



ISSN: 0975-833X

## RESEARCH ARTICLE

### DETERMINING THE PREVALENCE AND AWARENESS OF NEEDLESTICK INJURIES AMONG DENTAL HEALTH PROFESSIONALS IN RIYADH, SAUDI ARABIA

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#### ARTICLE INFO

##### Article History:

Received 03<sup>rd</sup> October, 2014  
Received in revised form  
05<sup>th</sup> November, 2014  
Accepted 17<sup>th</sup> December, 2014  
Published online 31<sup>st</sup> January, 2015

##### Key words:

Insufficient,  
Experienced,  
Professionals.

#### ABSTRACT

There is a strong association between needlestick injuries and spread of infectious diseases. Dental health professionals are at constant risk of having these diseases. This research was designed to measure knowledge and awareness of needlestick injuries among dental health professionals in Riyadh. Data was collected from 777 participants who filled up a closed ended question format. Almost half of the participants reported one NSI during 12 months prior to the study, a few having experienced two or three and remaining with no injury experience. Insufficient clinical experience was reported to be the most common reason behind NSIs.

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#### INTRODUCTION

Research in several countries indicates that certain infectious diseases among health care workers are caused by needlestick injuries (NSIs). Poorly observed universal precautions (e.g. using gloves and disposing sharps) that students' education on safe practices need to be more rigorous (Rosenthal *et al.*, 1999). Accidental needlestick and sharps injuries continue to be serious workplace hazards for health care workers. Africa and Southeast Asia was found to have the highest incidence of NSIs (Wilburn, 2004). Although life threatening, they remain a common yet underreported occupational hazard suggesting the need for increased awareness, training and education of health care workers (Jahan, 2009), particularly since they can be prevented by strictly adhering to universal precautions (Lee and Noor Hassim, 2005). Cross contamination from NSIs that occur frequently during medical training can be prevented by obtaining complete vaccination against hepatitis V early in medical training (Deisenhammer *et al.*, 2006). Successful prophylaxis requires careful pre-planning and while all practices should have safeguard policies, prevention remains most effective (Smith *et al.*, 2001). The work environment, workload and organizational climate influence hospital nurses' likelihood of sustaining NSIs. Resolving understaffing, inadequate administrative support and poor morale issues could reduce NSIs (Clarke *et al.*, 2002).

Medical students with NSIs have a significantly higher risk of exposure to transmissible pathogens including hepatitis B virus, HIV and hepatitis C virus. The incidence rate of hepatitis B is considerably high among clinical hospital staff and almost universally obtained among medical and dentistry students (deVries and Cossart, 1994).

Structured prevention training for occupational exposure to blood -borne diseases (BBD) improved knowledge and practice, reducing the number of NSIs among Chinese student nurses (Wang *et al.*, 2003). They are also common though often unreported among surgeons in training. Improved prevention and reporting strategies are needed to increase occupational safety for surgical providers NSIs (Makary Makary *et al.*, 2007).

An overall high NSI rate from routine hospital procedures was found to vary based on medical discipline. Implementation of safety measures resulted in improved health and safety of medical staff (Wicker *et al.*, 2007). Simple changes, such as insisting on disposable needles could reduce the need for recapping needles and over the risk of NSIs among health care workers (Jagger *et al.*, 1988). Awareness programs addressing transmission of blood-borne infections, standard precautions and prevention strategies must be provided by health care agencies (Askarian and Malekmakan, 2006).

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**MATERIALS AND METHODS**

**Sample and Study Design**

Participants were dental health workers primarily from hospitals situated in Riyadh city. Data were collected between February 1 and April 10, 2013. We conducted a cross-sectional study using a closed-ended question format. Of the 777 participants, dental consultants comprised 10%, specialists 17%, general practitioners 15%, workers in sterilization areas 21%, dental interns 25% and dental students 14%. Questionnaires were distributed through each hospitals area supervisors. The questionnaire collected work-related information such as position and work experience. Detailed questions on knowledge about occurrence of needlestick hazards in clinical practice NSIs within the 12 months prior to the study were included. Particular emphasis was given to existing prevention and post injury management.

**RESULTS**

The participants' response rate was 90%. The proportion of respondents who disclosed that they did not recap needles after use was 23%. Of the 33% who experienced NSIs during the 12 months prior to the study, 42% had suffered one injury; 30%, 2 injuries; 20%, three injuries and 10% had more than three injuries. When asked about possible causes, 16% stated inadequate assistance; 35%, insufficient clinical experience; 24%, fatigued; and 25%, haste (Table 2 and 3).

**Table 1. Participants' hospital positions**

Professionals	Frequency	Percent
Student	109	14.0
Intern	189	24.3
Work in steri area	160	20.6
General dentist	114	14.7
Specialist	127	16.3
Consultant	78	10.0
Total	777	100.0

**Table 2. Participants with and without needlestick injury during the 12 months prior to the study**

Had needle injury	257	33%
No needle injury	507	67%

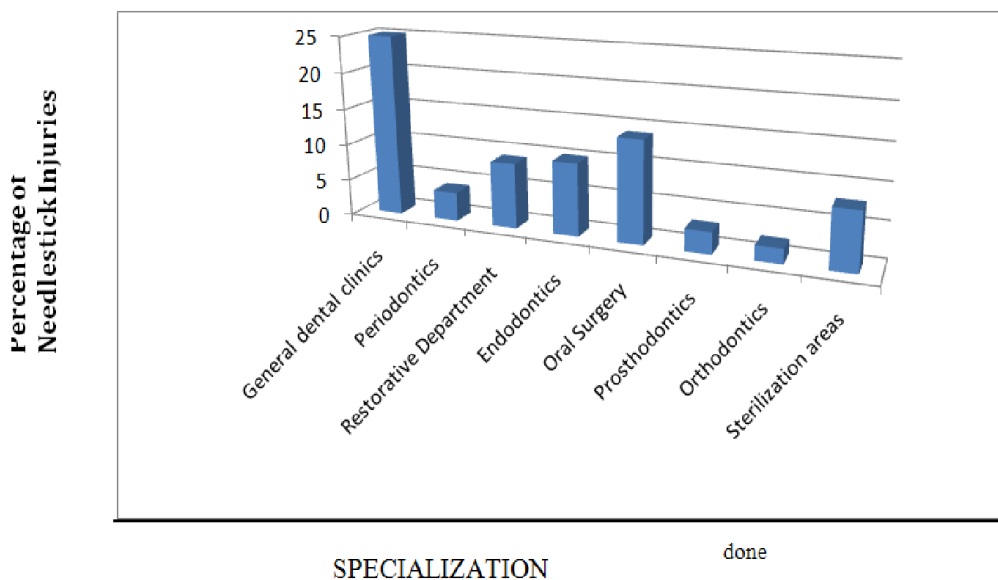
**Table 3. Reported causes of needlestick injuries**

Inadequate assistance	16%
Insufficient clinical experience	35%
Fatigue	24%
Haste	25%

With regard to reporting NSIs, 20% reported the incident to clinic supervisors, 18% to occupational health officers, 34% to infection control officers, 40% did not report the incident at all, and 18% could not remember reporting the incident to anyone. The majority of NSIs took place in general dentistry clinics (25%), followed by oral surgery (16%), endodontics (11%), restorative dentistry (9%), sterilization areas (8%), periodontics (4%), prosthodontics (3%) and orthodontics (2%) (Fig 3). When asked about hepatitis B vaccination, the respondents reported that 48% were fully inoculated, 30% were not, and 22% were unsure.

**DISCUSSION**

The results revealed that the prevalence of NSIs is high among dental professionals and dental auxiliaries. Although the majority of the participants in this study seemed to be aware of the risks and consequences of exposure to NSIs during dental procedures, there is room for improvement. The dental professionals can arrange and take part in workshops related to prevention of NSIs and knowledge regarding the resulting diseases. Dental hospitals and clinics should follow the occupational safety rules and regulations to decrease if not eliminate NSIs. For questions designed to determine whether participants realized the seriousness of NSIs within their daily work routine, respondents acknowledged that infectious diseases such as hepatitis B and HIV, were most likely to be spread through NSIs (Fig. 2).



**Fig. 1. Needlestick injuries among various dental practitioners**

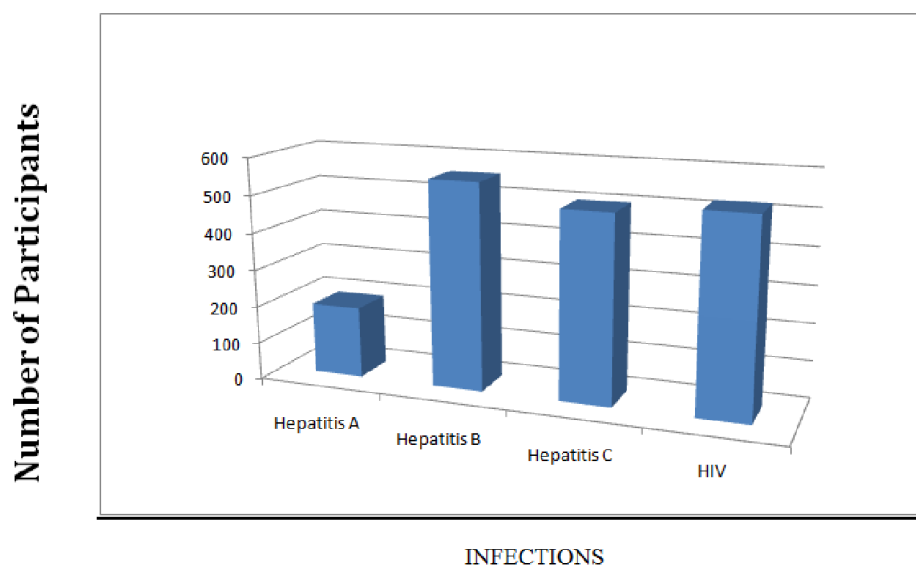


Fig. 2. Participants' awareness of blood borne infectious disease transmission through needlestick injuries

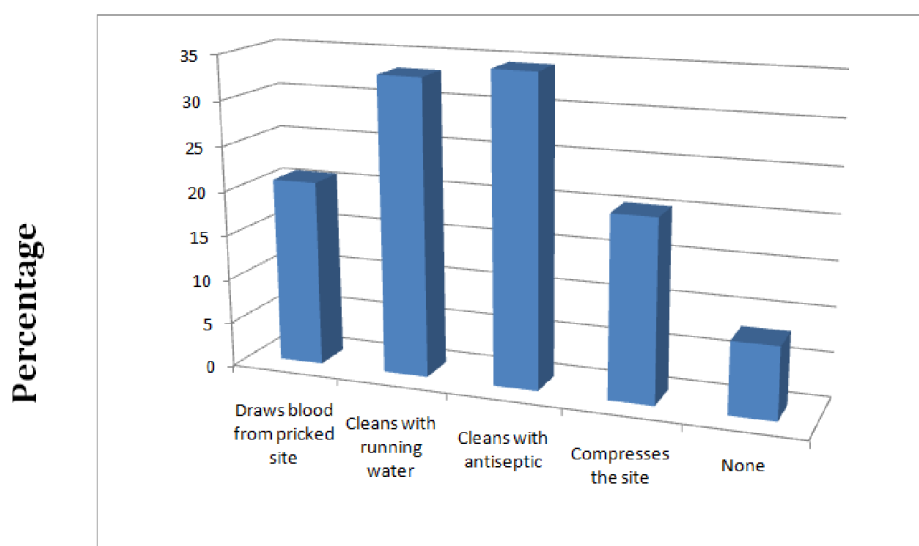


Fig. 3. Post Injury Reactions

Participants included final year dental students, interns, general practitioners, specialists, consultants and workers in sterilization areas as they are exposed daily to used needles more than anyone else. All hospitals, especially dental clinics should follow International Labour Organization Standards for Occupational health and safety. Positive results can be achieved if proper training is provided to dental professionals and auxiliaries before or during their clinical exposure. This study revealed that one third of dental professionals ( $n=257$ ) had experienced at least one NSI within the 12 months prior to the study. It should also be noted that the highest number of injuries occurred in general dental clinics, followed by oral surgery; the least were reported from orthodontics. With respect to respondents' actions following any NSI in clinics or sterilization areas, 35% stated they clean the injury site with an antiseptic, 34% with running water and 21% drew out blood from the pricked site (Fig. 1).

The most frequently cited reasons for NSIs, in order, were insufficient clinical experience, fatigue and performing dental procedures in a hurry (Fig. 1). There is a need to improve awareness about NSIs and prevention in order to reduce its occurrence among dental professionals. Simple preventive measures encouraged through training programs can help achieve this. Hospitals, especially teaching hospitals should arrange such programs so that the students can learn to cope with the risks to which they would be exposed.

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