and suggested solutions to identified problems while having a positive attitude towards ward staff were perceived more positively and staff were...
more willing to contact them for advice and communicate with them.

Discussion
Positive leadership is considered a prerequisite in effectively controlling infection (Griffiths et al. 2009) but competing management priorities for staff in ward areas can conflict with good practice in IPC. Infection Prevention and Control Nurses need to secure the engagement of staff in order to drive forward effective plans across health-care organizations (Watterson 2004). From the findings of this study, IPCNs are often considered to be unapproachable and unhelpful by both qualified staff who work with nursing students and by nursing students themselves. This perception was considered to be detrimental to good practice in terms of staff not approaching the IPCN for advice if required. If this perception is correct, this could have clear implications for care quality and patient safety when more positive workplace leadership can, according to Marriner-Tomey (2009), improve care quality.

Venbergh et al. (2002) have reported that perceptions of the IPCN are important as they can have a positive impact on infection rates if the IPCN is accepted as a member of the ward team. This is an important issue when the World Health Organization (2011) estimates a Europe-wide direct cost of €7 billion annually associated with HCAI; in the USA, there is an estimated annual cost of $6.5 billion. Acceptance of and collaboration with the IPCN can reduce infection rates and costs to health-care organizations. While this study did not consider infection rates, it does suggest a lack of acceptance of the IPCN as part of the team; this means that there is less collaboration, which has the potential to affect both practice and infection. It has been highlighted that one of the problems faced by many IPC teams is being able to secure the engagement of staff when faced with so many other targets and priorities (Watterson 2004) and it is therefore important that the IPCN engages staff in a way that promotes improvements in practice. It is a part of the IPCN’s role to act as a liaison between different wards and departments in order to unify policies (Leela et al. 2005) and this may be difficult if they are unable to foster positive relationships with clinical staff.

The fear of IPCNs verbalized by nursing students is of concern if this continues when they are qualified as this may prevent them seeking advice. This could consequently have a negative effect on patient care and outcomes if appropriate advice is not sought and practices are affected. As team morale can be linked to patient outcomes (Griffiths et al. 2009), it is important that staff can work together in a positive and helpful way. Such an interprofessional approach can support improvements in quality and safety (Tezak et al. 2009). The facilitation of positive relationships by nurse leaders such as the IPCN can also improve care quality (Wong et al. 2010) and it is therefore important that IPCNs build effective relationships with clinicians. There was, in addition, a perception that IPCNs are always the bearers of criticism. While there is a need for such transactional leadership in terms of intervention with negative feedback when things are not as they should be (Huber 2006), in order to meet targets, it can be argued that the use of a more transformational model of leadership can have a more positive effect on communication and team building (Thyer 2003); this could have more long-term positive effects on practice. It has been identified that transformational leadership styles in nurse leaders such as the IPCN have a positive correlation with perceptions of effectiveness and with satisfaction that staff have with their nurse managers (Casida & Parker 2011). Adopting such a style could therefore enhance the relationship that IPCNs have with staff and improve perceptions of them, which in turn might promote a collaborative working style that enhances practice.

One of the roles of a leader is to focus on quality and patient safety (Tuazon 2009) and both the IPCN and ward manager can work together to improve patient care. Ward managers can do this by accepting and respecting the IPCN and IPCNs can do the same, demonstrating respect for health-care staff as professionals (Thompson 2004) and acknowledging the challenges and limitations that clinical staff face. It was highlighted that some ward managers see the IPCN as someone who might challenge their authority. Griffiths et al. (2009) reported that senior clinical leaders need a highly visible presence with clearly defined roles and responsibilities in order to be effective and it appears that some staff may see these roles as being challenged by the IPCN.

It was perceived that the presence of the IPCN improved practice. Unfortunately, this was considered to be temporary, although one mentor did state that it was worth maintaining good standards at all times in order to be prepared for an IPCN visit. Maintenance of good standards at all times should be the overall aim in IPC. This is an area that needs to be investigated further in order to encourage more lasting positive effects on practice of the IPCN being present or being expected in clinical areas. Some way of channelling this positive effect in the longer term needs to be identified.
The provision of impractical advice was noted by some interviewees. As nurses in a leadership role, IPCNs need to be both creative and flexible in their approach to highlighting problem areas and suggesting achievable solutions in order to both motivate and empower staff (Thompson 2004). In order to be effective, IPC needs to be integrated into the often complicated and related systems within a health-care organization’s management structure (Brannigan et al. 2009) and IPCNs therefore need to work effectively with people at all organizational levels in order to problem solve and identify services that can support each other.

Suggestions were made about qualities that could improve the opinions of the IPCN. Working in a more cooperative manner and assisting staff to meet required targets by providing common-sense advice could build more positive relationships and improve practice in the long-term. Feltner et al. (2008) have argued that effective leaders can promote a satisfying and productive work environment in which other staff can positively contribute to organizational success. Some of the leadership qualities suggested by Feltner et al. (2008) mirror the comments made by participants in this study in terms of collaboration and effective communication. The IPCNs who demonstrated these attributes were viewed more positively. Davies et al. (2006) have identified that leadership is the only significant predictor of nursing staff’s continued and long-term use of guideline recommendations. In order to ensure that IPC policies are adhered to, there is a need for effective leadership by the IPCN. Gifford et al. (2006) identified facilitation of staff through the provision of support, visibility and communication as one of the activities that sustains guideline implementation and use, and this strengthens the view that being an effective communicator and providing support for staff to implement guidelines is the way forward for IPCNs. Parker et al. (2009) have also identified that communication is one of the main challenges that confronts clinicians and suggested that there was a need for nurses to refocus their management styles on staff participation and the building of more effective teams.

It has been reported that the majority of quality improvement plans in IPC focus on areas such as audit and education (Pellowe 2007). The perception in this study that some audits are pointless is an area that needs to be addressed. Audit in IPC can be used as an opportunity to implement change and collaborate with wards and departments (Bryce et al. 2007). However, advance warnings can change practice during that audit which is not necessarily sustained afterwards. This reflects an inaccurate picture of IPC and issues of concern may not be identified. This could be addressed by unannounced audits or greater involvement of ward and department managers in monitoring practice in collaboration with the IPCN. The issue of criticism and the perception of the IPCN always identifying negatives could also be addressed as part of the audit process in terms of feedback which is positive in nature. Clinical audit can be valuable in improving the quality of health care (Patel 2010) and it is important that it is implemented in a way that increases staff motivation to maintain high standards and improve practice. It was clear from this study, however, that audit was not always perceived positively and that the IPCN was often seen as someone who only identifies bad practice.

Mandatory IPC updates, although part of quality improvement in IPC, were often seen as repetitive and this needs to be considered in overall IPC strategies. Pellowe (2007) has argued that ensuring the professional development of all employees of health-care organizations can only be achieved through leaders who raise the profile of IPC. Mandatory IPC updates are one way of both improving knowledge and raising the profile. While attendance at such updates is often seen as the responsibility of clinical staff themselves, it can be argued that it is also the responsibility of managers and leaders within nursing to contribute to effective patient care (Magill-Cuerden 2007). The Care Quality Commission (2010) also identifies a management responsibility in ensuring that staff receive appropriate training in order to comply with essential standards of quality and safety. Education in IPC is further identified in The Health and Social Care Act 2008 (Department of Health 2009) but it is clear that the type of education provided is seen as superfluous if it is repetitive and staff gain nothing from it. It has been suggested that education should be based on a needs assessment to ensure that its provision is of value and meets the requirements of staff (Knapp et al. 2008). Previous research has also demonstrated that, while education increases knowledge of IPC, this knowledge is not always translated into practice (Santana et al. 2008). This is another area to consider when planning mandatory IPC updates for health-care staff. Investment in staff development is vital for the nursing profession if it wishes to move forward in the current era of change in health-care delivery (Joyce & Cowman 2007). However, it is important that this is not a wasted investment and that education is meaningful and has an impact on practice in IPC and which in turn should lead to improvements in the quality and safety of care.
**Limitations**

The findings illustrated in this study should be interpreted in light of limitations. The samples of students and mentors were drawn from one large university and one large NHS trust in one area of England and are therefore not necessarily reflective of attitudes towards the IPCN in other organizations. However, implications related to issues such as collaborative working, leadership styles, audit and education can be drawn from the findings and are aspects that should be considered by IPCNs in other health-care settings. Analysis of qualitative data is also often considered to have limitations in terms of individual interpretations of the data (Horsburgh 2003). This limitation was, however, addressed by the use of framework analysis and by the involvement of other staff in the coding process to confirm findings.

There can also be limitations in the use of two sources of data in triangulation in qualitative research. Thurmond (2001), while supporting data triangulation, does highlight that there can be issues of disharmony owing to biases of the interviewer and a lack of insight into why triangulation was used. In this study, there was a clear rationale in terms of data depth in applying triangulation and the interview questions were structured to reduce bias.

**Implications for nursing management**

Infection Prevention and Control Nurses can and do work in a collaborative way with clinical staff according to some interviewees in this study. However, there are those who work less collaboratively and who need to consider how this may affect staff attitudes towards both them and IPC, and how this may affect clinical practice and patient outcomes. Staff nurses expect IPCNs to possess leadership and management skills. These skills are needed to ensure that national and international requirements in terms of patient care quality and reductions in infection rates and costs are met and that clinical staff work with the IPCN towards the same goal. Leadership and management skills can be learned and healthcare organizations that employ IPCNs should consider this when preparing staff for the IPCN role.

Ensuring that IPC audit meets the needs of clinical staff as well as mandatory requirements is vital to ensure that high standards of practice are maintained. Ways of both undertaking and feeding back the results of audits that increase motivational levels in staff and have a positive impact on practice need to be identified and utilized if there is to be any value in undertaking IPC audit. It is clear that identifying possible solutions to any practice issues is important to staff in helping them to achieve compliance targets and in viewing the IPCN as a collaborator in driving quality standards. The provision of audit reports that identify what action can be taken and who can assist with this action might be a positive way forward in both highlighting audit as a quality improvement initiative and in fostering collaborative working.

Education is seen internationally as an important aspect of an overall IPC strategy, as demonstrated by its inclusion in many national strategy documents (NHMRC 2010, Department of Health 2009, US Department of Health and Human Services 2009) and anything that threatens its implementation and value is something that needs to be addressed. As the nursing leader in IPC, the IPCN needs to consider how education is delivered and whether it meets staff needs in order to ensure that it is relevant, valuable and has a positive impact on clinical practice for the benefit of patients. With education being considered of such global importance, it is an aspect that IPCNs need to invest time in and deliver in a more motivational and inspiring way, both to enhance attitudes towards IPC and to improve patient outcomes.

More research is needed into the impact that staff attitudes towards the IPCN can have on practice and student learning in order to assess whether this is a global issue that needs to be considered alongside the need for reductions in healthcare-associated infection. Research of a quantitative nature might also be valuable in measuring indicators of attitudes and their impact on observed practice in IPC.

**Conclusion**

The present study expands the knowledge of attitudes towards the IPCN and how this might affect clinical practice, perceptions of IPC and student learning. In order to improve relationships with ward staff, IPCNs can work in a more collaborative fashion, provide more practical advice and make regular contact with clinical areas. In this study, some IPCNs were identified as demonstrating these behaviours and this appeared to foster a more positive attitude towards both the IPCN and IPC, which could in turn improve levels of compliance (Stein et al. 2003). There is currently in health care an environment of diminishing resources and this places pressure on providers to improve patient outcomes while lowering costs (Stanley et al. 2008). By being effective managers and leaders, IPCNs can assist...
in this endeavour, helping to ensure safe and effective clinical practice through education, clinical audit and the provision of advice and support (Jones 2008). Addressing the ways in which audit and education are undertaken may also improve relationships and promote a more positive attitude towards IPC as a whole.

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Paper 5
Attitudes towards infection prevention and control: an interview study with nursing students and nurse mentors

Deborah Jane Ward

ABSTRACT
Background: Despite both national and international recommendations for good practice in infection prevention and control (IPC), compliance can be low. Several reasons for this have been identified, including staff attitudes. There is little literature on how these attitudes are perceived by nursing students learning in clinical placements, and this study was undertaken to explore perceptions of both nursing students and their mentors in relation to attitudes towards IPC.

Methods: Qualitative study involving semi-structured interviews with 31 nursing students and 32 nurse mentors recruited from one large university and one large NHS Trust in the North of England.

Results: Nursing students generally perceived a negative attitude towards IPC from qualified staff and identified that it was considered to be an additional workload burden as opposed to an integral aspect of patient safety and quality care. Mentors identified more positive attitudes within their areas and organisation, but their comments did not always reflect this. Mentors were more of the opinion that staff attitudes could affect student practice and learning than were students.

Discussion: Nurses in practice need to be more aware of how their attitudes towards IPC can be perceived by nursing students and the possible consequences of this for student learning and practice. Staff need to work towards identifying barriers to good infection prevention practice and ways to overcome these.

INTRODUCTION AND BACKGROUND
The prevention of healthcare-associated infections (HCAIs) has become a priority worldwide. Approximately 50 000 deaths are estimated to occur annually across Europe as a consequence of such infections.\(^1\) The WHO estimates that, at any one time, 1.4 million people have an HCAI globally.\(^2\) HCAIs are therefore a significant risk in healthcare organisations worldwide and they remain a global patient safety issue.\(^3\)

A recent emphasis on infections such as Clostridium difficile and meticillin-resistant Staphylococcus aureus (MRSA) in the UK has reinforced the need for more action in infection prevention and control (IPC) in order to ensure that patients receive high-quality care.\(^4\) Flanagan\(^5\) has argued that the provision of more robust IPC measures within UK healthcare providers has become an even bigger priority following the introduction of both the Care Quality Commission and the Health and Social Care Act 2008.\(^6\) It has also been argued that programmes within IPC were among the first efforts in an organised structure that aimed to improve the quality of healthcare delivered to patients.\(^7\)

In order to minimise the risk of HCAIs, standard IPC precautions should be applied to all patients. However, compliance has been shown to be low for several such precautions including hand hygiene,\(^8\) the use of gloves,\(^9\) and sharps management.\(^10\) Many reasons for non-compliance have been identified, including facilities, time and workload issues, knowledge and education, and staff attitudes towards IPC.\(^11\)–\(^14\)

It has been argued that there needs to be a robust approach to the IPC education of nursing students in the UK in both the university and clinical practice setting.\(^4\) The practice setting is of particular importance in nurse education, as students in the UK spend 50% of their 3-year pre-registration programme in practice placements, and this is where they gain most of their clinical skills. The Nursing and Midwifery Council,\(^15\) in their essential skills clusters for pre-registration nursing education, stated that students must, in order to register as qualified nurses, be able to demonstrate achievement of specific skills and behaviours. These include
acting as an effective role model and adhering to IPC policies at all times, while ensuring that colleagues do the same. Surprisingly, given that both education and attitudes can affect practice both positively and negatively,16 17 there is little in the literature about how attitudes towards IPC in practice placement settings that educate nursing students could affect their learning. Jenner et al18 reported that exposure to suboptimal practice in hand hygiene had an adverse effect on the attitudes of student nurses towards hand hygiene, but they did not discuss how this affected practice or learning in students. This paper reports on one aspect of a research study involving nursing students and nurse mentors which aimed to investigate their experiences of IPC in clinical placements19 20; this aspect is attitudes towards IPC.

THE STUDY

Aim/objectives
The study aimed to explore attitudes towards IPC as perceived by both nursing students and the nurses who mentor and assess students in their clinical placements.

Methods
A qualitative study design was used to allow in-depth exploration of attitudes and beliefs. This design was chosen, as it is appropriate for studies where there is very little previous literature.21

Sample
The study occurred at the largest Trust used by the university for clinical placements for nursing students. This Trust has exceeded requirements for performance targets in relation to reductions in MRSA and C difficile and has reported improvements in audit scores in both hand hygiene compliance and aseptic non-touch technique performance and is therefore considered to have good IPC standards locally. All students in years 2 and 3 from both diploma and degree programmes were invited to participate (~600 students). The resultant sample was a non-probability voluntary sample, as students who volunteered were interviewed until theoretical saturation was reached. Nurses who had mentored students in the preceding 12 months were recruited via the live register maintained by each NHS Trust to meet NMC standards. Invitations were sent to a sample stratified by clinical area of practice and the four hospitals within the Trust with a total of 75 mentors being invited to participate. In keeping with qualitative approaches, sample size was not decided in advance and a specific response rate was not required. The mentors’ experience as qualified mentors ranged from 1 to over 40. All had a teaching/mentorship qualification, as this is a requirement to act as a mentor locally. Two mentors had previously undertaken an IPC qualification at the university. The majority were qualified to diploma degrees, but eight participants held bachelor degrees.

Data collection method
Semi-structured interviews were conducted at the university (for nursing students) and Trust sites (for mentors) by the principal investigator (PI). Interviews lasted up to 50 min and were audio recorded and transcribed verbatim. An interview guide (box 1) with open questions was used, which provided scope for individual views and opinions. Semi-structured interviews were used, as they are useful for addressing research aims and objectives that are based on perceptions, views and experiences.22 The PI was a lecturer at the university involved in the study, and, although she had not previously met any of the mentors interviewed, some of the students had been taught by her. The role of the PI as researcher as opposed to lecturer in this study was therefore emphasised, and students were informed both verbally and in writing that they could withdraw at any time or choose not to participate without this affecting their studies in any way. Interviews continued with both students and mentors until theoretical saturation was reached.

Research ethics and governance
Ethics approval for the study was gained from the relevant university and NHS committees and research governance approval was gained from the NHS Trust.

Box 1 Interview guide (M denotes mentor, S denotes student)

<table>
<thead>
<tr>
<th>Question</th>
<th>Mdenotes mentor, S denotes student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why do you think people don’t always do what they should in IPC? (S&amp;M)</td>
<td></td>
</tr>
<tr>
<td>What is the staff’s attitude generally towards IPC in the placements that you’ve had? (S)</td>
<td></td>
</tr>
<tr>
<td>What’s the general overall perception of IPC within the NHS? (S)</td>
<td></td>
</tr>
<tr>
<td>How has your practice changed during the time you’ve been on the course? (S)</td>
<td></td>
</tr>
<tr>
<td>Have you ever changed your practice on a placement to something different to what you would normally do, and, if so, why did you do that? (S)</td>
<td></td>
</tr>
<tr>
<td>What do you think the attitude is towards IPC in the area in which you work? (M)</td>
<td></td>
</tr>
<tr>
<td>What do you think the overall attitude is towards IPC in your organisation? (M)</td>
<td></td>
</tr>
<tr>
<td>Do you think attitudes towards IPC demonstrated by qualified nurses could have any effect on student learning, and, if so, what do you think these effects are? (M)</td>
<td></td>
</tr>
</tbody>
</table>
involved in the study. Written, informed consent was obtained from all study participants. Anonymity was preserved through the use of identification numbers, and care was taken to ensure that neither participants nor others could be identified in data extracts. It was identified that there was the potential for coercion among students who knew and had been taught by the interviewer. This was addressed by an invitation email being sent out to whole cohorts of students with the information leaflet attached, so that only students who volunteered were directly contacted by the interviewer. Participants were also made aware that the choice to not participate or to withdraw from the study at any point would not affect their studies in any way. This information was provided both verbally and in writing on the consent form. Some of the students had been taught by the interviewer and others had not, and students were asked to be as honest as possible. It was also ensured that participants were aware that the interviewer was seeing them in her role as researcher as opposed to lecturer in order to separate the two roles in the minds of the students.

Data analysis
Interview transcripts were thematically analysed using the framework analysis method. This method consists of the following stages:

- Familiarisation
- Identification of a thematic framework
- Indexing
- Charting
- Mapping and interpretation

This approach to qualitative data analysis is systematic while being flexible and enables retrieval of data to show to others, so that each step of the analysis process can be demonstrated and scrutinised if necessary.

Rigour
After transcription, interview transcripts were sent to participants to check for accuracy. After coding, information on the codes and themes identified was sent to a sample of participants to ensure that they agreed with the authenticity of the codes and themes. To improve rigour in coding of themes, the PI looked at all transcripts, and an additional three researchers from the Framework Analysis Group in the study university who were not involved with data collection were involved in the analysis of a sample of transcripts. No changes were made to the themes as a result of these processes.

RESULTS

A total of 31 nursing students (table 1) and 32 nurse mentors were interviewed. Of the nurse mentors, six were male and 26 female, and years of experience as mentors ranged from 1 to 15. The number of students mentored by each qualified participant during their years as a mentor ranged between two and over 40. Across the four hospitals in the Trust from which participants were invited, three hospitals were represented. A variety of placement areas were represented by the nurse mentors and nursing students (box 2). In the data extracts used, S represents student and M represents mentor. Several themes emerged from the data (table 2).

a) Staff attitudes as perceived by nursing students

Although some students reported positive attitudes toward IPC in some of their practice placements, the general overall attitude was perceived to be negative, with IPC being perceived to be seen by qualified staff as an additional workload burden rather than a vital and integral aspect of patient care:

Overall I think it’s quite negative, just in that it’s seen as more of a chore than a routine or a duty of care S16
I think some people see it as a ‘Oh, if we have to do it’ sort of thing, rather than thinking ‘We should be doing this as part of our routine’ S26

Students who perceived there to be a positive attitude towards IPC in their placement areas stated this to be in part due to the media focus on specific infections:

I think people see it quite highly actually. There’s … quite high profile now… what with MRSA and … C.diff, and it being in the media and in the public eye S19

Table 1 Characteristics of participating students

<table>
<thead>
<tr>
<th>Programme</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree</td>
<td>8</td>
<td>8</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>Diploma</td>
<td>9</td>
<td>6</td>
<td>0</td>
<td>15</td>
</tr>
</tbody>
</table>

Box 2 Placement areas represented by participants

<table>
<thead>
<tr>
<th>Mentors</th>
<th>Medicine</th>
<th>Surgery</th>
<th>Outpatients</th>
<th>Acute care (including critical care areas)</th>
<th>Ophthalmics</th>
<th>Paediatrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>Medicine</td>
<td>Surgery</td>
<td>Outpatients</td>
<td>Critical care areas</td>
<td>Theatres</td>
<td>Primary care</td>
</tr>
</tbody>
</table>


303
The attitude of doctors was specifically mentioned by students as being particularly negative, with one student identifying a conversation between a ward sister and a consultant:

one comment I heard was I can either “... practice infection control or I can treat the patients, you choose”. S12

This identifies a perception of not being able to practice good IPC in addition to other duties, again suggesting that infection control is seen to be an additional duty rather than an integral part of patient care and management.

Students identified that staff were aware when their practice was suboptimal, but they had a sometimes dismissive attitude to their practice:

They realised they shouldn’t have done it and then just went ... ‘Oh, never mind’ so that’s pretty disgusting. S19

Nursing student participants were clear about their perceptions of staff attitudes towards IPC and could identify them as positive or negative. None of the students interviewed reported allowing the attitudes of other staff to affect their own view of IPC.

Mentor views of student attitudes towards IPC

Some mentors felt that students entered practice placements with unrealistic expectations about standards of care without considering barriers, such as time, workload and skill mix, that might adversely affect practice:

It’s all very well but they expect too much infection control-wise.... They come from university with these big ideas about what practice should be like but the reality is different, we don’t always have the time or the staff to do everything right. Students need to appreciate that and be taught to have realistic ideas about practice before they come to us M2

Students were, however, complimented on their practices and knowledge of IPC and their positive attitudes:

I’ve found the students to have a good knowledge about the basic infection control standards when they come to us. Their practices seem okay and they’re always quick to respond if we point something out that isn’t quite right M6

However, in some cases, students’ practices were seen as slow and therefore time consuming. Mentors sometimes perceived there to be time constraints and believed that certain procedures should be undertaken more quickly, even if this meant that corners may have to be cut in IPC practice:

They do tend to be rather slow, to slow us down when we have a lot to do and we can’t keep stopping to tell them what to do and how to do it, we have things to do M23

This mentor view was echoed by a student who described a conversation with her mentor:

she said that aseptic technique was very important but sometimes you have to cut corners S4

c) Mentor views of attitudes towards IPC in their clinical area

Some mentor comments echoed those stated by students about IPC being an additional extra, rather than integral to care:

Of course infection control is important but you have to realise that you can only do so much in a shift and sometimes infection control just takes too much time so you have to relax standards a bit M4

Despite what could be perceived as negative comments being made during interviews, however, when mentors were specifically asked for their opinion of the attitude towards IPC within both their clinical area and their organisation as a whole, it was generally stated to be positive:

<table>
<thead>
<tr>
<th>Theme</th>
<th>Example quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff attitudes as perceived by nursing students</td>
<td>I think it’s really good. I think it’s become a really good integral part of care now, and people don’t really think twice about keeping things clean (S14) On some wards, there’s a bit of an attitude towards it, a bad attitude towards it (S23) That it’s quite annoying, you know, that you haven’t got time for it, that’s the big thing, people just say they haven’t got time for it (S25)</td>
</tr>
<tr>
<td>Mentor views of student attitudes towards IPC</td>
<td>They generally do have quite a positive attitude—I think university gives them that so they see it as important when they get here (M30) I think they get a bit of a shock when they come out—it’s not like they get told in uni so they expect something that isn’t reality, really, in infection control. We can’t always do what we should but students expect us to (M23) It’s good in this Trust, the people at the top support it which gives the right message then to the rest of the staff (M30)</td>
</tr>
<tr>
<td>Mentor views of attitudes towards IPC in their clinical area</td>
<td></td>
</tr>
</tbody>
</table>

Table 2  Themes with indicative quotes
It’s very positive I think, here and the Trust, because it’s
a national priority, isn’t it? It’s in the news a lot so we have
to make sure that we do everything that we should,
patients expect that M30

This echoes the influence of the media previously
referred to by students. The view of a positive attitude
within the Trust could also be confirmed by the fact that
facilities in the organisation were not identified by staff
as a reason for non-compliance with IPC precautions in
terms of lack of availability.

Qualified staff were asked how they thought attitudes
towards IPC impacted on student learning in their clinical
area. Some commented on how a positive attitude
might positively influence students:

We have targets to meet and I think that… them seeing us
striving to do that … I think it might actually have an
impact on them and improve their infection control as
well M5

Others talked about how negative attitudes towards
IPC could affect students:

I think negative attitudes could make a big difference -
things like that can rub off. If we are complaining about it
and students see that, they might think that’s okay, that
infection control is a pain and maybe not that important.
I’ve never stopped to think about it before but it could
have an impact on what students learn from their mentor
M16

DISCUSSION

This study identifies that student nurses enter clinical
practice placements with a generally positive attitude
towards IPC and that, despite often being exposed to
negative attitudes from qualified nurses, they seem to
maintain their positivity. This is important in terms of
continuing positive attitudes once qualified in order to
support good practice.

Mentors themselves confirmed that students have
a positive attitude. However, many qualified nurses
demonstrate negative attitudes. IPC precautions are
often seen as time consuming and inconvenient, despite
their value in preventing infection and improving
patient safety and outcomes. These findings are impor-
tant, as attitudes towards IPC have previously been
demonstrated to affect practice. 16 17 There seemed to be
contradictions in the perceptions and views of mentors
who stated that their attitude towards IPC was positive,
but made remarks that could be, and indeed were,
perceived by students to be negative. This suggests that
perception and reality may be different and that there
may not be a realisation among some staff that negative
comments relating to IPC could be perceived by others
as reflecting a negative attitude towards it. A recom-
mandation for practice therefore emerges from this
study in relation to mentors ensuring that their com-
ments to students reflect the importance of IPC and
the need for a more positive attitude towards it. Staff
can do this by considering how their own views and attitudes
may affect student learning, student practice, and the
IPC practices of future nurses.

The identification by mentors of unrealistic expecta-
tions from students who do not consider the barriers to
good practice which are a constant challenge in health-
care settings is a reflection of the literature relating to
non-compliance with IPC precautions previously
discussed. Factors that affect compliance may therefore
also need to be considered as issues that can affect staff
attitudes to their students and therefore possibly student
learning and their view of their clinical placement
experience. This clearly needs to be acknowledgement
by nurse mentors that, while there are barriers to good
practice, nurses and nursing students should be working
with other healthcare professionals to identify and
minimise these rather than accepting them as constants
that will always adversely affect standards of care. This
study contributes to the need for this through its iden-
tification of how the acceptance of poor practice as ‘the
norm’ can influence the perceptions and views of
student nurses. One of the indicators of future behav-
our is the intention to perform this behaviour. This can
be influenced by factors such as the views of other staff,
attitudes and other barriers to performing the behav-
our, in this case IPC precautions.

Negative attitudes towards what is an integral aspect of
quality care is an important factor for nursing students,
as negative attitudes can adversely affect learning. 24

Although students in this study did not themselves
perceive an impact on their learning related to the atti-
attitudes of staff, mentors were of the opinion that staff
attitudes may have both positive and negative effects on
student learning. It has previously been reported that
the single most important influence on the learning of
student nurses is the registered nurses with whom they
work on a day-to-day basis. 25 It is therefore possible that
the attitudes of staff towards IPC can have an overall
impact on what nursing students learn about IPC and
how they themselves view it in the future. Nurses need to
be aware of the impact that their own attitudes can have
on students and their clinical practices and learning in
practice placements. As nurse mentors in the UK have to
undertake an approved programme of study to register
as mentors, it is worth considering the inclusion in these
programmes of how students perceive attitudes and how
these can affect both learning and practice, so that
mentors are better prepared for this aspect of their
role. It is also worth mentors considering why they
have such negative attitudes and what they can do to improve them, in collaboration with other professionals such as the IPC nurse or practitioner. While mentors may consider their own attitudes and the attitudes of their clinical areas and organisations to be positive, they need to be more aware of how what they say and do in relation to IPC might be perceived to reflect a negative attitude, and endeavour to emphasise the importance of IPC to both patients and staff while identifying possible barriers to good practice that need to be overcome.

Both students and mentors referred to the media as raising the profile of IPC, with mentors also identifying the impact of the media on patient expectations in IPC. It has previously been identified that the main source of information that patients utilise regarding HCAI is the media, and it is therefore positive that participants in this study identified the media as contributing to more positive attitudes towards IPC and possibly being the basis for patient expectations. However, the literature that discusses the misperceptions of media reporting relating to HCAI and the effects that this may have on patients and their experiences also need to be considered, as, while the media may raise the profile of IPC, it may also provide inaccurate and sensationalist information at times that may have a more negative impact. However, HCAI has risen upwards in the policy agenda in the UK in recent years, in part due to its media profile, and this therefore could be considered a positive consequence of the media focus, despite the attitudes of staff still demonstrating negativity towards IPC.

The findings of this study should be interpreted in light of its limitations. This was a qualitative study with a small sample size undertaken in one university and one NHS Trust in England and is therefore not necessarily transferable to nursing students and nurse mentors in other universities and healthcare organisations. The sampling was also voluntary and the perceptions of students who volunteered may not necessarily be the same as those who did not.

Acknowledgements I thank Professor Ann-Louise Caress for her comments on the first draft of this paper.

Funding Funding for this study was provided by the General Nursing Council for England and Wales Trust and the University of Manchester.

Competing interests None.

Ethics approval Ethics approval was provided by the University of Manchester ethics committee and North West 9 NHS REC.

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Data sharing statement Data available on request from the corresponding author.

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Attitudes towards infection prevention and control: an interview study with nursing students and nurse mentors

Deborah Jane Ward

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Paper 6

RESEARCH IN BRIEF

The application of the theory of planned behaviour to infection control research with nursing and midwifery students

Deborah J Ward

Accepted for publication: 23 June 2012

Aims and objectives

The aim of this article is to demonstrate the application of the theory of planned behaviour (TpB) in research about infection prevention and control education in preregistration nursing and midwifery.

Background

The TpB (Ajzen 1985) assumes that human beings are rational, make use of available information and consider the consequences to their actions. It proposes three main aspects that affect an intention to behave in a certain way, such as to comply with infection prevention and control (IPC) precautions: attitudes and beliefs, subjective norms and perceived behavioural control. However, Ajzen (1985) has suggested that the theory is open to additional variables if they have a significant effect on the outcome. It is postulated that intention to perform a behaviour is the most important factor promoting this behaviour. However, it is considered in IPC that there are factors that occur when in practice placements that may change nursing and midwifery students’ initial intention so that they may not perform IPC appropriately (O’Boyle et al. 2001).

Design

This article does not report fully on the studies that collected primary data by semi-structured interviews but instead focuses on the application of the TpB to the findings of the study to demonstrate its applicability to preregistration nursing and midwifery education in terms of students’ intention to perform good practice prior to placements and the factors that impact on both their intention and their actual behaviour.

Methods

Nursing \((n = 31)\) and midwifery \((n = 15)\) students were interviewed using a semi-structured approach about their experiences of IPC in clinical placements (Ward 2010, 2012). All midwives were women with 8 in year 2 of their programme and 7 in year 3. Two nurses were men, the rest women with 17 being in year 2 and 14 in year 3. Once data were analysed, the TpB was applied.

Results

The overall application of the TpB is demonstrated in Fig. 1. It is postulated from this study that the three predictors of intention can be influenced between students being taught in the university and their education in practice placements. This therefore may impact on their intention and in turn their behaviour.

In terms of attitudes and beliefs, information provided prior to practice placements about microbiology and IPC highlights risks and consequences and prevention strategies, providing students with the information that they need on which to base their behaviour. It is also considered that, by beginning a nursing programme, the majority of students wish to provide a high standard of care and minimise risks to their patients. This therefore contributes to positive
beliefs about applying IPC in practice and a positive attitude towards IPC, which increases intention to comply with IPC. However, once in practice, several factors can influence the beliefs and attitudes of the student that may impact on their intention to perform and therefore their behaviour. In the studies undertaken, this included aspects such as the attitudes of staff towards IPC and towards students who complied; the view that one person cannot make a difference, and therefore, if one person does not always comply, it will not have an adverse effect; and the perception that not complying will not have significant negative consequences.

The subjective norm relates to a person’s view of the pressure to perform the behaviour. Prior to placement experience, the media focus can have an impact on this, a factor that was mentioned by study participants (e.g. ‘I think everyone knows how important it is now, like MRSA, because it’s in the media a lot’). There is also the work within the university in clinical skills laboratories where students are taught correct procedures and work with each other to meet the same standards as their peers. Once in practice, qualified staff are seen as role models and teach students clinical practices. However, role models may not always be positive and there can be conflicting practices observed, which students may find confusing.

Students often perceive in practice that they have no real control as they are learning, working in clinical environments which have competing priorities and are concerned about passing their placement experience (e.g. ‘you have to go along with what they do, even if it’s wrong so you fit in and aren’t seen as a trouble causer’). This mirrors closely Melia’s (1987) work on socialisation in the occupation of nursing and the issue of students mirroring what qualified staff do to ‘fit in’, even if this means demonstrating inappropriate practices. Therefore, while they may consider in university that applying IPC will be easy and that equipment will be readily available, the reality of clinical environments affects their control over the situation. This may be due to factors such as time, workload demands and competing priorities such as emergency situations where taking time to apply gloves, for example, may have to be balanced with delaying life-saving actions. These factors can change the control beliefs of students about resources available and obstacles to implementing IPC.

What the application of TPB demonstrates here is that the intention to perform IPC in clinical placements can change and be influenced by factors at different stages. Figure 1 also demonstrates that, while there are influences that may impact negatively on intention, there are still the initial factors that first informed students’ intentions to
perform IPC. For example, while negative attitudes of staff towards IPC and the view that one person not complying will not make a difference may affect students, the student still has the initial education and knowledge provided by the university on which to base their own decisions about performing IPC. This highlights the multi-faceted nature of compliance and non-compliance with IPC both in qualified and student practitioners. This needs to be considered in nursing and midwifery education as both university and clinical placements have an equal partnership in educating the practitioners of the future.

Conclusion and relevance to clinical practice

The TpB provided a systematic framework with which to consider the factors that may impact on student behaviour in IPC in their clinical placements. There is a large body of research that considers rates of compliance with IPC precautions and reasons for non-compliance in qualified staff, but as the qualified health care practitioners of the future, nursing and midwifery student compliance and factors which affect these need to be considered. The TpB may be one way to approach this in future research and education programmes so that practice can be improved, and risks to patients can be minimised.

Key words

infection prevention, preregistration education, theory of planned behaviour

Conflict of interest

The authors declare that they have no conflict of interests.

References

Paper 7
The barriers and motivators to learning infection control in clinical placements: Interviews with midwifery students

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A R T I C L E   I N F O

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Keywords:
Practice placements
Education
Infection prevention
Midwifery
Barriers

S U M M A R Y

Aim: To investigate the barriers to and motivators for learning infection prevention and control as identified by midwifery students.

Methods: Semi-structured interviews were undertaken with 15 undergraduate midwifery students within one large university. Data were analysed using Framework Analysis.

Results: Barriers to good clinical practice were identified by students which were concordant with previous literature related to reasons for non-compliance with infection control precautions. Issues such as competing demands specific to midwifery were also identified. Factors which act as barriers to learning good practice in placements included conflicting information and practices from different staff and placement areas and staff attitudes towards students who tried to comply with precautions. Motivators to good practice included the perceived vulnerability of infants to infection, the role modelling of good practice to new mothers and the monitoring of practice.

Conclusions: This study demonstrated that midwifery students perceive barriers and motivators to learning infection prevention and control in their clinical placements. Many of the barriers identified are related to the attitudes and practices of qualified staff. Some of the motivators are related specifically to midwifery practice. Midwives need to be aware of the effects of what is observed in practice on midwifery students and how their practices and attitudes can influence learning both positively and negatively. As healthcare-associated infection and poor compliance with precautions are a global problem, this research should be of benefit to midwives and midwifery educators worldwide in terms of addressing barriers and ensuring better clinical education.

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Introduction

It is estimated that around 8.2% of patients acquire infections as a result of healthcare interventions in the UK (National Audit Office, 2009) and that up to 30% of such infections are preventable by the application of current standard infection prevention and control (IPC) precautions. Compliance with such precautions is therefore vital in minimising the risk of healthcare-associated infection (HCAI). Despite this, compliance with IPC precautions can be sub-optimal world-wide (Gammon et al., 2008), one suggested reason being a lack of education (Rosenthal et al., 2003).

Midwifery students are exposed to occupational risks associated with infection and may themselves be a potential risk to others due to their limited experience and knowledge (Atulomah and Oladepo, 2002). A significant proportion of IPC education is provided in practice placements in the UK and this paper reports on a study of the barriers and motivators to learning good practice in IPC in clinical placements as perceived by midwifery students, an area which should be of interest internationally considering the global nature of HCAI and non-compliance with IPC precautions.

Background

Sub-optimal compliance with IPC has been reported globally in midwifery. Ji et al. (2005) identified that 40% of obstetrics and gynaecology health workers, including midwives, did not comply with hand hygiene in China, while Cutter and Jordan (2003) reported that only 1.5% of study participants (including midwives) adopted standard IPC precautions for all patients. In a study of Traditional Birth Attendants in Nigeria, only 10.7% of staff identified that they wear protective clothing including gloves during births (Bassey et al., 2007). While TBAs are not qualified midwives, it is acknowledged that in some areas of the world, these are the people who assist in the birth of a significant proportion of babies and their practices are therefore relevant in terms of infection risk. Most midwives who participated in a questionnaire study did not implement recommended interventions which could minimise the risk of transmission of HIV from mother to child during birth (Roets et al., 2003). Midwives in the UK, despite recognising the need to use IPC precautions,
do not always adequately protect themselves from blood and other body fluids, citing reasons such as workload and emergency situations (Bott, 1999).

Education has been identified internationally as a part of any IPC strategy (Ward, 2011). In midwifery, Wilson et al. (2005) linked a rise in infections in obstetrics to inadequate training. A lack of knowledge has also been identified as contributing to poor practice (Roets et al., 2003; Bassey et al., 2007). Winani et al. (2007) reported that education in combination with single-use equipment could significantly decrease the risk of developing sepsis or cord infection in Tanzania. Iranian midwives themselves have expressed a need for education to increase their knowledge of IPC (Askarian et al., 2007). Reda et al. (2009) also reported insufficient knowledge of IPC precautions among health care workers, including midwives, in Ethiopia and made recommendations for more intensive training. Training interventions to support maternity care providers have also been recommended by Turan et al. (2008) in relation to HIV/AIDS. Education and training has been reported as contributing to poor practice (Roets et al., 2003; Bassey et al., 2007). Winani et al. (2007) reported that education in this area should however be of value globally in addressing this knowledge deficit in order to improve practice.

Methods

Aims

The aim of this study overall was to investigate the experiences of nursing and midwifery students in relation to IPC in clinical placements, aspects of which are reported elsewhere (Ward, 2010). This paper reports specifically on the barriers to and motivators for learning good IPC in clinical placements as identified by midwifery students during the study as these were issues specific to the midwifery student interviewed and were considered important aspects to investigate due to the lack of research relating to midwifery education in IPC.

Data Collection Methods

A qualitative approach was utilised to explore the views and perceptions of midwifery students (Marshall and Rossman, 2010). Semi-structured interviews allowed for a focused approach to ensure that all research questions were addressed while enabling additional questions for clarification (Wengraf, 2001). Interviews were audio recorded and transcribed verbatim. All interviews were undertaken by the principal investigator at the main university site in 2009 and 2011 and an interview schedule was used (Table 1). Each participant was interviewed once for up to 1 h.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Interview schedule.</th>
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</thead>
<tbody>
<tr>
<td>Why do you think that people don’t always comply with IPC precautions?</td>
<td>Involves reading and re-reading transcripts to become familiar with their contents and identification of initial recurring ideas</td>
</tr>
<tr>
<td>Are there any issues specifically in midwifery that you think stop people from complying with IPC precautions?</td>
<td>Identification of thematic framework</td>
</tr>
<tr>
<td>Is there anything that you’ve seen that helps staff to comply with IPC precautions?</td>
<td>Indexing</td>
</tr>
<tr>
<td>Are there any reasons specific to midwifery that people might comply more or less than in other areas?</td>
<td>Charting</td>
</tr>
<tr>
<td>What do you personally think would make staff comply more?</td>
<td>Mapping and interpretation</td>
</tr>
</tbody>
</table>

Data Analysis

Interview transcripts were analysed using framework analysis (Ritchie et al., 2003), a method of analysis which is now seen as established and rigorous for qualitative data (Furber, 2010). Although it is said to be similar to grounded theory, Srivastava and Thomson (2009) argue that Framework is better adapted to research that involves specific questions and a pre-designed sample such as professional participants. The analysis involved 5 stages (Table 2). Analysis of all transcripts was undertaken by the principal investigator.

Results

Sample

Midwifery students in years 2 and 3 of a pre-registration degree programme were invited to participate in the study. These were chosen to ensure that participants had been exposed to several placements and were therefore able to comment on what had been observed in practice in several different areas. The resulting sample was voluntary. Interviews continued until data saturation was achieved.

Ethics

Research Ethics Committee approval was gained from the University. Interviews were anonymised by allocation of a participant number on transcripts. All personal data which could identify participants, other staff members and clinical placement areas were removed from transcripts.

Sample

A total of 15 midwifery students in years 2 and 3 of their studies, across 4 cohorts were interviewed, 9 in 2009 and 6 in 2011. All were female and all had experienced practice placements in both hospital and community settings including the delivery suite, ante-natal and post-natal wards, community midwifery, an exposure to nursing placement and neonatal intensive care / special care baby unit.

Identified Themes

Three themes emerged from the data; Barriers to good IPC practice, barriers to learning good practice and motivators to learning good practice. Within each of these three themes were sub-themes. (Table 3).

Barriers to Good IPC Practice

Compliance Barriers

Students identified several reasons for clinical staff not complying with IPC precautions including time, workload, facilities, not being prepared, adverse skin effects, laziness and habits forming over time. Some
Table 3
Themes and sub-themes identified from interviews.

<table>
<thead>
<tr>
<th>THEME</th>
<th>Barriers to learning good IPC</th>
<th>Motivators to learning good IPC</th>
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<tbody>
<tr>
<td>SUB-THEMES</td>
<td>Barriers to good IPC practice</td>
<td>• The perceived vulnerability of babies</td>
</tr>
<tr>
<td></td>
<td>• Compliance Barriers</td>
<td>• Units with good standards of practice</td>
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<td></td>
<td>• Lack of knowledge</td>
<td>• The role modeling of good practice to new mothers</td>
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<td>• Complacency</td>
<td>• Having a sound knowledge base prior to practice</td>
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<td>• The belief that one person cannot make a difference</td>
<td>• The monitoring of practice</td>
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<td>• Competing demands</td>
<td>• National information about mortality in pregnancy</td>
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<td>• The current economic climate</td>
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Barriers to Learning good practice
- Knowledge and training prior to placements
- Conflicting advice
- Attitudes of mentors
- Influence of mentors’ practices

of these reasons were those perceived by students and others were reported in terms of what had been seen and heard in practice.

Time was commonly cited as a reason for non-compliance but it was also acknowledged that, though correct procedures in IPC took time, staff did have enough time to do things that would make a difference such as hand hygiene:

if you do do things properly, it might take a bit more time, but I don’t think … I know everyone doesn’t have enough time to do everything, but I think you do have enough time to do them little things that would make the difference M5 (year 2)

In relation to hand hygiene, sore hands were commonly mentioned as a factor inhibiting good practice:

It’s probably laziness, because it can be a bit tedious to wash hands all the time, because ,like, on community we have to wash our hands before and after every person, and with the clinic, your hands get so sore by the end of it, so that might be a reason as well M5 (year 2)

Sharps management practices were also highlighted as an area of unsafe practice due to a lack of preparation of equipment:

she sometimes forgot her sharps box out on the community and would re-sheath it and sort of wrap it up [the needle] .. and she’d go ‘Oh, I’ve forgotten my sharps box’ M4 (year 2)

Lack of knowledge
A lack of knowledge among midwives was suggested by students as a barrier to good practice. It was considered that some staff may not have kept themselves up to date with current research evidence and as a result may demonstrate practices which were no longer considered acceptable:

Some people might not have been taught properly, out of date practices, haven’t had all the up-to-date research M3 (year 2)

Complacency
Some students believed that there was a level of complacency among some midwives. This was seen to be related to a perception of risk measured by consequences to practising in this way in the past. It was considered that not seeing negative consequences to practising in an unacceptable way could promote poor practice:

So I think because it isn’t [the consequences of not practicing good IPC] an instant ‘hold on this is wrong’, whereas if you did something to a woman and it’s an instant, something’s going to happen, then I think … you would find that you would get pulled up about that but because infection control, because it’s not an instant, something’s going to go wrong I think it’s one of the things that people leave out M12 (year 3)

However, it was also emphasised that none of the midwives were malicious in their intent to put mothers and babies at risk:

I think it’s just complacency and not being bothered. I don’t think they’re doing it purposefully to infect somebody with something nasty. M5 (year 2)

The belief that one person cannot make a difference
It was identified by some students that staff may not perceive the impact that they personally can have on infection both because they do not believe that they alone can make a difference by complying and because people never think that things will happen to them or because of them:

I think sometimes people think ‘oh…it’s a small measure’ …you know how you think it’s never going to happen to me….I think people think that it’s not going to happen to them, they’re not going to be the ones that are carrying anything dangerous, they’re not going to be the ones with dangerous bugs on their hands… So people just become blasé because… they think that they’re not going to make a difference M12 (year 3)

Competing Demands
Being busy and having to undertake a lot of activities meant that there were competing demands, particularly if something occurred which students believed could not be foreseen:

I wouldn’t want to deliver a baby without my gloves on and she just came in and she was , well, she was bearing down and I looked and there was the head there and it was either let the baby drop or catch the baby so I think some things you just can’t prepare for M12 (year 3)

There was therefore an element of weighing up risks in having to act quickly in order to decide whether the consequences of delaying action to decontaminate hands or don gloves would be more significant than acting quickly and not performing IPC procedures.

The Economic Climate
Some students interviewed in 2011 stated that the need to cut costs impacted on IPC. It was also perceived that staff may believe that they
were assisting in reducing costs by reusing some items without considering the consequences of their actions in relation to cross-infection:

We’re in an environment where we need to be saving lots of money so they think they’re doing their bit towards the NHS, you know, they can use it [an apron] again M12 (year 3)

Barriers to Learning Good IPC Practice

Several barriers to students learning good IPC practices during their clinical placement experiences were identified.

Knowledge and Training Prior to Placements

Some students stated that they had received inadequate training in some aspects prior to placements and therefore were not always prepared for what they saw, what standards should be implemented and the expectations of staff:

I hadn’t had any formal training in that so I didn’t know how to do it… she [my mentor] expected me to know already but it was my first ward so I’d not done it before M8 (year 3)

Conflicting Advice

Several students identified differing practices which led to confusion regarding what best practice was:

if a woman’s membranes haven’t ruptured when you’re doing a vaginal examination, some people are of the opinion that you don’t need to use sterile gloves if the membranes are intact, whereas some midwives say, “Always use sterile gloves” M5 (year 2)

Attitude of Mentors

Some students felt pressured not to comply with precautions. There was a perceived negativity from staff if students were either considered to be taking too long to complete a task or were seen to fully comply with IPC precautions which qualified staff saw as unnecessary:

it sets a bad example for me… feeling like a bit of a prat, going to… do it all properly and get my gloves and she’s [my mentor] sitting there thinking ‘come on’? M4 (year 2)

In some areas students were ridiculed for wearing protective clothing to reduce their risk of exposure to blood or other body fluids:

I saw a student who insisted on wearing goggles on CDU [delivery suite], and people were talking about her, and laughing at her, and I felt awful M1 (year 2)

The Influence of Mentors’ Practices

Some students identified that they had seen other students change their practices from good to inappropriate on the basis of what they had seen qualified midwives do. This was seen as a barrier to good practice as students began to believe that inappropriate practices were acceptable:

I’ve even seen students not wear gloves and things just because that’s what they’ve seen other members of staff do M13 (year 2)

Motivators to Learning Good IPC Practice in Clinical Placements

Several aspects were identified which improved compliance and facilitated good practice both among midwives and students.

The Perceived Vulnerability of Babies

It was the view of some students that midwives were more careful in their IPC practices with babies as they were perceived to be at higher risk of infection if precautions were not fully implemented:

Everybody’s more particular with a baby… because they’re cute and cuddly and you don’t want them to get an infection… people are more careful M2 (year 2)

Infection risks were generally perceived to pregnant women once their membranes had ruptured but again there was the identification of conflicting practice in this area:

I think then it’s a risk, when the waters have… cos in some areas they wear sterile gloves once they have broken but they don’t on others M10 (year 3)

Units with Good Overall Standards

Students used maternity units that they perceived to have high standards as a benchmark to judge future units and as a baseline for their own practice:

The unit I was on first, the first placement I did in hospital, it was really good so I learnt a lot… I tend to follow what they did now in other areas, even if the staff there don’t do it M8 (year 3)

The role Modelling of Good Practice to New Mothers

Some students identified that acting as a role model to new mothers was a good learning tool as it meant that staff had to practice high standards in order to teach these to their client group:

They make sure the woman sees them washing their hands, they don’t do it outside and then come in. Or they’ll say, “Oh, I’m just going to wash my hands,” you know, so the woman can see. And a lot of the women pick up on the fact that… when you’ve done something with the baby, they should wash their hands themselves, as a mum. M2 (year 2)

Having a sound knowledge base prior to practice

While a lack of knowledge was identified by some as a barrier to IPC, having a theoretical knowledge base was also identified by others as a motivator as it highlighted what current research and national guidelines identified as correct and appropriate practice:

Having the knowledge base before we went out was a good thing because it meant that we had a basis for what we did… you know, we had reasons for what we did M8 (year 3)

Some students also stated that having a clear understanding of the rationale for precautions persuaded them to comply more when compared with policies and guidelines stipulating how things needed to be done without a clear supporting argument or research evidence:

it gives the information about why we’re doing things and …if you got a reason to do something you’re more likely to do it M13 (year 2)

The Monitoring of Practice

Some students suggested that if there were regular checks on standards, staff would maintain these at all times and this would help students to learn good practice:

If someone did like spot checks on what they did and they weren’t expected, that would improve things overall I think… if people are always wondering if they’re being checked on, they have better standards all the time M6 (year 2)
There was also identification of the need for someone with seniority to undertake such checks as handwashing audits were delegated to junior staff in some areas and it was perceived by students as being inappropriate due to a lack of confidence in the auditor to challenge poor practice in more senior staff:

she [the support worker] isn't going to be telling her seniors and the people she works with on a daily basis, she's not going to grass them up. I think it was kind of just an effort to show that they were seen to be following standards. I think if they really wanted to audit handwashing, surely somebody else should have to do it M12 (year 3)

National Information about Mortality in Pregnancy

Some of the students interviewed later in the study felt that having documents which highlighted infection issues in maternity care acted as a facilitator to improve practice as it was seen as directly relevant to midwifery:

I think the new Confidential Enquiry that’s been published … I think it said that the main cause of maternal death now is sepsis, that shocks a lot of people, I think maybe that … definitely it’s made us all open our eyes a bit but the midwives as well, they all know about it so maybe they’re all trying that bit harder M13 (year 2)

Discussion

The study sample was small and restricted to one university in the North of England. However, the findings may act as a catalyst for future study in this under-researched area world-wide and raise awareness of some of the issues perceived by midwifery students in their practice placements, considering the global problem of both HCAI and non-compliance with precautions to minimise these.

The identification of poor attitudes towards students who complied with IPC is of concern in this study if such attitudes have a negative impact on student learning and future practices. As negative attitudes and complacency have been reported to contribute to needlestick injuries in some areas of healthcare (Alexander and Limes, 2010), this is not solely an issue of patient safety and poor student education but also of staff safety, and ultimately risks to midwifery students. It has also been highlighted that the practices of healthcare workers can have an impact on the attitudes and practices of others (Jang et al., 2010).

There was clear support from students for theory to support practice. This was seen by some as a motivator for good practice as, if staff could identify or be provided with a rationale which was appropriate to their client group they were more likely to comply. National reports of infection specific to midwifery, such as the CMACE (2011) report, were also seen as a supporter of good practice as this again made the issues relevant to midwifery. Although this report is specific to the UK, more international literature such as that from the World Health Organisation (2011) may have the same opinion working together could potentially have a negative impact on infection rates within their own area.

Participants identified that conflicting practices were a barrier to learning as it was unclear at times which practices were acceptable. Students therefore needed to decide which practices they would continue to demonstrate. This issue has been highlighted in other areas of practice as impacting on patient care (Rodger and King, 2000) and in midwifery (Charrier et al., 2010) in relation to clean versus sterile delivery, but the impact on student learning also needs to be considered. This could be an important area for future research.

Role modelling for new mothers was identified as a way of enhancing student practices and learning as there was a need to demonstrate good practice. Pittet et al. (2004) have previously reported that compliance with hand hygiene in the US can be improved if the staff believe themselves to be role models for other staff, but there is little research evidence of the effect of role modelling to patients on the practices of healthcare workers and specifically on student learning. McInnes and Stone (2001) have previously discussed peer role modelling for breast-feeding mums but these role models were other mothers as opposed to midwives. This is clearly an area which warrants further investigation.

Crawford and Kiger (1998) have previously reported that midwifery students need to identify a good role model in order to enhance their learning. In this study, maternity units viewed as demonstrating good standards were used by students as role model units against which to benchmark practice. Such units were therefore used as a standard for practice on future placements, whether these placements practiced to the same standards or not. Conversely, Barrett and Randle (2008) state that negative role models can adversely affect practice among students due to a need to ‘fit in’.

Midwifery students highlighted the vulnerability of their client group as a facilitator to good IPC with babies. The use of risk perception in specific client groups as a way of improving practice has not been a focus in previous literature but it is worth considering for future research. Risk perception has been identified as a factor which can affect compliance in non-midwifery staff in Malaysia (Naing et al., 2001), but this has generally been specific to how healthcare staff perceive the risks to themselves in not complying as opposed to risks to their patients / clients. Further study may be worthwhile in this area to investigate the relationship between staff perception of risk to their client group and their levels of compliance with IPC. This might identify areas for future education or other interventions to improve practice globally.

The reasons for non-compliance suggested by participants in this study, such as time, workload and habit, are consistent with those reported in previous literature in relation to other staff groups and in other countries outside of the UK (Chiang et al., 2008; Gammon et al., 2008). The issue of harsh skin effects from repeated hand hygiene was mentioned as being a deterrent to proper hand decontamination. It has been identified previously that a significant proportion of patients presenting to dermatology clinics in the UK with occupational hand dermatitis are healthcare workers (Wilkinson, 2000). Larson et al. (2006) have also identified that the prevalence of skin irritation is higher in health care professionals than in the general population in the US. This is clearly a barrier to good practice that continues to impact on healthcare staff world-wide and ways of addressing this need to be investigated further.

The identification of competing demands as a reason for not always complying with IPC procedures is also consistent with previous literature with qualified midwives who have argued that emergency situations may preclude the use of correct procedures (Bott, 1999). Workload demands have been identified in other professions internationally as a reason for non-compliance with IPC. Cohen et al. (2002), for example, identified workload as a factor contributing to poor levels of handwashing in a dermatology department. Workload as a barrier to compliance with IPC precautions therefore seems to be a factor in midwifery in addition to other professions.
Conclusion

The overall aims of this study were addressed. However, several areas for further research were also identified. This study has demonstrated that there are several barriers and motivators to learning and applying good IPC standards in placement areas for midwifery students and though many of them have been identified previously in literature relating to other professional groups, there are some issues which appear to be specific to midwifery. There is a dearth of research literature in relation to IPC in midwifery and this study could act as a catalyst for further research in this area to identify issues relevant to midwifery practice and ways to address them, both in the UK and internationally where education and roles vary in this area and challenges to good practice may differ.

In terms of implications for both midwifery education and practice, it is clear that the attitudes of qualified midwives and the practices that they demonstrate can have an impact on both the education and practices of midwifery students. Midwives therefore need to be aware of the impact that they can have on their students, both positive and negative, and how this could affect the practices of the midwives of the future. There also needs to be a clear acknowledgement that practice areas are part of education for midwifery students and that the majority of the clinical learning occurs there — barriers to good practice and to learning therefore need to be identified and addressed to improve the learning experience and, ultimately, to reduce risks to women and their babies. Considering the issues identified of conflicting practices and the need for a theoretical basis, there is a clear need for educational establishments to work collaboratively with practice placements and for the evidence base for procedures to be clear. This may also have implications for the ongoing education of qualified midwives to ensure that they are able to teach correct and up to date procedures to their students.

References

Paper 8
Using Framework Analysis in nursing research: a worked example

Deborah J. Ward, Christine Furber, Stephanie Tierney & Veronica Swallow

Accepted for publication 9 February 2013

Abstract

Aims. To demonstrate Framework Analysis using a worked example and to illustrate how criticisms of qualitative data analysis including issues of clarity and transparency can be addressed.

Background. Critics of the analysis of qualitative data sometimes cite lack of clarity and transparency about analytical procedures; this can deter nurse researchers from undertaking qualitative studies. Framework Analysis is flexible, systematic, and rigorous, offering clarity, transparency, an audit trail, an option for theme-based and case-based analysis and for readily retrievable data. This paper offers further explanation of the process undertaken which is illustrated with a worked example.

Data source and research design. Data were collected from 31 nursing students in 2009 using semi-structured interviews.

Discussion. The data collected are not reported directly here but used as a worked example for the five steps of Framework Analysis. Suggestions are provided to guide researchers through essential steps in undertaking Framework Analysis. The benefits and limitations of Framework Analysis are discussed.

Implications for nursing. Nurses increasingly use qualitative research methods and need to use an analysis approach that offers transparency and rigour which Framework Analysis can provide. Nurse researchers may find the detailed critique of Framework Analysis presented in this paper a useful resource when designing and conducting qualitative studies.

Conclusion. Qualitative data analysis presents challenges in relation to the volume and complexity of data obtained and the need to present an ‘audit trail’ for those using the research findings. Framework Analysis is an appropriate, rigorous and systematic method for undertaking qualitative analysis.

Keywords: Framework Analysis, nursing, qualitative data analysis
ethnography’s description of cultures and the frameworks or stories that people employ in narrative analysis. There is also the focus on text and the use of language within discourse analysis (Albery & Munafo 2008). However, many published papers describe undertaking what could be defined as thematic or qualitative content analysis, even if failing to name it in this way or referring to it as one of the more recognized methodologies listed above (Sandelowski 2000, Braun & Clark 2006). This paper counters some of the criticisms levelled against qualitative research analysis and thematic analysis in particular, by discussing a worked example of Framework Analysis (FA) in nursing. FA is an emerging method of qualitative thematic data analysis that is increasingly popular in healthcare studies.

**Background**

**Criticisms of qualitative data analysis**

Antaki (2002) has argued that there is often an absence of clear and concise guidelines around thematic analysis, an issue that Attride-Sterling (2001) identifies as a disadvantage in the facilitation of methodological analysis. However, Braun and Clark (2006) state that the use of tools or guidelines that are too rigid can reduce flexibility and constrain analysis.

The opacity of qualitative data analysis is a common source of criticism levelled at this approach (Murphy et al. 1998). Furber (2010) asserts that there is a real need for transparency so that research reviewers, including those who have funded a study, can see how the findings were derived. Dixon-Woods (2011) highlights the need for techniques that enhance coding transparency. A lack of depth to analysis processes has been raised as a concern (Attride-Sterling 2001). Popay et al. (1998), for example, state that there is limited detail in most reports of analysis and findings from qualitative research to interpret the context and meaning of data.

Subjectivity, inherent in interpretive qualitative research (Sword 1999), has been criticized. However, it could be argued that no research or analysis approach is completely free of assumptions and biases and such a charge relates to the philosophy of knowledge informing differing methodologies. Quantitative research’s link with positivism places a premium on striving for objective knowledge, with participants regarded as objects whose data can be universalized (Elliott et al. 1999). Conversely, qualitative research is underpinned by various traditions (e.g. phenomenological, critical, postmodernist) that focus on human experience and social life, including people’s use of language (Elliott et al. 1999). Flick (1998), therefore, argues that the researcher’s communication with research participants is an explicit part of knowledge production in qualitative approaches. She goes on to state that the researcher’s feelings and reflections on their actions during the research process become data in their own right and this might apply to data such as field notes and reflexive diaries.

Taylor and Ussher (2001) highlight that authors of a qualitative paper often talk about themes ‘emerging’ from the data. They feel that this undermines the researcher’s significant input into theme identification and selection. It is therefore important that the role of the analyst in deriving themes is acknowledged to reduce the use of ‘emerging themes’ as a term because this implies that they appear with no thought or consideration. An audit trail can be helpful in this respect, which relates to being transparent about choices made during a study (e.g. through keeping a journal). It involves recording information about thought processes and decisions in terms of, for example, sampling, analysis and how codes and themes were developed.

Over recent decades, computer assisted qualitative data analysis software (CAQDAS) has facilitated researchers in their management of data, playing a key role in an audit trail. It is outside the scope of this paper to discuss this topic in-depth; readers can find more details in other publications (e.g. Wickham & Woods 2005, Garcia-Horta & Guerra-Ramos 2009, Lewis & Silver 2009). However, although computer packages can assist with the analytical process, researchers should bear in mind that the role of these packages is in organizing and sorting data, rather than interpretation; even when using a CAQDAS, investigators are still required to engage in ‘intellectual and conceptualizing processes’ (Thorne 2000; 68). Qualitative data analysis is a conceptual process and critical thought is needed. Those regarding computers as a means of analysis comparable to systems for quantitative data should be aware that the packages do not analyse qualitative data—the researcher is still required to do this. Hence, what can sometimes be considered at first glance to be an easy means of analysis is actually a process requiring time and thought—themes cannot be identified using short cuts if the researcher wishes to remain true to the data (Braun & Clark 2006).

Dixon-Woods (2011) suggests that the use of analysis teams can enhance qualitative data analysis transparency. Given that research is often performed by more than one person, it seems reasonable that an analysis approach should facilitate team analysis to improve rigour and so that, if one researcher leaves or is absent for any reason, other members of the team can continue analysis without
having to start at the beginning of the process again. This relates back to the previously mentioned need for both transparency and an audit trail. It is also possible that teams comprising individuals with differing roles and from different backgrounds may enhance rigour in data analysis. This is particularly the case in FA where teamwork and collaborative analysis is facilitated by the matrix-based nature of the analysis. Involving more than one person in qualitative analysis also addresses the issues of dependability and confirmability (Tobin & Begley 2004). Keeping a reflexive journal improves rigour by ensuring that procedures during the study and emerging ideas are recorded from recruitment of participants through to development of themes (Elliott et al. 1999).

Background to Framework Analysis

Framework Analysis was developed by social policy researchers in the UK (Ritchie & Spencer 1994, Ritchie et al. 2003) as a pragmatic approach for real-world investigations. It is increasingly used in healthcare research settings such as midwifery (Furber 2010), nursing (Swallow et al. 2011), and health psychology (Tierney et al. 2011). FA involves several inter-related but distinct stages (Rabiee 2004) that allow for theme-based or case-based analysis, or a combination of the two, through the development of charts that may be read across (cases) or downwards (themes).

Framework Analysis borrows principles from different epistemological traditions in the social science field; it is this eclecticism that has remained its strength throughout its development (Ritchie et al. 2003). However, it should be noted that FA is a method of data analysis rather than a research paradigm such as ethnography, phenomenology, or grounded theory. Its ontological position adheres most closely to subtle realism (Snape & Spencer 2003), which maintains that the social world exists independently of individual subjective understanding, but is only accessible in qualitative research via participants’ interpretations which are further interpreted by the researcher (Hammersley & Atkinson 1995). This links to nursing’s tradition of adopting a holistic approach to care. Such work may be undertaken using a qualitative approach. FA gives nurses a structured and established rigorous process for managing data, whilst also allowing for the flexibility associated with qualitative enquiry (Swallow et al. 2011). There are similarities between different approaches to qualitative research, including data immersion and reduction and a comparison of emerging themes. However, unlike entirely inductive and iterative approaches such as grounded theory, FA may be shaped by existing ideas and is less focused on producing a new theory.

It was developed for addressing specific questions and in that sense can be seen as an applied research approach that is useful for informing both policy and practice.

The benefits of FA

Framework Analysis is an explicit approach to analysis and sits in a thematic methodology (Bridgelal et al. 2008). It is considered as straightforward, provides transparent results and offers conclusions that can be related back to original data (Johnston et al. 2011). FA may be undertaken both during and after data collection (Ritchie et al. 2003). There is also the possibility for individual but linked studies to be analysed separately and then combined in the final analysis to identify crossing themes (Furber & McGowan 2011). It allows for flexibility and the easy retrieval of data to show others how decisions were derived (Swallow et al. 2011). Dixon-Woods (2011) praises the use of charting in FA for assisting transparency and team working. Charting also enables investigators with competing responsibilities (e.g. running a clinic) to stop the analysis and return later to continue where they left off.

As an approach, from the authors’ experience, FA can be useful when more practiced investigators are supporting those new to qualitative research because it provides a clear track of how data moved from interview to transcripts to themes, with summaries in charts enabling researchers to discuss ideas. It also permits researchers and service users to work together and consider a study’s progress (Furber et al. 2009) and provides an audit trail which improves dependability (Flick 1998).

Data sources

The research method used to collect data for the analysis to be discussed below is described more fully elsewhere (Ward 2010, 2011, 2012a,b).

Discussion

Framework Analysis and nursing research – a worked example

In summary, the study involved 31 nursing students. Participants were recruited to explore their experiences of clinical placements and their education needs in relation to infection prevention and control. Each participant was interviewed once for up to an hour by the first author who acted as the Principal Investigator (PI). She used a semi-structured approach until data saturation was reached. FA
was selected because it is flexible in terms of allowing data collection and analysis to run in tandem or consecutively (Srivastava & Thomson 2009) and provides a structured approach to transcript analysis. The other three authors became involved in the analysis process as they have significant experience in using FA. Following each interview field notes were taken and a reflexive diary was kept to ensure self awareness during the process from beginning to end and to acknowledge that there is subjectivity in terms of the researcher’s psychological and emotional responses, a common issue in qualitative research approaches. According to Sim and Wright (2000), some elements of subjectivity can be useful in enhancing insights which have been drawn from the data. A conceptual framework is shown as chart S1 to denote what was involved in each stage and to provide examples from the study under discussion.

Stage 1 familiarization – through immersion in the data

According to Rabiee (2004), the overall aim of this stage is to become immersed in the details of each transcript, to gain a sense of whole interviews prior to dividing them into sections and identifying recurring themes. The PI familiarized herself with all transcripts and was also the person who undertook all the interviews which improved the time taken to become fully familiar with the data (Ritchie et al. 2003). Field notes made immediately following each interview were read alongside transcripts by the PI to ensure that the context was taken into consideration. Field notes were also useful when developing the codes and indexing frame later in the FA process. Arthur and Nazroo (2003) highlight that field notes enable the researcher to record what is seen and heard during interviews, what thoughts and feelings occur and issues that may be relevant during analysis and these were important considerations when undertaking stage 1 of FA.

Srivastava and Thomson (2009) have stated that, due to the large volume of data in qualitative research, not every piece of material may be reviewed at this stage. However, the PI felt that the sample size was small enough for all transcripts to be studied. This ensured that all data from all participants were considered and that no data were overlooked. It was seen to be a more complete process, particularly with the PI being a novice in the use of FA as it was thought that data which were not commonly repeated might be missed if only a proportion of material was reviewed. Once this process was completed, a sample of transcripts was given to the FA interest group in the university. This group allows novice researchers to learn from more experienced ones and for individuals to pass on tips and references. All authors are members of this group and were involved in aspects of analysis with the PI analysing all transcripts and other members analysing a sample to improve consistency and rigour. There can be difficulties associated with a team approach to analysis in terms of agreement on themes and codes. However, in this instance there was one person leading and undertaking the research (the PI) who was more immersed in the data having conducted the interviews. She was ultimately responsible for decisions. Sim and Wright (2000) argue that the analyst must move to higher levels of abstraction without moving too far from the data: having a team approach to analysis ensured that this occurred. The fact that all transcripts were included meant that this process was time consuming. Overall, several whole days were invested in this stage alone but it was considered to be worth the time commitment for fuller inclusion and understanding of data.

Stage 2 developing a theoretical framework by identifying recurrent and important themes

The recurring themes identified in stage 1 can now be added to a chart either on paper or using computer software such as NVIVO, Microsoft excel (Swallow et al. 2003), or Microsoft Word (Furber 2010). In this case paper charts were used which may seem more time consuming but can be useful when wishing to see all the data at once as the charts can be displayed across a wall or even a room. This stage was undertaken by the PI alone. Table 1 outlines original themes and sub-themes identified in the study being described in this paper. These were derived from immersion in the data as discussed above and in collaboration with the members of the FA interest group. At this stage there was consensus but this may not always be the case, which is one of the difficulties that may be encountered in team analysis. As all transcripts were analysed by the PI but only a sample by the FA interest group, it was considered that, had consensus not been reached, the PI would have been able to defend her choice of codes and initial themes through the use of the field notes taken during the interviews and the reflexive diary kept during the process. At this stage there were the two main themes of university and practice related issues with sub-themes in these, which formed the draft framework. This stage is also time consuming and due to other commitments took place over several weeks.

Stage 3 indexing and pilot charting

The draft framework developed in stage 2 was applied back to the transcripts and notes were made regarding which
theme was reflected in each section. Ritchie et al. (2003) suggest that this is one way of undertaking this stage. A second way is to import transcripts into a computer file such as Microsoft Word or NVIVO. Noting emerging ideas on post-it notes may also be useful because they can be moved when thinking about how themes and sub-themes are related. In this worked example, as part of stage 3, themes and sub-themes were refined, combined and developed (Table 2). This process involves reading through transcript data and noting the related theme on the draft framework and was undertaken by the PI alone. The data in this case were indexed by coding and annotating the themes from the draft framework on the transcripts along-side the appropriate text. This allowed the PI to become further immersed in the data so that themes and sub-themes could be refined (Ritchie et al. 2003). Decisions in this stage were based on similarities and differences between initial themes and themes becoming clearer through further data immersion. It was identified that some sub-themes in the initial framework could belong in either main theme. This was the main basis for adjustment of themes to more accurately reflect the data and sub-themes emerging. A refined framework therefore resulted from this stage to ensure that data fit in only one theme and was not repeated in several.

Stage 4 summarizing data in analytical framework

This stage allowed the researcher to reduce material into understandable but brief summaries of what was said by participants (Ritchie et al. 2003) (Table 3). It has been argued that this can be more easily managed with a computer package as summaries can then be linked back to full text in the transcripts (Swallow et al. 2003). When using FA it can be difficult for the inexperienced analyst to know how much information to include in each section so as to not overfill charts but to have enough summarized data to make sense without having to frequently refer back to the original data. Novice researchers often make the initial

Table 1 Initial key themes and sub-themes from stage 2.

<table>
<thead>
<tr>
<th>Key themes</th>
<th>Sub-themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice</td>
<td>Good practice, Bad practice, Improving practice, Area influence, Impact on student practice, Confusion, Consequences of poor practice, Power differential, Attitudes to infection control</td>
</tr>
<tr>
<td>University</td>
<td>Reporting poor practice, University education, Practice education, Theory-practice links, Preferred teaching methods, Educational needs</td>
</tr>
</tbody>
</table>

Table 2 Resulting key themes following stage 3.

<table>
<thead>
<tr>
<th>Key theme</th>
<th>Sub-themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is seen as good and bad practice, the basis for this and the effects on learning</td>
<td>What is perceived to be good practice, What is perceived to be inappropriate practice, The basis for this judgement, The impact of observed practice on student practices, The impact of observed practice on student learning</td>
</tr>
<tr>
<td>Barriers to reporting poor practice</td>
<td>Barriers related to placement outcome, Barriers related to lack of knowledge of processes, Barriers related to inter-personal impact, Barriers related to power differential</td>
</tr>
<tr>
<td>The consequences of poor practice</td>
<td>Perceived consequences, Observed consequences</td>
</tr>
<tr>
<td>The theory-practice link</td>
<td>The role of theory in supporting practice, Consequences of not knowing theory which supports practice</td>
</tr>
<tr>
<td>Barriers and facilitators to good practice and learning good practice</td>
<td>Barriers to good practice, Barriers to learning good practice, Facilitators of good practice, Facilitators to learning good practice</td>
</tr>
<tr>
<td>Attitudes towards infection control and the infection control nurse</td>
<td>Attitudes of staff towards infection control, Attitudes of students towards infection control, Attitudes towards the infection control nurse</td>
</tr>
<tr>
<td>Educational needs and preferences</td>
<td>Educational needs expressed by students – university related, Educational needs expressed by students – practice related, Preferences for teaching and learning in infection control in university</td>
</tr>
</tbody>
</table>
error of providing too much information in charts rather than succinctly summarizing data (Li & Seale 2007). This can be overcome using the page line numbering function in Word, as demonstrated in Table 3, which enables the researcher to summarize a piece of data in the chart and include a reference of where to locate it in the transcript from line numbers on the left hand side. An asterisk can also be employed to indicate a particularly rich or meaningful quotation and where to find it in the transcript without having to write it out in full in the summary chart (Ritchie et al. 2003).

The rationale for allocating data to different themes can be difficult to identify in full research papers; provision of an example of the process can act as an illustration (Horsburgh 2003). An example of summarizing data and allocating this to a sub-theme for the study being discussed based on one participant’s narrative was in response to a question about why students do not report poor practice:

you’re worried that…if you started to say something…that could then affect you getting signed off

This section of the transcript was summarized in the chart as ‘worried about passing placement’ in the sub-theme of ‘barriers related to placement outcomes’ in the key theme of ‘Barriers to reporting poor practice’ (see Chart S1). In FA each stage of the process is connected so, for example, summaries can be linked back to actual quotes in transcripts, demonstrating a clear audit trail.

**Stage 5 synthesizing data by mapping and interpreting**

Allowing for refinement of themes in FA is said to aid in the overall development of a conceptual framework (Smith & Firth 2011). This stage allows for comparison of themes and sub-themes and checking against original transcripts, field notes, and audio recordings to ensure appropriate context. In this stage of the data analysis of the example under discussion, the charts were reviewed to see the whole data set which included checking the summaries on the charts against the original data and comparing the themes and sub-themes with each other to see if any further changes or merging was required. No changes were made to the themes or sub-themes at this stage and the final theoretical framework was agreed. This stage demonstrates the transparency of FA as at each stage the analysis process can be compared back to original data, enhancing rigour (Ezzy 2002). Ezzy (2002) also argues that this facilitates the inductive and iterative approach that is inherent in qualitative research, an issue earlier referred to when comparing FA with other approaches.

**Limitations of FA**

While this paper illustrates a worked example of FA in practice, it is important to note that there are limitations to the approach, as with other qualitative data analysis methods. FA can be time consuming, a disadvantage inherent in all thorough qualitative data analysis methods. It needs to be undertaken in a committed fashion to allow all data to be considered and to ensure a rigorous process. FA has been criticized for lacking the same theoretical underpinning as other qualitative approaches such as grounded theory and ethnography (Smith & Bekker 2011), though this has been highlighted earlier as a difference which can have advantages. FA has been identified throughout this paper as a flexible approach. However, it is argued by Pope et al. (2000)

### Table 3 Examples of data summaries from stage 4.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Good/bad practice, basis and effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sub-theme</strong></td>
<td>1.1 What is good practice?</td>
</tr>
<tr>
<td>Student 1</td>
<td>Use of alcohol handrub (page 4)</td>
</tr>
<tr>
<td>Different coloured aprons for different tasks (page 3)</td>
<td>Not changing gloves between patients (page 2)</td>
</tr>
<tr>
<td>Student 2</td>
<td>Cleaning beds between patients (page 2)</td>
</tr>
<tr>
<td>Having gloves and aprons available near beds (page 2)</td>
<td>Not cleaning theatre trolleys (page 4)</td>
</tr>
<tr>
<td>Student 3</td>
<td>Weekly hand hygiene audits (page 2)</td>
</tr>
<tr>
<td>Student 4</td>
<td>Not touching curtains after hand washing (page 6)</td>
</tr>
<tr>
<td>Changing gloves between patients (page 6)</td>
<td>Hand jewellery (page 2)</td>
</tr>
</tbody>
</table>

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that this flexibility can be a limitation because there is the potential for researchers to think that this flexibility means that short cuts can be taken, which is not the case.

Implications for nursing

Nurses, increasingly, undertake qualitative research but in doing so may be criticised for their lack of rigour, transparency, and audit trail in analysis. As an approach initially developed for the social sciences, FA is now being recognized much more in nursing and is therefore a data analysis approach which could be applied by both novice and expert nurse researchers when using qualitative data collection methods. Using this approach will address many of the criticisms levelled at analysis and will also enable nurses to work in teams as researchers and data analysers wish.

Conclusion

There is no single recommended best practice for qualitative data analysis, but it does need to be transparent and audit-able to improve the credibility of findings. FA addresses some of the criticisms levelled at thematic analysis. A worked example has been presented here to demonstrate its use in nursing research, highlighting how it involves organizing, reducing, and interpreting data. The various means of handling data in FA, in terms of its management and organization (e.g. using paper, post-it notes, Microsoft Word, Microsoft Excel, or NVIVO), offer flexibility and can meet the needs of different researchers. While there are difficulties inherent in qualitative analysis and therefore in FA, there are ways of attending to these to ensure that the process is rigorous. In particular, team analysis can be useful for confirming codes and themes. FA therefore supports several researchers being involved in the process of qualitative data analysis.

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Conflict of interest

None declared.

Author contributions

All authors have agreed on the final version and meet at least one of the following criteria (recommended by the ICMJE*):

- substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
- drafting the article or revising it critically for important intellectual content.

*http://www.icmje.org/ethical_1author.html.

Supporting Information

Additional Supporting Information may be found in the online version of this article:
Chart S1. Conceptual Representation of stages involved in analysis of the study.

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Appendix I – Student Interview Topic Guide

- Tell me what year you’re in and what programme you’re on
- Tell me about the placements so far that you’ve had during the course
- What practices have you observed in all your placements in infection control, both good and bad? (Paper 2)
- How do you know whether what you observe is good or inappropriate practice? (Paper 2)
- How has what you have observed affected your own practice? (Paper 2)
- Have you ever changed your own practices to ‘fit in’ within a placement? (Paper 5)
- If you observe poor practice do you take action and if not, why not? (Paper 2)
- Have you found what has been taught at university about infection control to be valuable in practice or not? (Paper 2)
- What preparation do you think you need from the university before you go out on placement? (Paper 3)
- What methods do you think should be used to teach infection control and where do you think it is best taught? (Paper 3)
- How prepared do you think you are when you begin placement in terms of IPC? (Paper 3)
- Have you ever met an infection control nurse? (Paper 4)
- What is your opinion of the infection control nurse? (Paper 4)
- What are the attitudes of the staff you’ve worked with towards the infection control nurse? (Paper 4)
- What do they say about him / her? (Paper 4)
- Does anything change on the wards when the infection control nurse visits? (Paper 4)
• Why do you think people don’t always do what they should in infection control? (Papers 5 & 7)
• Are there any issues specifically in midwifery that you think stop people complying with IPC precautions? (Paper 7)
• Is there anything that you have seen that helps staff to comply with IPC precautions? (Paper 7)
• Are there any reasons specific to midwifery that people might comply more or less than in other areas? (Paper 7)
• What do you personally think would make staff comply more? (Paper 7)
• What is the staff’s attitude generally towards infection control in the placements that you’ve had? (Paper 5)
• What’s the general overall perception of infection control within the NHS? (Paper 5)
• How has your practice changed in the time that you’ve been on the course? (Paper 5)
Appendix II – Mentor Interview Topic Guide

- How prepared do you think nursing students are in relation to infection control when they start placement? (Paper 3)
- What do you think about the knowledge and practices of student nurses in infection control? (Paper 3)
- How do you think infection control should be taught and who by? (Paper 3)
- What is your relationship like with your infection control nurse? (Paper 4)
- What do you think about your infection control nurse? (Paper 4)
- What are attitudes like on your unit towards infection control nurses? (Paper 4)
- Do you think practices change in any way when the infection control nurse comes to the ward? (Paper 4)
- Why do you think people don’t always do what they should in infection control? (Paper 5)
- What do you think the attitude is towards infection control in the area where you work? (Paper 5)
- What do you think the overall attitude is towards infection control in your organisation? (Paper 5)
- Do you think attitudes towards infection control demonstrated by qualified nurses could have any effect on student learning, and if so, what do you think these effects are? (Paper 5)
Appendix III – Stages in Framework within the Research

1. Familiarisation
   - Immersion in data by PI reading and re-reading transcripts along with field notes and re-listening to audio recordings. Notes made in transcript margins to record recurring ideas. Sample of transcripts read by members of a PA interest group at the PI’s place of work.

2. Developing a Theoretical framework
   - Recurring ideas collated and grouped into similar themes to develop initial framework on wall charts (can also be done on computer). Key issues initially divided into clinical placement or university-related issues.

3. Indexing & pilot charting
   - Draft framework applied back to transcripts and notes made about which theme reflected in each section, themes refined again.

4. Summarising data / charting within framework
   - Coding frame of key theme 2
     - 2.1 Related to placement outcomes
     - 2.2 Related to lack of knowledge of processes
     - 2.3 Related to interpersonal impact
     - 2.4 Related to power differential
   - Transcript examples
     - 2.1 You’re worried that... if you started to say something... that could then affect you getting signed off
     - 2.4 They could... turn around and say ‘well, you’re only a student’. I guess it’s just a question of respect as well

5. Synthesising data by mapping & interpreting
   - Charts reviewed so that whole data set addressed during stages 3 & 4. Themes and sub-themes compared with each other and against original transcripts, field notes and audio recordings to consider data context. Search for patterns. Seek explanations for patterns.

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Good practice</th>
<th>Inappropriate Practice</th>
<th>Basis for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P4. Use of alcohol handrub</td>
<td>P1. Reusing needles</td>
<td>P6. What has been taught at university</td>
</tr>
<tr>
<td></td>
<td>P1. Use of aprons in different areas</td>
<td>P2. Not changing gloves between patients</td>
<td>P4. Positive role models</td>
</tr>
<tr>
<td>2</td>
<td>P2. Cleaning beds between patients</td>
<td>P3. Not taking sharps bins to point of use of sharp</td>
<td>P5. NICE guidelines</td>
</tr>
<tr>
<td>1.</td>
<td>What is perceived as good or bad practice and the basis for this</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----</td>
<td>---------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Good practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>Bad practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>Basis for judgement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td>Reasons for poor practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Barriers to reporting poor practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Related to placement outcome</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td>Related to lack of knowledge of processes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td>Related to interpersonal impact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4</td>
<td>Related to power differential</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Possible consequences of poor practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Consequences for staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2</td>
<td>Consequences for patient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Theory-practice link</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Positive aspects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2</td>
<td>Negative aspects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Student knowledge deficits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1</td>
<td>Student views</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.2</td>
<td>Mentor views</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Education as a barrier in practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.1</td>
<td>Conflicting practices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.2</td>
<td>Role of university</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Preferred / recommended methods of teaching and learning in IPC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1</td>
<td>Student opinion of preferred methods</td>
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INTERVIEW 26

DW: If you could start off by telling what programme you’re on, which year you’re in and what branch you’re doing?

26: DPSN, may cohort, and adult branch, second year.

DW: Thinking about since you came, right up to and including now, can you tell me about what sorts of placements you’ve had?

26: I’ve done some research; ward work, and then sort of community … I’ve done everything from Health Centres, I’ve done some Walk-in Centres, and District Nursing – a lot of variety, basically everything the community do, so …

DW: And the ward work, what type of ward was that? Medicine or surgery or …

26: Medicine.

DW: Now, across all those placements, can you tell me about some of the infection control practices you’ve seen – both good and bad?

26: Well, what shall I start with! Start on a bad and end on the good note! Well, I would say, like, dressings is a big thing, because the whole concept of
ANTT, a lot of places I found wards tend to be a bit better, a bit more picky like, “Oh, you forgot to change your gloves and apron”, “Oh, you should have washed your hands”, and stuff, and, you know, picking up on everything, which is what I quite like, but, I don’t know, I found Walk-in Centres a bit, because of they’re caseload, I think they find there’s a lot of sort of – even between just different staff there – there’s no sort of standards, it’s just very very different. And again, with District Nurses, I’ve had them turn round to me and say, you know, “Well, we do it differently here”, and I’m thinking, “Why?”

DW: So they’ve not explained why they do it differently?

26: No. They just say, “We do it differently”, and … I sort of gathered it was because it wasn’t … I think they were trying to say it wasn’t sort of as possible to be as clean, if you know what I mean.

DW: You mean like in people’s houses?

26: Yeah. But, I mean, it was just little things like, you know, they could have taken paper towels with them to wipe their hands on instead of using people’s towels, and … I don’t know, I suppose it’s little things like that you pick up on, but, yeah, dressings is something I just … it’s just something that’s very very varied. I mean, there’s no sort of definite … you hear about it, and … but it’s just really confusing. But, I mean, everything else, like, I mean, things like injections and stuff, like people are very different with that, and there are always … are you supposed to wipe people’s arms with alcohol swabs? I’ve seen, when people take blood and stuff, and do injections, they wipe people with the alcohol swab things. I can’t remember what they’re called.

DW: Have you seen people not doing that?

26: Yes. I’ve seen people not do it, so I’m a bit like … I mean, I presume you are, because you’re piercing the skin, so … again, I’m not really sure.
DW: When you’re looking at practice, how do you decide, yourself, whether it’s good or bad practice?

26: I usually try to think common sense … like injections, if you look at someone and think, “Oh, you are piercing someone’s skin, they could have ……………………” (03.28), so it might have been better to clean the surrounding area, so if you are going to pierce the skin …………………… (?? – 3.33) blood especially, then it’s quite important that you don’t put anything in there from, even from their skin, like push it through … I mean, even if you’re doing anything really, sub-cut, I don’t want to risk it, just in case, I think. But I think some people think of that as, you know, “It’s only sub-cut, it’s not that important, it’s not like it’s IV or anything, so it’s not as much risk”, but I don’t know, I think I’d personally … although it’s quite scary, in some ways, being a student, you always think, “Well, will they look at me a bit weird if I start getting these alcohol wipes and start wiping people before I give them any sort of injection?” And do you try and go by a mentor, or … you do question some things, but, like, with some things as small as that, you always think, “Am I supposed to say anything?” And you do feel bad that you don’t kind of have to say it.

DW: Have you seen anything with IV therapy or urinary catheters that you think is good or bad practice?

26: I haven’t seen many catheters really, because I was only on the ward … there wasn’t that many, because of the ward I was on, but I haven’t really seen that much of it to say whether it’s good or bad. I mean, it’s very sort of … when I saw them, I saw them being cleaned and changed and things, and made sure they were changed, but I haven’t seen anything like bad about them, because I haven’t seen them a lot.

DW: What about staff other than nurses, like doctors and physios, have you seen them doing anything – good or bad?
26: I’ve seen some physios on the ward, they tend to wash their hands a lot, alcohol gel, and towels, and keeping their hands clean. Doctors, not as much. I’m not … I mean, some … you do get some doctors … I think doctors, now, it’s kind of half and half really, you do get some doctors … it actually tends to be females that I see more tend to clean their hands, and they … I mean, some male ones, but it tends to be more male ones that just don’t really bother. I mean, they might alcogel their hands occasionally, but it’s not in between each patient or anything. They might be like every five patients or something, or more, and … I don’t know, sometimes it’s just never! (LAUGHS)

DW: These staff members, whether they be nurses, doctors, or whatever, who don’t do what they’re supposed to be doing, why do you think that is? Why don’t they do it? I mean, you mentioned workload in the Walk-in Centre, but are there any other reasons that you think?

26: With doctors, I’m not sure, to be honest. I mean, I think, with nurse training, from the word go, you get training to say, “Infection control, washing your hands”, you get people going, “Oh, God! Another infection control lecture!”, but, I mean, you do forget, in your head, how important it is. So I think, from that, you just realise, okay … you get taught when you’re younger, “Wash your hands when you’ve been to the toilet” and all that sort of thing, but then you actually come into this whole new world and you think, “Oh, I’ve got to go and wash my hands when I’ve done this, and this”, but, I mean, it’s quite good because you do get it hammered into your head, and you get used to it, and get into a routine, and I think … I don’t know whether it is with doctors, I don’t know how they’re trained, but maybe they don’t get trained enough on things like this, because I think if they were trained as much as nurses, in it, then they would do it, because they’d be horrified to have someone say it. But I don’t think … I think the way the mentoring system works for them as well … I think because all the doctors haven’t been trained as much in it, and it’s quite a new thing for them, then I think the younger ones might be intimidated again, so you’ve got that whole thing of that as well.
DW: What about nurses who don’t do what they’re supposed to do, why do you think they don’t?

26: I don’t know. I think, sometimes, it is the lack of education again. Some people just think, you know, “Maybe I don’t need to do that”. I mean, infection control has changed a lot over the year and a bit I’ve been doing it, but, I mean, it’s probably changed a lot since they’ve done their training. It probably would help if they had some sort of refresher course in it, but then again, the Trust don’t give them a lot of time off to go to things like that, because of the workload and the lack of staff, so it’s hard. I mean, I think that’s one of the biggest contributors – workload – not necessarily just in a day, but in people relying on you and things, because you have to be there, because the wards are always short-staffed, because places are always short-staffed, and I think that’s the biggest thing – just people depending on you all the time.

DW: When you said ……………………………….. (?? 08.35) challenge the doctors when they’re doing what they’re not supposed to be doing?

26: I’ve not seen it. No. No. I mean, I’ve heard of some students in my cohort challenging several people, who are brave, but … (LAUGHS) but they’re very … I, personally, haven’t done it, and I haven’t seen any nurses do it.

DW: What do you think the general attitude is towards infection control out there?

26: Probably that it’s quite annoying, you know, that you haven’t got time for it, that’s the big thing, people just say they haven’t got time for it, “I’m doing this, because …” you know, but “you should do it like that when you do it, but I’m doing it like this because I haven’t got enough time to do it, because I’ve got to go off and see another, like, eight patients”, and I think it is people not having enough time ………………… (?? – 09.28)
DW: Have you ever met an Infection Control Nurse?

26: Yeah.

DW: And what do the staff think about the Infection Control Nurse?

26: I don’t know, actually. It depends … I mean, it actually depends on the person really. I mean, you do get some Infection Control Nurses, and think, “Oh, my God! I’m terrified!”, you do hear that sort of attitude … “Have you washed your hands?” and I’m thinking, “Oh, my God, I’m going to die!” But, I mean, you do get some … you know, it depends on the person … some staff you really like and are friendly. I mean, I think it’s the way they come across. They come across in some ways, and you’re thinking … I suppose it’s like any profession, really, when they come across not very nice, or a bit intimidating, or you can say, “Well, it would have been better if you’d have done that”, and “It would have been better if you’d have done that”, rather than screaming at someone.

DW: Do you think those that intimidate the staff are more effective at getting anything done, or not?

26: I think it depends on the person. I mean, to me, if someone came in yelling at me and stuff, I’d just be scared, and wouldn’t want to go to them for advice, whereas some people work better for being yelled at, whereas I’m the sort of person who I’d like someone to come to me and say, “Well, look, you did well, but if you do this, and you do that, and you do that, you can improve it a lot more and make it a lot safer”, and I’d appreciate that a lot more … being spoken to … and maybe not in front of someone. I don’t mind, say, if it’s something really important, like “Wash your hands, you’ve got to change your gloves” and things, but if it was something like, “Well, you could have done this”, just mention it after or something, because I don’t like being spoken to like that.
DW: So since you’ve been on this course, how has your infection control practice changed?

26: I try and wash my hands ……………… (11.33) again it is time, and you do get a lot of …………………… (11.35) as a student, I mean, time is the biggest thing, and I don’t know how they’re going to cope ……………………… nurses in the future, because it’s already mad! But, I mean, you do try, and you can’t do it for the proper amount of time … you just can’t! You can’t justify it, in between everything you’re doing.

DW: Have there been other areas where you think you may have lowered your standards, just because that’s what everybody else is doing on the ward?

26: I suppose maybe like on the injection thing, I’m still a bit iffy about what the exact procedure is for it, but, you know …

DW: So that’s what you normally do, do on the ward …

26: Yeah, I basically … no one’s ever said to me really … you know, I think it was taking bloods, which I can’t do anyway yet, and I won’t be able to for another year, and they were saying, “When you do it, don’t do that”, I can’t remember what they were doing, but …

DW: That’s very helpful!

26: Yeah! But, I mean, usually I … I actually do copy my mentor, and no one has said, “This is bad”, don’t do it. They’ve just sort of done it and then expected me to do it the same way, but then again I’ve had … working with other staff, and people have said, “Why are you doing that?” And I’m thinking … you know, you get really confused. But then you go back to this other person, “Why do you do that?” and it’s … I don’t know … I know they’re trying to standardise it, but there’s still no definite standards for all things, and it’s just … it’s really hard to know which is right.
DW: So that will affect your practice.

26: Yeah.

DW: Have you seen any infection control practices that you thought were dangerous and were putting patients at risk?

26: No, nothing like … life-threatening. Definitely. I mean, not when I’ve thought, “Oh, my God, what the hell is that person doing?” Nothing that bad! I think I would say something then!

DW: You would?

26: (LAUGHS) Yeah, I would!

DW: Because you said earlier you wouldn’t really want to challenge this member of staff. What is it that stops you either challenging a person, or telling somebody else about the bad practice? What stops you doing that, do you think?

26: I don’t know. I suppose some staff can be quite intimidating, and as a student you’re very looked down upon, and it’s quite hard to … I mean, it’s quite easy on a ward, sort of, to be kind of an equal, but you kind of … you’re in this kind of weird space, where you’re in between a care support worker and a nurse, so whatever way they want to treat you as, they sort of do it as though you don’t really know where you stand. Then sometimes you’d feel okay going to the Sister and talking to her, other times you feel a bit, “Oh, I don’t really know!”

DW: So you think you’d report if the people are more approachable … and what wards would differ, depending on what people are like?
26: Just ..................... people are different as well. I mean, if I was a practitioner nurse who was very good at her job but she’s terrified .................. when I came to her, just because she’s very loud and scary, but I mean, I think if the staff were approachable, in higher places, then that would help, because … I think everything should be reported to a Sister, but, you know, they just need to be more approachable about it, and more understanding. I suppose, in a way, if they’re the ones who are more focused on infection control, the nurses, if they were down, they would copy them, because they’d think, “Well, if she’s doing it, then I’ve got to do it, otherwise she’ll … I’ll be in trouble”, so I suppose that would help.

DW: If you were on a ward, and your mentor was the Ward Sister, and she did something really bad – infection control – and you wanted to report it, who do you think you would go to?

26: I wouldn’t actually go to … I mean, I’d probably … to ask, I’d probably just go to one of my tutors in uni, and ask who I’d go to first.

DW: Would you consider going to the PEFs at all? Practice educators?

26: I wouldn’t know where to go.

DW: Have you ever met one?

26: No.

DW: Do you know what they’re supposed to be doing?

26: No.

DW: Okay! I think that’s what everybody has said, to be honest. Is there anything else that you want to tell me about what you’ve seen, in infection control, in placement, before we move on to the University side of things?
26: No, that’s pretty much it.

DW: Thinking right from the beginning and up to now – and just the University to start off with – what training or education have you had on infection control from the University?

26: Does this include the …

DW: Lectures, Skills Lab …

26: Does that include the ones held at the Hospital?

DW: No, I’ll come on to those. So the ones held at the University, and in the Skills Labs, lecture theatres, whatever.

26: What, what do I think of them, or …

DW: No, what have you had.

26: What have I had? Erm … I think … we had like a massive infection control thing at the beginning of the whole course.

DW: Massive thing? What was that?

26: It was quite a lot of stuff, apart from lectures. It was things like … you’d get handwashing, oh … I actually can’t remember it a lot, sorry.

DW: Was this right at the beginning?

26: Yeah, it was right at the beginning, and we haven’t had a lot of stuff that long. They usually break it down now. I think I had some things about injection techniques.
DW: Have you had any lectures on infection control since then, at the University?

26: I don’t think from the University, no. I think the only ones we’ve had are from the Trust itself.

DW: Have you had any time in the Skills Lab at the University, with regards to infection control?

26: Not with regard to infection control, no.

DW: Handwashing technique or anything like that?

26: No.

DW: What have you had from the Trust?

26: Well, we’ve had things like injection technique, and we’ve actually had specific lectures on ANTT.

DW: And how often do you have this kind of thing?

26: It can vary between modules. The last module we had quite a few, which were really good … and the one before that was just rubbish.

DW: These are specific to your Trust, aren’t they?

26: Yeah.

DW: Not necessarily in every Trust?

26: Yeah. Some of them.
DW: The rubbish ones, why were they rubbish?

26: It can vary … some of the lecturers, their drony voice, and you sit there, in the sweltering heat, and you just think, “Oh …!” It’s just one of these situations that you just think … “You just are not a good speaker!” Yeah, but, I mean, the good ones, the people who do keep your attention, but it’s the way you can present things as well. I mean, quite a lot of … doing nursing, and especially doing the DPSN, you sort of require quite sort of practical work, so, you know, if people vary it between things, like, “This is how you do it”, and show us a slide show, and then say, “Well, come on, go and practice on this dummy” and stuff.

DW: So more small groups you would prefer?

26: Yeah. The smaller groups are better, I think, like we have in the Trust lectures, and it makes you feel more involved … just better speakers, really. Some people can go on!

DW: Do you think it’s important to learn the theory as well as the practice, or would you rather just learn the practice?

26: Yeah, I think the theory is good, because it sort of shows you … I mean, when you’re in practice, and people say, “Do this”, and you kind of think, “Why?” Some people might not be able to explain it to you, but if you have the theory, people say, “Bacteria can get in here if you don’t do this, and this could cause this, this and this”, and then you go, “Okay. Well, don’t really want to do that to someone”, “Okay, how do I do it physically, then?” and then get shown, it’s sort of a nice balance to have.

DW: So you’d like a mix between theory and practice?

26: Yes.
DW: The theory first, and then the practice follows?

26: Yes. Probably, yes.

DW: And smaller groups?

26: Yes, definitely.

DW: Do you think lectures are an appropriate way of teaching infection control?

26: No. I think smaller groups … the Skills Lab, which I’ve never seen yet, that would probably be better … but whether it happens …

DW: Are there any topics, in infection control, that you think you should have been taught about by now, that you haven’t?

26: Not that I can think, of no. I mean, I, personally, have had quite a lot of stuff that I’ve picked up upon in placements, you know, I’ve learnt – whether it’s right or wrong or not! But I suppose you do need a couple more lectures really, just … not really stuff we haven’t done, but just sort of reiterating the stuff we have done, because we have … I think we seem to have a lot on handwashing, because we all know that by now, but we don’t seem to have a lot on anything else.

DW: What sort of things would you like?

26: Well, I’d quite like some more things on injection techniques, so you can do it robotically, because when someone’s going in a lecture, “How do you wash your hands?” and we’re all going like this … you know … you can do it in your sleep! And it took, to me it’s quite good really because you know how to do it, so it would be quite good to be able to do things … I mean, like
dressings, again, I’d like to be able to do that in my sleep, so I know, “I’ve got to change my gloves and wash my hands. I’ve got to do this and this”.

**DW:** Would you rather learn that in the Skills Lab than out in practice?

**26:** Probably both, because then I could sort of … I think then, if I had a definite idea of what I was supposed to do, I’d feel more confident in challenging people, and then if I’d had more theory sessions I’d be able to back it up with evidence, and say, “Look, we had a lecture on this, we got taught this is how we do it, because of what we learn”, and then I’d feel a bit more confident saying to people, “Well, actually, I’m definitely sure this is how you do it”, so … “Do it like this, or I’ll report you”. (LAUGHS) Probably better not to threaten people! (LAUGHS)

**DW:** So between now and the end of your third year, what do you anticipate you might learn more about in infection control?

**26:** To be honest, I don’t actually know. We don’t get any sort of ……………. (?? -22.25) I hope to learn a bit more sort of … I hope everything gets clarified.

**DW:** So you’d like …………… (??-22.30) you went out in practice so maybe some at the end of your third year, just to bring everything together

**26:** Well, I’d still like some in my second year as well, just to get it in my head,, because, I mean, we’re going to have a lot of stuff put on us in our third year, I don’t want to sort of … I mean, everyone’s attitude to infection control is, “Oh God, not this again!” but …

**DW:** It seems to stick in.

**26:** Yeah. But, I mean, because you’ve had it so much … well, some of them so much, you do think, “Well, it’s good that we do know it”, but, I mean, there
are some grey areas where you’re talking to people, and they’re going, “Oh, we do it like this”, and you think, “Oh, I don’t!”

DW: So maybe, at some point, you could all do with writing down what your grey areas are, and then somebody from the profession could meet those requirements, so you are getting what you want?

26: Yeah, it would be quite good if people came in said. ‘‘Right, we’re going to do ………”, and work on this and go … “We’re going to watch everyone do it, and then we’re going to tell you the right way, and then we’re going to watch you all do it again”, and then have questions.

DW: Yes. So that’s more the Skills Lab again.

26: Yeah. I suppose it would be quite handy if people would actually sit down and show us how it was supposed to be, before our third year, because I wouldn’t want to get near qualifying and then think, “Oh, God, how do I do this?” “Am I still doing this wrong?” I mean, especially if you get on to your third year and you’ve got into the routine of how you do everything, and for someone then telling you you’re doing it wrong, in your third year, you’d think, “Oh, my God! Am I doing anything else wrong?” It’s not very good for your confidence, but, again, it’s not really your fault, because you’ve been taught that way. So it’s really hard!

DW: You said some of the lectures you’ve had have been boring … who would you think are the better speakers, the better people to teach you about infection control?

26: What, do you mean names, or …

DW: Not necessarily … I mean, do you prefer the sessions that you have from the clinical staff that are actually …
26: I think that’s quite helpful having the people who are there, just because they are there and they do it every day, so it’s quite nice because you can always ask them questions, and I suppose they’ve got to keep quite up-to-date with all the new stuff, so … you know, they’re always teaching you new things, which is quite handy, whereas … I don’t know, do we get lectures off people who haven’t done it for a few years?

DW: ……………………

26: Yeah! I suppose I don’t really see the point of that, of people who haven’t really done it … yeah, I mean, I probably would rather get taught from people who have done it, or …

DW: Or can give you examples from practice.

26: Yeah. Exactly. If someone said, “Oh, someone did this. How did they do it wrong? How can we make it better?”

DW: Thinking about staff who are qualified out there on the ward, you said they don’t get time for updates, how often do you think they should have an infection control update?

26: At least once a year, because …

DW: And do you think they get offered that, or not?

26: By the looks of things, no, because they’d probably be better. Well, they might get offered it, but whether, again, if they’re offered the time off … but I do think it’s as important, if not more so, than basic …………………… (?? - 25.53) support, which they do go on religiously every year, yet people think, “Oh, infection control!”, but they don’t seem to bother about it, whereas it is just as important.
DW: So maybe they don’t see if it … it being as important as the BLS (??) and the manual handling?

26: Yeah.

DW: Why do you think that is?

26: I don’t know. I think quite a lot of it might be … I don’t know if … I suppose, like infection control people … it goes back to where people don’t wash their hands if they can’t see anything on it … you know, I think that could be maybe why doctors don’t really … because, I mean, surgeons probably always wash their hands and stuff, but you don’t ever see doctors do it, and I think it’s because of that … whereas we get taught a lot that there are germs that we can’t see … but I think it’s a lot to do with, you know, “Well, we can’t see it, so there’s nothing there, so it’s okay”.

DW: ………………………………

26: Yes.

DW: Is there anything else you want to tell me about infection control, that you’ve thought of as you’ve been going through?

26: No, don’t think so.

DW: For somebody who’s actually at the beginning of their second year, you’ve come out with quite a lot really! Anything else you want to tell me?

26: No.

END OF INTERVIEW 26