The Scientific Journal of University of Benghazi

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The Prevalence of Needle Stick Injuries among Dental Students, University of Benghazi, Libya

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Received: 26/3/2020; accepted: 26/7/2020

الملخص

المقدمة: يتعرض أطباء وطلاب طب الأسنان لخطر الإصابة بالأدوات الحادة، ومن بين أكثر الإصابات شيوعا هي الوخز بحقنة التخدير الموضعي المستخدمة في عيادات الأسنان، مما يزيد من خطر الإصابة بالأمراض المنقولة عن طريق الدم مثل مرض التهاب الكبد الوبائي ومرض نقص المناعة المكتسبة .الهدف: تهدف هذه الدراسة إلى تحديد مدى انتشار ونمط الإصابة بالأدوات الحادة المستخدمة في العلاجات السنية بين طلاب كلية طب الأسنان، جامعة بنغازي، ليبيا.

الطريقة والأساليب: أجريت دراسة مقطعية وصفية بين جميع طلاب الكلية والذين انخرطوا في حصص سريرية (السنة الثالثة، السنة الرابعة، وأطباء الامتياز) في كلية طب الأسنان، جامعة بنغازي. وتم استطلاع آراء الطلاب حول مدى انتشار ونمط الاصابات بحقن التخدير الموضعي والادوات الحادة. وذلك باستخدام استبيان تم اختباره مسبقًا ومدار ذاتيًا وقد تم جمع البيانات وتحليلها باستخدام برنامج SPSS .

النتائج: تعرض حوالي ثلث الطلاب والذين شملتهم الدراسة للإصابة منذ بداية تدريبهم السريري في كلية طب الأسنان. وكان إعادة غطاء الحقنة هو السبب الأكثر شيوعا. وقد بدا ان 73.3% منهم مدركين للتدابير والإسعافات الأولية عند الإصابة بوخز الحقنة.

الخلاصة والتوصيات: نظام التدريب وممارسة العمل المناسب والتعليم المستمر فيما يتعلق بالتوعية بإصابات الحقن والادوات الحادة له الأهمية القصوى في خلق الوعي لدى الطلاب. ويجب عرض خطوات وسياسات الوقاية من هذه الإصابة في كل الأقسام السريرية لضمان الممارسة الآمنة. التوصية بشده على تطعيم التهاب الكبد الوبائي ب لجميع طلاب طب الأسنان قبل البدء في التدريب السريري لتقليل مخاطر الإصابة بفيروس التهاب الكبد الوبائي من خلال الإصابات بالحقن والأدوات الحادة.

الكلمات المفتاحية: الإصابة بوخز الحقنة، طلاب طب الأسنان.

Abstract:

Introduction: Dentists and dental students are at high risk of injuries by sharps and of these, the most common are due to needle sticks. Needle-Stick Injures (NSIs) increase the risk of having blood-borne infections such as Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and Human Immunodeficiency Virus (HIV) infections.

Aims: The aim of this study was to determine the prevalence and pattern of (NSIs) among dental students at Faculty of Dentistry, Benghazi – Libya.

Methods: A descriptive cross sectional study was conducted among all dental students who were in clinical rotations (third year, fourth year and interns) at Faculty of Dentistry, University of Benghazi. Students were surveyed for the prevalence and pattern of (NSIs) using a pre-tested, self-administered questionnaire. The data was collected and analyzed by using SPSS software.

Results: About one third of the students had at least one accidental exposure to (NSIs) since the beginning of their dental training. Needle Recapping was the most common cause of such injury. Most of dental students (73.3%) were found to be aware of precautionary measures and first aid management for a (NSIs).

Conclusion and Recommendations: Proper training system, proper work practices and education regarding awareness of needle stick injuries have the prime importance of creating awareness. The prevention and management protocol for such injury should be displayed in all clinical departments to assure safe practicing. HBV vaccination should be strongly recommended for all dental students before beginning clinical rotations to reduce the risk of HBV infections through needle stick injury.

Key words: Needle stick injury, Dental students.

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1. INTRODUCTION

Health care associated infection has always been an important public and medical issue worldwide. Health care workers (HCWs) are at expanded danger of contracting blood-borne diseases in their daily work through job related factors like accidental needle-stick injuries (NSIs). NSIs are injuries caused by accidental penetration of the skin by an injection needle [1].

Globally, NSIs are the most widely recognized occupational hazards for blood exposure which result in transmission of blood-borne infections [2, 3].

The majority of dental practices are being performed under local anesthesia, so hazard expanded by continuous utilization of local anesthesia needles. This has been known for the past few decades to be the founders of several blood borne diseases such as Hepatitis B (HBV), Hepatitis C (HVC) and AIDS (HIV) [4, 5].

More than 20 different diseases can be transmitted through needle sticks, including syphilis, malaria, and herpes [6]. At least 1,000 health care workers are estimated to contract serious infections annually from needle stick and sharps injuries [7].

Several studies have reported the high prevalence of such practice among dental students and dental surgeons. Dental students in training have the greatest risk of exposure to blood borne pathogens, because of their various training including the utilization and transfer of sharp instruments and preparations increased while training new clinical skills [8, 9].

Although needle-stick injury among dental students care workers has been explored in several industrialized nations, very few data are available from developing countries. No data have been reported on needle-stick injuries among dental students in Libya. Therefore, this study was conducted to determine the prevalence and pattern of (NSIs) among undergraduate dental students at University of Benghazi, Libya.

Material and Methods:

A Self- administered close ended questionnaires was distributed to all dental students who are in clinical rotations (third year, fourth year and interns) at Faculty of Dentistry, University of Benghazi during the academic year 2017-2018. The students' participation was voluntary after verbal communication explaining the purpose of the study. Demographic status of students such as gender, age and year of study was recorded, also exposure of the subjects to the needle stick injury (Yes/ No). If answer was "yes" then it required the mechanism of the injury like local anesthesia administration, needle recapping, needle exchange, sharps disposal or others. Subjects were also asked few questions regarding precautionary measures necessary to prevent needle stick injury and whether he or she was aware of the first aid management of a needle stick injury. The dental students were given the questionnaire in the classrooms and asked to fill it without discussing it in fifteen minutes. Interns were given the same questionnaire in various departments. The data were entered and tabulated into a computer using the Statistical Package for Social Science (SPSS Version 20 for Windows, SPSS Inc. Chicago, IL). Data analysis included descriptive statistics.

Results:

We disseminated 390 questionnaires, out of which 342were returned, giving a response rate of 87.6%. The study population comprised of 192 students from third year (56.2%), 64 students from fourth year (18.7%) and 86 interns (25.1%) (Table 1).

Exposure to needle stick injury was found among 108 of subjects (31.6%). Interns had the highest rate of NSIs (54.2%) followed by fourth year (27.4%), while third year students had the lowest percentage (22.3%) (Table 2).

The most common activity leading to NSIs was needle recapping (37.1%), followed by other reasons which could be suturing or handling sharp instruments (29.2%) (Figure 1).

Most of the students (73.3%) were aware about the proper management and the first aid after NSIs (Figure2).

Table 1: Demographic characteristics.

Variables		No.	%
Gender	Male	28	8.1
	Female	314	91.9
Year	3rd	192	56.2
	4th	64	18.7
	Interns	86	25.1

Table 2: Exposure to needle stick injuries.

Exposure to needle stick	Third year	Fourth year	Interns	Total
Yes	44 (22.3%)	17 (27.4%)	47 (54 .2%)	108 (31.6%)
No	133 (69.7%)	37 (58.1%)	34 (39 .8%)	204 (60%)
Do not remember	15 (7.4%)	10 (14.5%)	5 (6.0%)	30 (8.7%)

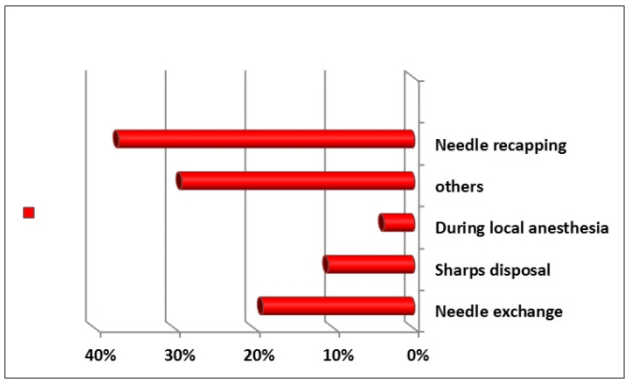


Figure 1: Mechanism of injury

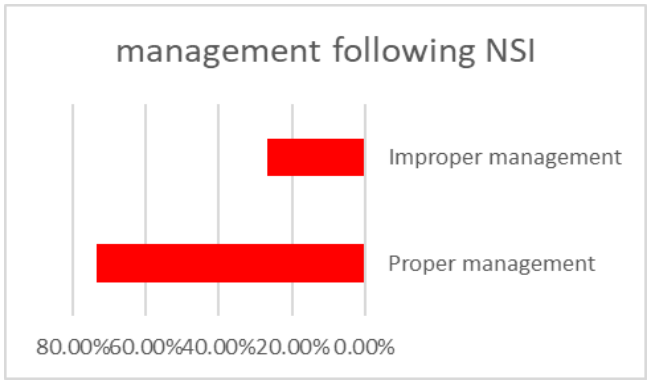


Figure 2: First aid and management after NSIs

Discussion:

This cross-sectional study investigated needle-stick injuries only among dental students, in contrast to most other studies which evaluated needle-stick injuries among health care workers in general.

Needle stick injuries pose significant risk to dental health care workers. Dentists are a part of group at high risk of exposure to this type of accident, [10, 11] which is pronounced among dentistry students due to their few work experiences.

The prevalence of NSIs was 22.3 %, 27.4%, 54.2%, for third year ,fourth year and interns respectively. It is assumed that little practical experience and reduced clinical skills of students [10, 12] added to the psycho-emotional factors, nervousness, anxiety and pressure for being constantly evaluated, may have influenced the high number of cases in this population. In addition, most curricula in dentistry schools involve clinical activities increasing the likelihood of accidents in this environment. This rate is less than reported in other studies [4, 13]. The underreporting is an established fact because, "HIV, HBV and HCV" infections have implications for personal relationships and future employment. Also since the study only focused on self-reported events, we believe that the actual incidence was much higher.

Needle recapping was found the most common mechanism of NSIs, which is in consistent with other studies [14, 15] earlier reports [16] have shown that the classical NSIs usually take place during recapping of the used dental needles. The reported incidence of NSIs caused by this mechanism is between 22% and 52% of needle-stick injuries. This finding may be due to that high rate of needle recapping using two hands techniques, in addition needle devices with safety features are expensive and not always available.

The use of a portable recapping device has been shown to decrease NSIs fourfold, from 1 in 4,000 to 1 in 16,000 injuries per blood drawing event [17], but obviously introduction of such equipment is not widely adopted owing to the added cost and administrative effort needed for implementation.

The increased rate of NSIs reported among interns is noticeably higher than among third and fourth years (54.2%). This might be explained by the increased workload, and the clinical requirements, while third year reported less exposure as it is considered as an induction year to the clinical dentistry. The later observation was also reported by Stewardson et al [18].

Most of the students were aware about the first aid management. This finding is in the same line with other studies [4, 11]. This might be due to continuous attention and firm implementation of cross infection control strategies regarding post exposure management in dental training.

One of the limitations of this study is that recall bias may have occurred, especially for events that may have taken place a long time prior to the study.

Conclusion and Recommendation

Our results demonstrate the need to revise the system and establish safety protocols for clinical practice. NSI prevention strategies for dental professionals should be implemented in the dental curriculum and preoccupation/occupational training programs. HBV immunization should be recommended for all dental students before beginning clinical training to limit the danger of HBV infections through needle stick injuries. The prevention and management protocol for such injury should be displayed in all clinical departments to assure safe practicing. A non-recapping policy with immediate disposal of syringe systems after injection would help to reduce the exposure.

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