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Student nurses' experiences of infection prevention and control during clinical placements

Key words: nursing education; infection prevention and control; clinical experience

Abstract

Background

Little is known about nursing students' experiences of infection control in the clinical setting despite its importance protecting patients and reducing risks of occupational exposure.

Methods

Online survey involving a fixed choice Likert-type scale with nineteen items and an open question to solicit more detailed information with a national sample of student nurses in the United Kingdom.

Results

Four hundred and eighty eight student nurses completed questionnaires. All participants reported lack of compliance for every item on the Likert scale, most frequently from community settings and long-term care facilities for older people. Incidents most commonly witnessed were failure to comply with hand hygiene protocols, failure to comply with to isolation precautions, poor standards of cleaning in the patient environment, not changing personal protective clothing between patients and poor management of sharp instruments. Qualified nurses did not provide good role models. Medical staff were the occupational group most heavily criticised for poor compliance.

Conclusion

Students demonstrated sound understanding of infection control and were able to identify lack of compliance on the basis of pre-clinical classroom instruction. The study findings indicate that ensuring safe infection control practice remains a challenge in the United Kingdom despite its high priority.

197 words

Introduction

Healthcare-associated infections (HCAs) are the most frequently reported adverse events in healthcare delivery ¹. Education about infection prevention and control (IPC) is important at an early stage in student nurses' pre-clinical experience to protect patients and reduce risks of occupational exposure to infection ^{2,3}. Studies exploring student nurses' knowledge of IPC have produced mixed findings. Some reports indicate sound knowledge. In these studies student nurses were better informed than medical students, more convinced that IPC was important and their self-reported levels of compliance were higher ^{3,4}. Other studies have identified poor understanding of the principles of IPC among student nurses ^{5,6} and specific gaps in knowledge, probably because time dedicated in nursing curricula is insufficient to cover all necessary topics in sufficient depth ⁷. There appears to be little official guidance about what student nurses should be taught. However there is general agreement over the key IPC precautions that should be delivered in preparation for clinical practice in the research literature: hand hygiene, use of personal protective equipment (PPE), isolation precautions, safe handling and disposal of sharp instruments, principles of asepsis, maintaining cleanliness in the clinical environment and ensuring that equipment is decontaminated between patients ^{8,9,10}.

Numerous studies have explored different approaches to the delivery of IPC instruction to student nurses ^{8,9}. Classroom delivery in universities has been criticised because nurse educators are generalists who may rely on textbook material that does not keep abreast with recent, rapid developments in IPC ⁹. This can be overcome with up-to-date e-learning packages ⁸, while simulated patient care exercises in the clinical skills laboratory have been suggested as a way of helping student nurses grasp the complexity of clinical decision-making in relation to IPC ¹⁰. The presence of university teachers in clinical areas has also been identified as a mechanism for encouraging compliance with IPC precautions by ward staff ¹¹. Student nurses have identified qualified nurses as important role models for key aspects of IPC ^{12,13}.

Student nurses' experiences of IPC in the clinical setting have received less attention than methods of instruction. There appears to be an assumption that they will be able to transfer knowledge about the principles of IPC acquired in the classroom to patient care. However, little is known about the examples set by qualified practitioners despite their importance as students' role models.

Student nurses' experiences of infection prevention and control during clinical placements

A search of the literature identified two studies that explored student nurses' clinical experiences of IPC. An interview study with forty student nurses revealed examples of good practice, especially when qualified nurses performed aseptic procedures, but poor practice was more frequently reported: failure to clean equipment and change PPE between patients, unsafe handling of intravenous lines and urinary catheters and poor compliance with hand hygiene protocols¹⁴. Student nurses in this study benchmarked quality of IPC witnessed in clinical areas against practice taught by university teachers. They did not challenge poor compliance because they were afraid of failing placements and did not want to be seen in a negative light by the staff responsible for their clinical reports. Some student nurses admitted compromising standards to fit in with local practice.

In a second study student nurses reported high levels of poor IPC during clinical placements¹⁵. The most commonly reported incidents were poor compliance with isolation precautions, presence of contaminated equipment in the clinical environment, breaches of aseptic technique, failure to cleanse hands and exposure of staff to blood and body fluids.

Both studies were small scale and each took place with students recruited from a single university whose clinical experience was limited to a few organisations. The study reported below explored the clinical experiences of a national sample of student nurses in the United Kingdom (UK).

METHODS

Study design

A descriptive survey was undertaken utilising an online questionnaire. There were nineteen Likert-style questions and one open-ended question that solicited additional comments on IPC.

The questionnaire was designed to be completed rapidly to encourage participation and was anonymous. Questions were developed from existing studies^{8, 9, 10, 14} augmented by the researchers' expertise in IPC. Student nurses were presented with a range of different possible lapses in IPC and asked to indicate whether they had never been witnessed, witnessed occasionally (once or twice), witnessed often (every week) or very often (every day). Responses were captured by commercial software developed especially for use with online surveys (Question Pro <https://www.questionpro.com>).

Sample

The survey included student nurses undertaking pre-registration courses in the four countries making up the UK: England, Wales, Scotland and Northern Ireland. They were recruited via an electronic link to the survey placed on the website of the Royal College of Nursing (RCN). The RCN is a union membership organisation that represents the interests of nurses and nursing, promotes excellence in nursing practice and helps shape health policy across the UK. Most of its members are qualified nurses, but there is a student nurses' forum with over two thousand members. The electronic link remained open for three weeks on the advice of the website conveners whose experience suggested that after this time no further recruitment could be expected.

Ethical issues

Permission to undertake the study was granted by the ethics committee of the university that employed members of the research team and by experts in ethical issues pertaining to nursing and nurse education at the RCN. The website carried a short explanation about the purpose of the survey, what participation would entail and emphasised that responses would be anonymous. Consent forms were considered unnecessary: willingness to participate would be implicit in voluntary completion and return of the online questionnaire.

Pilot study

A pilot study was undertaken with sixty two student nurses undertaking pre-registration training in a single university. They had undertaken clinical placements in four different National Health Service (NHS) trusts and in nursing homes outside the NHS. Student nurses were invited to complete the questionnaire at the end of lectures by members of the research team with whom they had not previously had contact. There were no refusals. The questionnaire format was acceptable, captured the required information and all the questions were answered in fifteen minutes. No changes to the main study data collection instrument were considered necessary. There were 45 responses to the open question. These were inspected and used to develop a coding frame for the main study data. They provided additional detail about specific examples of non-compliance reported on the Likert scale. Participants also commented on the occupational groups responsible and types of clinical setting where lapses took place.

Analysis

The number of responses to each category on the Likert scale was summated automatically by the survey software and means were calculated. The qualitative data were categorised using the previously developed framework which identified the type of clinical setting where the reported incident took place, occupational group responsible and the nature of the incident.

RESULTS

Eight hundred and forty seven student nurses accessed the survey instrument and of these 488 completed it.

Likert scale

All participants reported witnessing lack of compliance and it was reported for every item on the Likert scale (see Table 1). Lack of compliance was most commonly witnessed in relation to hand hygiene. Over 75% reported witnessing failure to cleanse hands between patient

contacts, 61.2% reported health workers wearing rings (in addition to wedding bands) and 60% reported health workers wearing painted nails or nail extensions. Failure to comply with isolation precautions, poor standards of cleaning in the near patient environment, not changing PPE between patients and poor management of sharp instruments had each been witnessed by over half the sample.

Qualitative data

One hundred and three (21.2%) student nurses offered additional comments. Six of these (5.8%) reported witnessing good levels of compliance. The remainder described up to six examples of poor compliance, often in considerable detail. Conduct in relation to isolation precautions and aseptic technique were heavily criticised. Poor compliance was most frequently reported from community settings and long-stay facilities for older people. Qualified nurses were often criticised for poor practice, usually in relation to breaches in aseptic technique or failure to implement isolation precautions properly. Doctors were the occupational group most frequently and heavily criticised. Their most common failings were not cleansing hands between patients, not being 'bare below the elbow', unsafe handling and disposal of sharp instruments and failure to comply with aseptic technique when intravenous cannulae were inserted. Unqualified nursing assistants were also criticised, chiefly for not wearing PPE, not changing PPE between patients and failure to clean equipment between patients. Major lapses in personal hygiene were reported for all occupational groups: scratching, touching the face and biting nails during episodes of patient care. Ten reports indicated poor support for IPC at institutional level: delays repairing broken bedpan washers, shortages of equipment, particularly disposable gloves, and delays removing rubbish from patient areas.

Although knowledge had not been tested formally, understanding of IPC could be inferred from responses to the open question. Knowledge of hand hygiene precautions, aseptic technique and risks associated with blood and body fluids were sound and six students displayed particularly good knowledge about the principles underpinning hand hygiene and

aseptic technique. However, there was confusion about the correct sequence of events to follow when patients were nursed in isolation.

Two students had been so concerned about poor compliance with IPC protocols that they had raised the issue with the ward manager, but in both cases their experiences were discouraging as they reported receiving poor ward reports.

DISCUSSION

Other studies exploring student nurses' experiences of IPC in the clinical setting have been small scale and restricted to a single university^{14, 15}. The study reported here obtained data from a much larger sample recruited nationally. As in previous studies, student nurses demonstrated high levels of commitment to IPC and appeared strongly motivated to comply with IPC guidelines and protocols⁴. Understanding of IPC was generally good. Some students appeared to have sophisticated knowledge of the principles of IPC, confirming earlier work that demonstrated sound knowledge for this group^{2, 3, 4}. There was no evidence that student nurses' pre-clinical instruction has been inadequate because university teachers were not conversant with developments in IPC⁹. However, students' comments, particularly in relation to isolation precautions, demonstrated the complexity of implementing IPC in the clinical setting identified by other authors^{10, 15}. Overall the findings support the conclusions of earlier researchers who explored experiences of IPC in the clinical setting^{14, 15}. Qualified staff provided poor role models for student nurses. Isolated examples of good practice were described, but there was disturbing evidence of lack of compliance that placed patients at risk of infection and staff at risk of exposure to infection, especially from blood, body fluids and contaminated waste. In the few cases where they challenged poor practice, students had been penalised. Despite the high profile of IPC in the UK in recent years, there was evidence of poor institutional practices to support IPC. Evidence of failure to comply with hand hygiene protocols was especially disappointing in the wake of major campaigns to promote hand hygiene compliance in the UK. In many cases ward managers could have improved practice by establishing clear rules about nail enhancements and wearing jewellery. They could also have provided greater supervision for unqualified nurses and been more proactive to ensure

that ward areas were better serviced to promote a safe, clean environment with the necessary resources. Previous research has suggested that the presence of university teachers in clinical areas could encourage better compliance with IPC precautions by ward staff ¹¹. Similarly the findings of this study indicate the need for better role models for student nurses that could be provided through clinical visits by university teachers.

Student nurses inferred that their own IPC practice was of a high standard, reflecting previous findings ^{3, 4}. However, as in previous work ¹⁴, they were often highly critical of other staff, especially doctors. These findings are in line with earlier work that established a culture of blame between different groups of staff in relation to IPC ¹⁶. Nurses employed in the care home sector who frequently admitted patients from acute hospitals attributed high levels of methicillin-resistant *Staphylococcus aureus* (MRSA) to lack of compliance with IPC protocols in hospital wards. Conversely those in acute hospitals blamed the high incidence of MRSA on standards in nursing homes while assuming that their own practice was satisfactory. The phenomenon of blaming other staff for lack of compliance is striking and worthy of more detailed investigation, especially as there is some evidence that nurses over-estimate their compliance with key IPC precautions ^{12, 16}.

Study limitations

Only a small proportion of student nurses belonging to the RCN accessed the survey questionnaire and of those who responded, only just over half completed it. The approach to sampling introduced additional bias as the survey was accessible only to students who belonged to the RCN. Whether or not these students differ from the rest of the student nurse population in the UK is unknown. However, this was the only practical means of recruiting a national sample within a reasonable time frame. The statutory bodies responsible for nursing in the UK do not hold records of those in training and the alternative approach, through individual universities, would have been labour-intensive, time-consuming and depended on enlisting the co-operation of university staff to secure recruitment. An additional drawback to sampling was the possibility that we recruited a particular type of student: the survey probably attracted those with a special interest in IPC, those who had witnessed especially poor

practice and those who had suffered through attempts to draw attention to lack of compliance. The extent to which the students' responses reflect an accurate representation of IPC practice in the clinical setting might also be questioned. In the study by Geller et al ¹⁵ students had been trained to identify and report adverse events, so their reports are likely to have reflected reality. Ward ¹⁴ assumed that student nurses would be able to recognise poor IPC practice effectively and this was confirmed in the data. In our study, except for some misunderstandings in relation to specific IPC issues that are acknowledged to require complex decision-making ¹⁰, students also appeared to be able to identify lack of compliance. Thus, for all its limitations this study provides the most comprehensive account of student nurses' experiences of IPC in the clinical setting. It indicates the need for improving role models and illuminates the need for constant monitoring of the clinical environment to monitor and promote acceptable standards of IPC.

References

1. Kaier, K, Wilson, C, Hulscher, M, Wollersheim, H, Huis, A, Borg, M, Secluna, E, Lamber, ML, Palomar, M, Tacconelli, E, De Angelis, G, Schumacher, M, Wolkewitz, M, Klessle, EM, Frank, U. Implementing bundles for infection prevention and management. *J Infect*; 40:225-228.
2. Wurtz, R, O'Neal, B, Dolan, M, Azacon, E. Student infection control and screening. *Am J Infect Control* 1993; 21:93-94.
3. Darawad, MW, Al-Hassami, M. Jordanian nursing students' knowledge of, attitudes towards and compliance with infection control precautions. *Nurs Ed Today* 2012
<http://dx.doi.org/10.1016/j.nedt.2012.06.009>.
4. Van de Mortel, TF, Kermode, S, Prozano, T, Sansoni, J. A comparison of hand hygiene knowledge, beliefs and practices of Italian nursing and medical students. *J Adv Nurs* 2012; 68:569-579.
5. Thunberg, H, Sjostrom, E, Skyman, I, Hellstrom, MK. Cross-infection prevention, basic hygiene practices and education within nursing and health care in Latvia: a Swedish-Latvian practice development project. *Nurs Ed Today* 2003; 23: 404-411.
6. Al-Hassami, M, Darawad, M. Compliance of nursing students with infection prevention precautions: effectiveness of a teaching program. *Am J Infect Control* 2012;
<http://dx.doi.org/10.1016/j.ajic.2012.03.029>,
7. Jennings-Sanders, A, Jury, L. Assessing methicillin-resistant *Staphylococcus aureus* knowledge among student nurses. *Nurs Ed Today* 2010; 30: 789-793.

8. Pellowe, C, Adams, J, Elliott, S, Murrell, K, Cox, D. The use of an e learning infection prevention programme in the pre-registration nursing curriculum. *J Infect Control* 2010; 11: 255-257.
9. Hegg, M, Reime, A, Harris, A, Asknes, J, Mikkelsen, J. The most successful teaching method in teaching student nurses infection control – E-learning or lecture? *Am J Infect Control* 2008; 28: 798-806.
10. Mikkelsen, J, Hegg, M, Reime, A, Harris, K. Nursing students' learning of managing cross infections: scenario-based simulation training versus study groups. *Nurs Ed Today* 2008; 28: 664-671.
11. Williams, L, Burton, C, Rycroft-Malone, J. What works: a realist evaluation of intermediaries in infection control practice. *J Adv Nurs* 2012; DOI: 10.1111/j.1365-2648.2012.06084.x
12. Cole, M. Exploring hand hygiene competence of student nurses: a case of flawed self-assessment. *Nurs Ed Today* 2000; 31:380-388.
13. Barrett, R, Randle, J. Hand hygiene practices: nursing students' perceptions. *J Clin Nurs* 2008; 17: 1851-1857.
14. Ward, D. Infection control in clinical placements: experiences of nursing and midwifery students. *Nurs Ed Today* 2010 *J Adv Nurs*; 66: 1533-1542.
15. Geller, N, Bakken, S, Cume, LM, Scnall, R. Infection control hazards and near misses reported by student nurses. *Am J Infect Control* 2010; 38: 811-816.

16. Morrow, E, Griffiths, P, Gopal Rao, G, Flaxman, D. 'Somebody else's problem?' Staff perceptions of the sources and control of methicillin-resistant *Staphylococcus aureus*. Am J Infect Control 2011; 39:284-291.

Table 1. Infection prevention and control concerns reported by student nurses in rank order of occurrence

	<i>n</i>	%
Not cleansing hands between patient contacts	373	76.4
Wearing rings (excluding wedding bands)	300	61.4
Wearing painted nails, nail extensions	293	60
Failure to apply isolation precautions (e.g. not wearing PPE)	292	59.3
Poor cleaning (e.g. lockers, trolleys, baths, wash bowls)	275	56.4
Not changing personal protective clothing between patients	261	53.6
Poor practice 'sharps' management (e.g. re-sheathing)	255	52.3
Using mobile telephones during patient contact	237	48.6
Reusing items without cleaning between patients	217	44.5
Items stained with blood or body fluids	195	40
Not being 'bare below the elbow'	195	40.8
Dealing with body fluids without wearing gloves	175	35.9
Poor practice in relation to urinary catheters (e.g. disconnecting catheter from drainage system)	171	35
Cleansing hands with water only	158	32.4
Re-use of scissors during dressing procedures without cleaning	156	32
Poor management of intravenous therapy (e.g. disconnecting lines from access device)	140	28.7
Inappropriate storage of sterile items (e.g. torn or dusty outer wrapping)	76	15.6
Re-use of single-use item	39	7.9
Insertion of a urinary catheter without gloves	24	4.9

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