



The effective needle stick injury prevention strategies for nursing students in the clinical settings: a literature review

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KEYWORDS

Needle stick injury;
Nursing student;
Prevention;
Strategy

Abstract

Objective: Nursing students are prone to needle stick injuries (NSIs) during their practice in the hospitals. This study aimed to identify the effective NSI prevention strategies for nursing students in the clinical settings.

Method: Literature review was performed using the databases of ScienceDirect, ProQuest, MEDLINE, PsycINFO, Scopus, CINAHL, SpringerLink, JSTOR, and PubMed. The search terms of “nursing students”, “NSI incidents”, “prevention”, and “clinical settings” were entered, generating 103 articles published between 1991 and 2015.

Results: Our study demonstrated the high rates of NSIs in low- and middle (India, 91.85%), and high-income countries (Taiwan, 56.00%). Most injuries especially occurred when students opening the ampules (53.15%) and performing intravenous cannulation (44.50%). Our review identified four main strategies to prevent NSIs; education, trainings, safe needle use, and effective communication. Our study suggested the development of education and trainings curriculum and self-report system and culture, the provision of financial, material and manpower resources to support the prevention of NSIs.

Conclusions: four main strategies to prevent NSIs were education, trainings, safe needle use and effective communication.

Implications for practice: collaboration of hospitals and educational institutions is essential to develop effective NSI prevention programs.

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Introduction

Nursing students are at high risks of needle stick injuries (NSIs) during their practice in the clinical settings. They are exposed to sharp hazards while handling medical equipments, such as when they are administering medications or taking blood samples. Therefore, it is crucial for students to possess adequate competences regarding the procedures that require them to handle sharp devices.

To date, many studies had reported the high rates of needle stick injuries among nursing students. A study in Namibia demonstrated that 17% of total students had NSIs (Small, Pretorius, Walters, & Ackerman, 2011). Moreover, another study in China showed that among those who were injured were not vaccinated (Shiao, Mcclaws, Huang, & Guo, 2002). Consequently, they are at higher risks of various bloodborne infections, such as human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV).

Despite the rate of injuries are relatively high, students had low awareness on the importance of reporting the injuries to head nurse and/or Clinical instructors. A study in India showed that 98.4% of students were injured during procedures with sharp devices. The study, furthermore, showed that only 18.4% of them reported the incidents (Mitra, Malik, Das, & Roy, 2010). Similarly, a study in Namibia showed that, of 55 percent of students who had NSIs, only 17 percent reported their incidents (Small et al., 2011). Underreported incidents occurred because students did not know how and where to report, were too busy, or were certain that the injuries had no negative consequences (Jan, Akhund, Akhtar, & Shaikh, 2014).

There are various strategies to prevent NSIs. Nevertheless, some countries, particularly low- and middle- income countries, face obstacles in achieving their mission in lowering NSIs. One of the most common obstacles includes financial constraints that frequently stand in the way of creating safer environment and preventing injuries for students, resulting in inadequate supply of resources (Hambridge, 2011).

Method

Literature review was employed in this study, aiming to explore the effective needle stick injury prevention strategies for nursing students in the clinical settings.

We performed electronic searches in ScienceDirect, ProQuest, MEDLINE, PsycINFO, Scopus, CINAHL, SpringerLink, JSTOR, and PubMed to identify full- text review articles and studies published in 1991-2015, in Bahasa Indonesia or English that we consider represent the strategies of needle stick injury prevention. The search terms of “nursing students”, “NSI incidents”, “prevention”, and “clinical settings” were entered into the databases, generating a total of 303 articles. The articles discussed about the NCI prevention strategies across 29 countries.

This study comprised two main stages. At the first stage, 200 articles were deleted due to duplication and irrelevancy with the research topic. At the later stage, 103 selected articles were analyzed, in which 5 articles of them were specifically reviewed and analyzed. The study was performed in over 9 months, from October 2014 to July 2015.

Results

Our review discussed about the incidence of needle stick injury among nursing students, factors associated with needle stick injury, consequences of needle stick injury, and needle stick injury prevention strategies.

Needle stick injury among nursing students

Some articles presented the incidents of needle stick injury among nursing students in 13 countries. The incidents were dominantly high in low and middle income countries. The incidents were highest in India, accounting for over nine tenth of the total respondents (91.85%). Surprisingly, the incidents in The high income countries, such as Taiwan and Unites States were also relatively high, accounting for over half (56.00%) and over one third (38.00%) respectively. The incidents were lowest in Hong Kong with the proportion of less than 2 percent (1.60 %) (Table 1).

Factors associated with needle stick injury

Some articles identified factors associated with needle stick injury. The results revealed that over half of the injury occurred when students opened the ampules (53.15%). Nearly half of the respondents were injured due to intravenous cannulation (44.50%) and injection (43.27%). The injury proportion was lowest when students opened the needle cap (10.00%) (Table 2).

Consequences of needle stick injury

Some reviews highlighted the effects of needle stick injuries among students. Most of the articles stated that those who were injured were at higher risks of bloodborne diseases, such as HIV, HBV, and HCV. A study in Germany demonstrated the incidents had led to positive results of HCV (5.3%) and HIV (2.00%) infections (Hoffmann, Buchholz, & Schnitzler, 2013).

Table 1 Needle stick injury (NSI) among nursing students

Country	NSI incidents (%)
India	91.85
Iran	72.05
Turkey	58.45
Taiwan	56.00
Nepal	46.90
United States	38.00
Brazil	29.05
Uganda	25.30
Germany	24.63
Namibia	17.00
South Africa	16.00
The Netherlands	11.00
Hong Kong	1.60

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