Needlestick injuries (NSIs) and sharps injuries are a potential source of harm. Such injuries can cause considerable distress and have an economic effect on both the person who is injured and the healthcare organisation. Although data regarding trained nurses are more plentiful, there is a dearth of published information and research on the incidence and causes of NSIs and sharps injuries in the nursing student population, especially in the UK. This article provides an overview of the available evidence. There is a need for better education of nursing students and more effective supervision in relation to NSIs and sharps injuries.

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Needlestick injuries (NSIs) and sharps injuries are a potential source of harm to healthcare workers worldwide. Registered nurses and nursing students are exposed to these risks on a daily basis, when administering drugs in the healthcare setting and also when practising in the clinical skills laboratory. For the purposes of this article, NSIs are defined as the introduction of a hollow-bore needle into the body of a healthcare worker with the possibility for contamination with blood or other potentially infectious material. Sharps injuries relate to injuries caused by lancets, scalpels and glass, as well as hollow-bore needles.

NSIs and sharps injuries can result in the transmission of disease. According to the Royal College of Nursing (RCN 2009), there are more than 20 blood-borne infections that can be contracted following a NSI or sharps injury. Examples are listed in Box 1. One report suggested that 11 healthcare staff working in the UK have developed hepatitis C and five have developed human immunodeficiency virus (HIV) as a consequence of an NSI or sharps injury since the late 1990s (RCN 2009). Although there is no information about specific cases, the majority of exposures to NSIs and sharps injuries occur in nursing staff (Goob et al 1999), presumably because of the frequency of needle and sharps usage in nursing practice.

NSIs and sharps injuries have health consequences for and cause psychological stress to injured clinicians and their families (Elucir Gir and Canini 2004, O’Connor 2008, RCN 2009). A contributing factor to the psychological impact of NSIs is the ‘silent nature’ of many infections – those who are injured do not know if they have been infected until they undergo tests (Symon 2009). NSIs have an economic effect on the clinician through lost income if he or she contracts a disease relating to the injury.

**BOX 1**

**Infections that can be transmitted by needlestick and sharps injuries**

- Hepatitis B and hepatitis C.
- Human immunodeficiency virus.
- Tuberculosis.
- Syphilis.
- Malaria.
- Herpes simplex.
- Diphtheria.
- Ebola.
- Cutaneous manifestations of gonorrhoea.
- *Staphylococcus aureus*.
- *Streptococcus pyogenes*. (Gillis 2000)
There is also a financial burden on the NHS as a consequence of lost productivity, treatment costs and litigation (Trueman et al 2008). NSIs that occur during insulin administration cost the NHS approximately £600,000 per annum (Trueman et al. 2008). The financial estimation was based on the potential cost of post-NSI prophylaxis, laboratory tests, counselling, treatment of transmitted diseases and litigation (Trueman et al. 2008). Insulin administration is considered a high-risk procedure for nurses because of the number of insulin injections required and the lack of training and safety devices in this area. There are lawyers who now specialise in accidental occupational NSIs and sharps injuries in the UK and the United States (US) (Gillis 2000).

### Incidence of NSIs and sharps injuries in nursing students

In the UK there are minimal data relating to NSIs in the nursing student population. However, studies have been conducted in Asia, US, Canada, Australia and European countries (Table 1). The author undertook a literature search using AMED, British Nursing Index, Cumulative Index of Nursing and Allied Health Literature (CINAHL), SwetsWise, ScienceDirect and Wiley Online Library for studies relating to NSIs and sharps injuries in nursing students.

As shown in Table 1, only a small number of studies were found. Although it is difficult to make exact comparisons between published studies because of variations in study design methods and the different number of students reported, the data are presented in Table 1.

#### Table 1

<table>
<thead>
<tr>
<th>Author and date</th>
<th>Country</th>
<th>Aim of the study</th>
<th>Methodology</th>
<th>Sample size</th>
<th>Incidence of NSIs and sharps injuries</th>
<th>Percentage of NSIs and sharps injuries not reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yassi and McGill</td>
<td>Canada</td>
<td>To explore the determinants of staff exposure to blood or body fluids</td>
<td>Audit of recorded cases</td>
<td>799 reported cases</td>
<td>12% (n=96)</td>
<td>No data available</td>
</tr>
<tr>
<td>(1991)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Puro et al</td>
<td>Italy</td>
<td>To analyse the rate of occupational exposure to blood and body fluids</td>
<td>Multi-centre prospective study</td>
<td>35,000 employees</td>
<td>15% (number not supplied)</td>
<td>No data available</td>
</tr>
<tr>
<td>(2001)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shiao et al</td>
<td>Taiwan</td>
<td>To describe the prevalence and characteristics of NSIs</td>
<td>Survey, using a questionnaire</td>
<td>708 nursing students</td>
<td>61.9% (n=438)</td>
<td>86.9%</td>
</tr>
<tr>
<td>(2002)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Wang et al</td>
<td>China</td>
<td>To examine the impact of a structured training programme on the prevention of occupational exposure to blood-borne pathogens</td>
<td>Quasi-experimental study involving a questionnaire and observation</td>
<td>106 nursing students</td>
<td>32% (n=34)</td>
<td>No data available</td>
</tr>
<tr>
<td>(2003)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Yang et al</td>
<td>Taiwan</td>
<td>To examine the frequency and mechanism of NSIs and sharps injuries</td>
<td>Survey, using a questionnaire</td>
<td>569 nursing students</td>
<td>501% (n=264)</td>
<td>61%</td>
</tr>
<tr>
<td>(2004)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Smith and Leggat</td>
<td>Australia</td>
<td>To investigate the prevalence and nature of NSIs</td>
<td>Survey, using a questionnaire</td>
<td>274 nursing students</td>
<td>13.9% (n=38)</td>
<td>39.5%</td>
</tr>
<tr>
<td>(2005)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Blackwell et al</td>
<td>United States</td>
<td>To determine the incidence of NSIs in the nursing student population in a small university</td>
<td>Online survey</td>
<td>96 nursing students</td>
<td>9.4% (n=9)</td>
<td>95.8%</td>
</tr>
<tr>
<td>(2007)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Talas (2009)</td>
<td>Turkey</td>
<td>To identify the frequency of NSIs and sharps injuries</td>
<td>Survey, using a questionnaire</td>
<td>668 nursing students</td>
<td>49% (n=230)</td>
<td>56.1%</td>
</tr>
<tr>
<td>Yao et al (2010)</td>
<td>China</td>
<td>To describe and characterise the rates and nature of NSIs</td>
<td>Survey, using a questionnaire</td>
<td>246 nursing students</td>
<td>26.05% (n=64)</td>
<td>96.24%</td>
</tr>
</tbody>
</table>
studies, the incidence ranges from 9.4% to 61.9%.

It is difficult to compare the incidence of NSIs in the nursing student population with that for registered nurses, as there is a paucity of accurate data available in the UK and worldwide relating to the number of NSIs and sharps injuries in both populations (Adams and Elliott 2007). However, 17% of all injuries among the healthcare workforce relate to NSIs and sharps injuries (second only to moving and handling injuries, where one in four nurses have taken time off with an occupational back injury) (National Audit Office 2003). This equates to about 100,000 NSIs and sharps injuries per year in the NHS in the UK (UNISON 2008). Fifty per cent of NSIs are reported by registered nurses (Gordon 2003, NHS Employers 2005). A survey of 4,407 nurses carried out by the RCN found that 48% had been injured by a needle or sharp that had previously been used on a patient (RCN 2009); the figure was 37% in an earlier study involving 6,000 nurses (RCN 2003). Worldwide, various studies have been conducted to investigate the incidence of NSIs and sharps injuries. For example, a small survey of 50 nurses in India showed that 70% had had an NSI (Simon 2009). In the US, there are a reported 500,000 NSIs per year affecting healthcare workers, with 1:10 involving a patient with known human immunodeficiency virus (HIV) (Gershon et al 2000).

**Reasons for not reporting needlestick and sharps injuries**

A major problem in terms of understanding the incidence of NSIs and sharps injuries is that such injuries tend to be under-reported (National Audit Office 2003). The RCN (2002) has stated that 23% of NSIs in registered nurses in the UK are not reported. This problem has also been identified among nursing students, as shown in Table 1.

Research has identified a variety of reasons regarding why nursing students do not report NSIs and sharps injuries (Box 2). These factors are similar to the reasons that registered nurses do not report these injuries. For example, Simon (2009) found that 32% (n=8) of nurses did not know how to report the injury, 56% (n=14) did not think it was worth reporting and 12% (n=3) were too embarrassed and thought that the accident was their fault.

Trueman et al (2008) identified that nurses in the UK regularly do not report NSIs because they feel that it reflects bad practice and that reporting procedures are not always in place. Not reporting also occurs when the needle causing the NSI is sterile and is hence perceived as a ‘clean needle’ (Gillis 2000, Raghavendran et al 2006). Gillis (2000) stated that, if the needle is contaminated, nurses may take a ‘fatalistic’ view that there is nothing that can be done and therefore may choose not to deal with the problem. In Raghavendran et al’s (2006) survey of UK doctors, nurses and operating department practitioners ‘several’ respondents stated that reporting NSIs and sharps injuries ‘served no purpose’.

**When and where needlestick and sharps injuries occur**

Common clinical areas in which NSIs and sharps injuries occur include surgical departments and medical settings (Yang et al 2004, Blackwell et al 2007, Yao et al 2010). It was suggested that these areas of practice may be common areas for NSIs or sharps injuries because of nursing students’ frequent exposure to sharps in these clinical settings. Other common locations include obstetrics and gynaecology, paediatrics, oncology (Yao et al 2010), outpatient departments (Yang et al 2004) and critical care areas and operating rooms (Talas 2009). Many injuries occur on wards and in patients’ rooms (Talas 2009). However, Smith and Leggat (2005) found that 45% of NSIs and sharps injuries were sustained outside the clinical area in nursing laboratories during practical simulation. The researchers suggest that this may have been due to students’ inexperience in handling needles. Data relating to when NSIs and sharps injuries commonly occur are shown in Table 2.

Injuries can occur when nursing students are ‘discharging air’ from the syringe (Yao et al 2004).

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**BOX 2**

**Reasons given by nursing students for not reporting needlestick injuries (NSIs) and sharps injuries**

- The needle was unused and the student perceived the NSI or sharps injury as ‘minor’ (Smith and Leggat 2005, Talas 2009).
- The student’s subjective opinion was that the needle was non-infectious and no consequences had resulted from previous NSIs (Shiao et al 2002).
- Students were too embarrassed and were worried about getting in trouble (Smith and Leggat 2005).
- Students were unaware of the reporting procedure (Shiao et al 2002, Cervini and Bell 2005, Smith and Leggat 2005).
- Students were ‘too busy’ and did not want to be seen as having poor clinical skills (Shiao et al 2002).
- Students were worried that reporting the injury would affect their grades (Shen et al 1999).
- Students were worried about being stigmatised for other reasons (Tenenbein et al 2008).
- Students were not aware of the potential risks associated with contaminated needles or sharps (Emilieh et al 2004).
2010), during the injection procedure and when withdrawing medication from the ampoule (Shiao et al 2002). Researchers have identified that injuries are frequently sustained by nursing students on opening medication ampoules; the incidence of injury on ‘opening an ampoule’ ranges from 43% (Talas 2009) to 21.3% (Shiao et al 2002). The most common type of injection associated with NSIs is intramuscular (Yang et al 2004, Yao et al 2010). Less common causes include disassembling the needle and syringe after use (Shiao et al 2002, Smith and Leggat 2005), being struck accidentally by a colleague (Shiao et al 2002) and sharps disposal (Shiao et al 2002, Smith and Leggat 2005, Yao et al 2010). In the Talas (2009) study, NSIs and sharps injuries occurred on the hand in 98.7% of cases. Smith and Leggat (2005) found that 15.8% of NSIs involved a contaminated needle.

**Possible reasons why needlestick and sharps injuries occur**

Researchers have proposed many possible reasons why NSIs and sharps injuries occur so commonly in the nursing student population. It is thought that nursing students are at increased risk because of their limited clinical experience and underdeveloped skills (McCarthy and Britton 2000, Shiao et al 2002, Talas 2009, Yao et al 2010). However, Perry and Jagger (2005) have stated that the risk of injuries is associated not only with skill, which is related to the frequency that a procedure is performed, but also with hazards inherent in the instruments and the procedures, for example the type of needles and glass products used. Insufficient training has been cited as a significant factor, as most injuries occur during the early phase of a student’s training (Shiao et al 2002). Nursing students may have insufficient background knowledge to recognise the level of risk posed by intramuscular and subcutaneous injection procedures (Talas 2009). Students perceived that schools and hospitals often provided insufficient occupational safety training (Shen et al 1999). Another consideration is inadequate supervision in clinical practice (Talas 2009).

Petrucci et al (2009) found that 42.5% of NSIs occurred when the student was working alone. Other possible factors include tiredness due to a lack of sleep – Blackwell et al (2007) found that some nursing students reported having slept badly the night before an injury. Anxiety has also been proposed as a risk factor, particularly when nursing students are caring for patients with known blood-borne pathogens (Blackwell et al 2007). Another risk factor is leaving needles or cutting instruments in trays (Molina 2003).

With regard to the registered nurse population, Perry and Jagger (2005) reported that critical care environments are high-risk areas for NSIs. They suggested that this is because of the pressure involved in crisis situations and the fast response required from staff. Re-sheathing the needle is a common cause of NSIs among registered nurses (Aiken et al 1997, RCN 2003, Simon 2009). This practice causes 58% (Gordon 2003), 32% (Simon 2009) and 20% (RCN 2003) of NSIs in registered nurses. NSIs and sharps injuries commonly occur during disposal (Simon 2009). Studies show that 22% (RCN 2003), 30% (Gillis 2000) and 37% (Gordon 2003, Health Protection Agency 2008) of NSIs occurred during disposal. These injuries were caused by overfilling the disposal bins and on transporting needles to the sharps bin.

It has been reported that most NSIs occur during the day (Simon 2009). This could be because of increased nursing activity during this time. However, Gillis (2000) found that decreased

### TABLE 2

**Data on when needlestick and sharps injuries occur in nursing students**

<table>
<thead>
<tr>
<th>Author, date and sample size</th>
<th>Re-sheathing the needle</th>
<th>Opening the needle and removing from the sheath</th>
<th>Preparing the medication</th>
<th>Opening the ampoule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talas (2009) (n=473)</td>
<td>27%</td>
<td>N/A</td>
<td>N/A</td>
<td>43%</td>
</tr>
<tr>
<td>Yao et al (2010) (n=246)</td>
<td>20%</td>
<td>20%</td>
<td>25%</td>
<td>N/A</td>
</tr>
<tr>
<td>Yang et al (2004) (n=569)</td>
<td>18.6%</td>
<td>23.7%</td>
<td>21.2%</td>
<td>N/A</td>
</tr>
<tr>
<td>Shiao et al (2002) (n=572)</td>
<td>14.8%</td>
<td>9.4%</td>
<td>9.7%</td>
<td>21.3%</td>
</tr>
<tr>
<td>Smith and Leggat (2005) (n=274)</td>
<td>N/A</td>
<td>34%</td>
<td>N/A</td>
<td>26%</td>
</tr>
</tbody>
</table>

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Prevention of needlestick and sharps injuries in nursing students

**Education** NHS Employers (2005) have stated that training and education in NSI prevention is essential. However, 45% of registered nurses have reported that they do not receive training from their employer on safe needle usage (RCN 2009). Robust infection control educational strategies for nursing students (Adams and Elliott 2007) and ongoing education for registered nurses (Gillis 2000) are required. Before nursing students commence their first clinical placement they should be educated in universal safety precautions (Liddell et al 2002, Talas 2009). Such education should incorporate high-risk procedures such as taking the cap off a needle and opening an ampoule (Smith and Leggart 2005). Guidelines from the National Institute for Health and Clinical Excellence (Pellowe et al 2003) state that sharps should not be passed from the clinician’s hand to another person’s hand, and that needles should not be re-capped, bent, broken or disassembled before use or during disposal.

The safe disposal of sharps requires attention. As 22% of NSIs occur during disposal (RCN 2003), nurses need to be educated to discard sharps as close as possible to the point of use (Pellowe et al 2003). Sufficient sharps bins should be made available for this purpose (NHS Employers 2005). Nursing students should be more concordant regarding universal precautions, especially during the disposal of sharps (Shiao et al 2002). Such training needs to be integrated into an education programme. Hatcher (2002) conducted a study using the ‘plan, do, study, act’ approach and showed that NSIs reduced when sharps disposal practice improved. This process involves planning the change to be implemented (plan), carrying out the change (do), reflecting on the change (study), and planning the next change (act) (NHS Institute for Innovation and Improvement 2011).

Evidence on the effectiveness of needle-protection devices is available. A review of 17 studies demonstrated a 22% to 100% reduction in reported NSIs following introduction of these devices in the workplace (Tuma and Sepkowitz 2006). Cullen et al (2006) investigated almost 1,000 reported NSIs and concluded that 80% could have been prevented with the use of needle-protection devices. Ninety-five per cent of nurses consider safer needle devices to be ‘essential’ or ‘preferable’ to the use of a conventional needle and syringe (RCN 2009). Students should be taught the principles of using such devices. However, only 50% of trained nurses have access to needle-protection devices (RCN 2009), which means that a similar percentage of students will probably have poor access to such devices.

As well as training in practical skills relating to giving injections, nursing students also require education on blood-borne diseases and related precautions (Jeffe et al 1999, Bailey 2008). Wang et al (2003) conducted a quasi-experimental study involving 106 nursing students in China. The study compared an experimental group and a control group using questionnaires and observation of practice. The researchers found that a blood-borne pathogen prevention programme significantly increased knowledge (P < 0.001) and self-reported behaviours (P = 0.002) in relation to NSIs.

The prevention and management of NSIs and sharps injuries should be an important part of pre-registration nursing curricula (Simon 2009). Education and training programmes are also required to increase the reporting rates of NSIs and reduce the risk of blood-borne diseases (Yao et al 2010). Blackwell et al (2007) advocated annual education about the incidence of and risks and policies regarding NSIs for clinical instructors and nursing students, as well as competency assessments for nursing students in relation to injection technique. The RCN (2009) has recognised the importance of supervising students in practice, especially during disposal of equipment. The RCN has also emphasised that nursing students need to know how to access support and that they should receive timely and competent advice.

Petrucci et al (2009) found that the probability of accidental exposure to NSIs and sharps injuries is reduced with the increase of clinical skills during the nursing student’s training period and by having an adequate number of tutors in clinical education. Logan (2002) conducted a survey of 710 nursing students in the US and found that students followed recommended needle safety precautions more often when modelling the...
actions of 'admired' teachers than when modelling the actions of 'admired' staff nurses. The students also reported that staff nurses followed needle safety precautions less often than the teachers.

In the US, Beekmann et al (1994) developed an intensive training programme involving videos and interactive sessions relating to universal precautions. This programme resulted in a reduction in NSIs and sharps injuries despite an increase in workload and staff numbers over a four-year period. Zafar et al (1997) conducted a study involving 1,500 healthcare workers in the US, using a pre-post test design, to investigate the effect of a comprehensive educational programme on NSI prevention. The programme comprised lectures, videos and handouts and emphasised the importance of safe disposal and not re-sheathing needles. A 'needlestick hotline' was established for healthcare staff to call for advice and to report incidents. There was a large reduction in NSIs and sharps injuries, especially those relating to re-sheathing needles and over-filling sharps bins. The number of incidents fell from 112 to 22 per year over four years. Gershon et al (1999) also studied the effect of implementing a comprehensive programme aimed at reducing sharps injuries in a 450-bedded hospital in the US. The programme involved introduction of new disposal systems, educational sessions and an improved reporting process. The researchers state there was a 69% reduction in sharps injuries over the seven-year study period. Wang et al (2003) found improved practice and a reduction in NSIs in a group of 106 nursing students who had been involved in an educational intervention, including a 60-minute lecture, a 20-minute video and printed material over a four-month period.

**Improved reporting of NSIs**

It is generally accepted that improved monitoring and surveillance procedures should be implemented to monitor NSIs (Adams and Elliott 2007, Trueman et al 2008). Nursing students should be educated on the importance of reporting NSIs and the correct procedure involved (RCN 2009). Adams and Elliott (2007) recommended mandatory reporting because there is evidence to suggest that some students are unaware of the consequences of NSIs and sharps injuries and how to report them. Mandatory reporting will emphasise the importance of the reporting process. There appears to be some confusion regarding what should be reported. Gabriel (2009) stated that all incidences of needle and sharp injuries, including the equipment used, who was affected and the circumstances surrounding the injury, should be reported and that each organisation needs to have a clear reporting procedure. NSIs should be reported immediately for the reasons listed in Box 3.

Everyone sustaining a NSI needs support and advice (Bailey 2008). The RCN (2009) has stated that all nurses should be able to access timely and competent advice following a NSI, 24 hours a day, seven days a week. O’Connor (2008) described the introduction in New South Wales, Australia, of a needlestick injury hotline, which provides immediate information, risk assessment, support and referral for injured healthcare workers. It is run by senior nursing staff with a background in infection control, and when evaluated it was found to be providing a valuable service. To aid the process of reporting NSIs, Blackwell et al (2007) stated that emphasis should be placed on the fact that reporting NSIs would not result in punitive action against the nursing student. There needs to be regular surveillance of accidental NSIs to identify problem areas in healthcare settings and health education organisations. Policies and procedures pertaining to sharps usage should be reviewed regularly to ensure the most effective disposal technology and equipment is available to staff (Gillis 2000).

Nurses should be able to recognise and prevent causes of harm. It is imperative that employers carry out risk assessments for all staff (NHS Employers 2005, RCN 2009). This involves risk assessment in the workplace and within the clinical skills laboratory. Yang et al (2004) recommended further research to investigate the incidence and causes of NSIs and sharps injuries in practice areas, especially outpatients departments, clinics and emergency departments, due to the high number of nursing students sustaining injuries in those departments. Blackwell et al (2007) stated that, despite the growing body of knowledge concerning NSIs, there is little research focusing on NSIs in the nursing student population.

**Conclusion**

NSIs and sharps injuries are common among nursing students. Such injuries have psychological and economic effects on the injured person and

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**BOX 3**

**Reasons for reporting needlestick injuries immediately**

- Appropriate management to reduce blood-borne virus transmission can be instigated and immediate preventive treatment can be given.
- The documentation of the incident is important in case of potential future claims for industrial injury.
- To assess the effectiveness of preventive measures.
- To identify injury trends.

the healthcare organisation as well as the potential to transmit disease. There is also a high incidence rate of NSIs and sharps injuries among registered nurses. NSIs occur in most clinical areas, including clinical skills laboratories. They can happen at any of the stages associated with intramuscular and subcutaneous medicine administration. Many NSIs are not reported. There needs to be a more thorough process of incident reporting so that occurrence rates can be analysed. Education on the correct procedures for handling and disposing of needles in clinical areas and skills laboratories should be targeted more effectively at nursing students. Education should also encompass the use and promotion of needle-protection devices; this has been shown to reduce the incidence of NSIs. In addition, more comprehensive supervision of nursing students is required in the clinical environment and the simulation laboratory. Healthcare organisations and health institutions need to review policies and procedures on NSIs and sharps injuries and perform the necessary risk assessments to prevent these injuries. NSIs and sharps injuries are preventable and more research is required, especially with regard to the nursing student population in the UK NS

References


Beekmann SE, Vishov D, Koziol DE, McShalley ED, Schmidt JM, Henderson DK (1994) Temporal association between implementation of universal precautions and a sustained, progressive decrease in percutaneous exposures to blood. Clinical Infectious Diseases. 18, 4, 562-569.


Zafar AB, Butler RC, Podgorny JM, Mennonna PA, Gaydos LA, Sandiford JA (1997) Effect of a comprehensive program to reduce needlestick injuries. Infection Control and Hospital Epidemiology. 18, 10, 712-715.