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Knowledge, Attitude, and Practice of Final Dental Students towards Sharp instruments Injuries, Khartoum State - 2017

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Abstract

Background: *Globally 2 million healthcare workers are exposed to blood borne pathogens each year such as hepatitis B, hepatitis C and human immune deficiency virus,Dental practice represents an occupational hazard for injuries and transmission of serious infections. Dental students are generally considered at a higher risk because they undertake exposure prone techniques during their training years. The aim of this study was to assess the knowledge, attitude and practice of final dental students in Khartoum state.*

Materials & Method: *This was a cross sectional facilities based study. The study populations were composed of final dental students in Khartoum state with a sample of size 385. Self administered questionnaire was used to collect data. The data extracted were tabulated andanalyzed. The results were calculated on the basis of frequency and percentage using SPSS.*

Result: *The response rate was 100% and female constituted 74.55% of the sample. 67.27% of participants were exposed to sharp instruments injury.43.9% were fully vaccinated against hepatitis B .59% of those who participated knew about universal guidelines and most of students90% were aware about diseases transmitted by sharp instruments. The main tool causing injury was needle 59.5%. The local anaesthesia administration was the principle cause of injury 51.2% followed by endodontic treatment.*

Conclusion: *The findings of this study indicated the need for efficient training of dental students that encourages prevention of sharp injuries; compliance with standard precautions; preclinical HBV testing, immunization and efficacy testing; reporting of injuries and follow-up with provision of post exposure prophylaxis.*

Keywords: *sharp instruments, dental students, hepatitis B.*

Abbreviations

HCWs Health Care Workers

HBV Hepatitis B Virus

HCV Hepatitis C Virus

BBV Blood Born Virus

HIV Human Immunodeficiency Virus

WHO World Health Organization

NSIs Needle Stick Injures

Introduction

The effective infection control program in a health care environment is to implements policies and procedures that will protect both workers and patients against transmission of a variety of infectious diseases **[**1**]**. Workplace safety is a very important aspect of occupational health practice the Center for Disease Control and Prevention (CDC) estimated that approximately 800 000 health care workers (HCWs) in the United States were injured by patient needles and about 2000 of those workers tested positive for hepatitis C virus (HCV) infection, 400 for hepatitis B virus (HBV) and 35 for human immunodeficiency virus (HIV) **[**2**]**.

Health care workers are exposed to hazardous blood born pathogen such as hepatitis B, hepatitis c and HIV. These viruses are serious public health problem that can consequence to psychological and occupational disease **[**3**]**. There are more than 20 pathogens are estimated to be transmitted through sharps instruments injuries. The greatest threat to health care worker is HBV, HCV, HIV infection, and others like syphilis, Blast mycosis, Brucellosis, Cryptococcus's, Diphtheria, Malaria, TB, Prions, Ebola, Herpes, Mumps, Rubella, Rubella, Infectious Mononucleosis, Influenza, Swine flu and therefore should be evaluation immediately following treatment of the exposure site by a qualified health care professional **[**7**]**.

Health care workers (HCWs) are at risk of exposure to a variety of blood-borne pathogens by needle stick and Sharp instrument or mucocutaneous contamination. and they susceptible to contracting infectious diseases while providing patient care if they do not use proper infection control procedures **[**5**]**. Sharps instruments injuries are wounds caused by needles and other sharp medical instruments (e.g. scalpel, blades and scissors) that accidentally puncture or cut the skin. Sharps and needles may only cause small wounds in the skin, but the effects can be worse. Such instruments come in contact with blood and other body fluids and may carry the risk of infection **[**6**]**.

Blood-borne viruses (BBVs) can be transmitted occupationally from infected staff to patients, from infected patients to staff, or from patient to patient via contaminated instruments. The most common route of Transmission is from patients with a BBV to a member of staff following a needle sticks and sharp instrument injuries **[**8**]**. Standard precautions include the use of protective barriers such as gloves, waterproof gowns and aprons, water-repellent masks and protective eyewear, which can reduce the risk of exposure of the health-care worker's skin or mucous membranes to potentially infective materials. In addition, under standard precautions, it is recommended that all health-care workers take precautions to prevent injuries caused by needles, scalpels and other sharp instruments or devices **[**3**]**.

It is estimated that there are 35 million healthcare workers (HCWs) worldwide representing 12% of the working population. Two million injuries are believed to occur each year among HCWs. although sharp instruments injuries are preventable **[**11**]**. Dental practice represents an occupational hazard for injuries and transmission of serious infections Healthcare students is exposed to a number of occupational hazards in the workplace and injuries are a major concern. There is a high risk of exposure to pathogens among healthcare students while they become involved in patient's investigation and treatment during their clinical training **[**12**]**.

Dental students are generally considered at a higher risk because they undertake exposure prone techniques during their training years and use sharp instruments more often. Several studies had highlighted that knowledge among dental students was inadequate regarding prevention and management of sharps injuries. Lack of experience and skill in performing dental procedures during clinical training places dental students at risk of exposure to blood borne viruses (BBVs) **[**13**]**.

Occupational exposure is cutaneous injury with contaminated sharp instruments such as needles or contamination of skin or mucosa to patients' blood, saliva or other potentially infectious body fluids (mucocutaneous contamination) **[**14**]**. Blood-borne viruses (BBVs) can be transmitted occupationally from infected staff to patients, from infected patients to staff, or from patient to patient via

contaminated instruments. The most common route of Transmission is from patients with a BBV to a member of staff following a needle sticks and sharp instrument injuries [7].

A needle stick injury is a percutaneous piercing Wound that set by a needle point, but possibly also by other sharp instruments or objects [15]. Health care workers (HCWs) are at risk of exposure to a variety of blood-borne pathogens by needle stick and Sharp instrument or mucocutaneous contamination [16]. 60 % of all injuries occurred in nursing personnel. Most injuries occurred during disposal of used needles (23.7%), during administration of parental injections or infusion therapy (21.2%), drawing blood (16.5%), recapping needles after use (12%), or handling linens or trash containing uncapped needles (16.1%) [17].

Needle stick injury is a significant problem in general practice and exposes general practitioners and practice nurses to a serious risk of infection from blood-borne transmissible agents. All patients should be considered to pose a potentially high risk of infection [15]. Needles and sharps injuries are commonly used during dental procedures; workers in the dental profession are especially prone to sharps-related injuries [18]. These injuries may cause fatal infections with blood-borne pathogens and are a serious occupational safety concern for healthcare workers [19]. Hepatitis B and C and HIV are threatening the health of thousands of healthcare workers. The most common mode of transmission of these diseases is sharp instrument injury [20].

Dental practitioners are more prone to the exposures due to close contact with the patients' oral cavity, frequent use of sharp instruments and working with high-speed rotary instruments that produce con aerosols [14]. Dentists are known to be a high-risk group for exposure to needle stick injuries, and most dentists experience at least one NSI during their Profession life [19]. These exposures predispose to more than 20 microorganisms that cause blood borne infections in which hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) are reported to be the most common [14].

Most studies on the epidemiology of NSI among healthcare workers were focusing on non-dental professionals. The precise risks of NSI in dental healthcare environment were investigated less frequently. The routine use of sharp instruments in dental treatment, the presence of blood and saliva, and the diverse bacterial flora in the oral cavity all contribute to transmit the blood born disease. at a university hospital, dental procedures are frequently executed by students with lower occupational skills, making sharp injures an even more important issue for dental student [21].

Dental schools are responsible for providing appropriate infection control measures, proper training of dental students to protect patients, and for the establishment of safer work conditions [23]. In the

clinical settings, lack of clinical knowledge and inadequate attention to Dental personal safety put students at high risk for occupational exposure to blood-borne pathogens through sharp instruments injuries. So pre-clinical undergraduate students often are prepared for the clinical area with the use of simulations in learning or skills laboratory before treating patients One third of all reported sharps injuries in dental practice are due to the use of no disposable dental syringes with most injuries being sustained during removal and disposal of the disposable needle from the non-disposable plunger **[**24**]**.

The transmission risk is influenced by the type and number of microorganisms present in the blood, presence of visible blood on the needle, depth of the injury and size and type of needle used **[**25**]**. Knowledge of dental students about the risks associated with sharp instruments and the use of preventive measures was inadequate. The implementation of Universal Precautions, elimination of needle recapping, use of safer needle devices, and use of sharps containers for safe disposal will reduce the sharp injure **[**26**]**.

Among dental students, most injuries involved a syringe needle followed by scalar and other dental instruments such as bur, explorer, scalpel, a suture needle and other devices. Recapping a needle and administering local anesthesia, and performing scaling and polishing procedures were the most important causes of sharp injures among dental students. Knowledge about sharp injures only 29% students correctly defined the sharp injures. Only 39% of students had reported the incident and the most common reason for not reported is fear of stigmatization and discrimination and fear of the consequences of such injuries. Despite a comprehensive educational programme and training for dental students, knowledge of inoculation injuries and associated issues remained inadequate. Thus it is important that the principles of infection control training and reporting of all NSIs continue to be emphasized throughout undergraduate dental education **[**29**]**.

This study was about the knowledge, attitude and practice of sharp instrument injuries among final dental students in dental faculties in Khartoum State during 2017.

Methodology

Study Design: This is a Cross sectional facilities-based study.

Study Area: Faculties of dentistry in Khartoum State and there were (khartoum, Nelin, University Of Medical Science And Technology, University Of Science And Technology, and Alribat. International

African university, Sudan international, Watnia, Nile College, Alrazi College Alyarmok College, Medical Science College.)

Study Population: Final Dental students in Khartoum state. (See table 2-1)

Inclusion criteria:

Final dental students present at the time of study

Exclusion criteria:

- Absent student at research time
- Those who refuse to participate

There are 13 dental faculties (see the table below). The sample was distributed proportional to number of final dental students in each faculty as shown in the following table:

NO	Faculty	Number of final students	Sample size
1	Khartoum	136	62
2	Elneelain	39	18
3	University Of Sciences and Technology	55	25
4	Alribat	92	42
5	Academy Of Medical Science	69	32
6	Karari	73	33
7	International Africa University	67	31
8	Sudan International	66	30
9	National University	52	24
10	Nile College	36	17
11	ElraziUniversity	60	28
12	AlyarmokCollege	44	20
13	Medical Science College	50	23

Total	**839**	**385**

Table 1: Distribution proportion to number of final dental students in each faculty in Khartoum state 2017

Sampling Technique:

Systemic random sampling technique was used, in each faculty list of students was obtained. The first student was selected randomly. When students wasdivided by sample size in the faculty to get the sample interval then the second student was taken after counting for this interval and so on till sample was completed.

Data Collection Tools and Method:

Self-administered questionnaire was distributed to final dental students in facilities of dentistry in Khartoum State. A pilot study was conducted among a sample of other medical students (not part of the study) to pre-test the questionnaire to insure reliability and comprehensibility.

Data Analysis:

The collected data wascleaned, coded, entered in master sheet and analyzed by statistical package for social science (IBM SPSS Inc. Chicago, version no 23) software.

Chi –square test was used for comparing categorical data; level of significance was set at 0.05 or less, the tables were constructed using Microsoft word.

Results

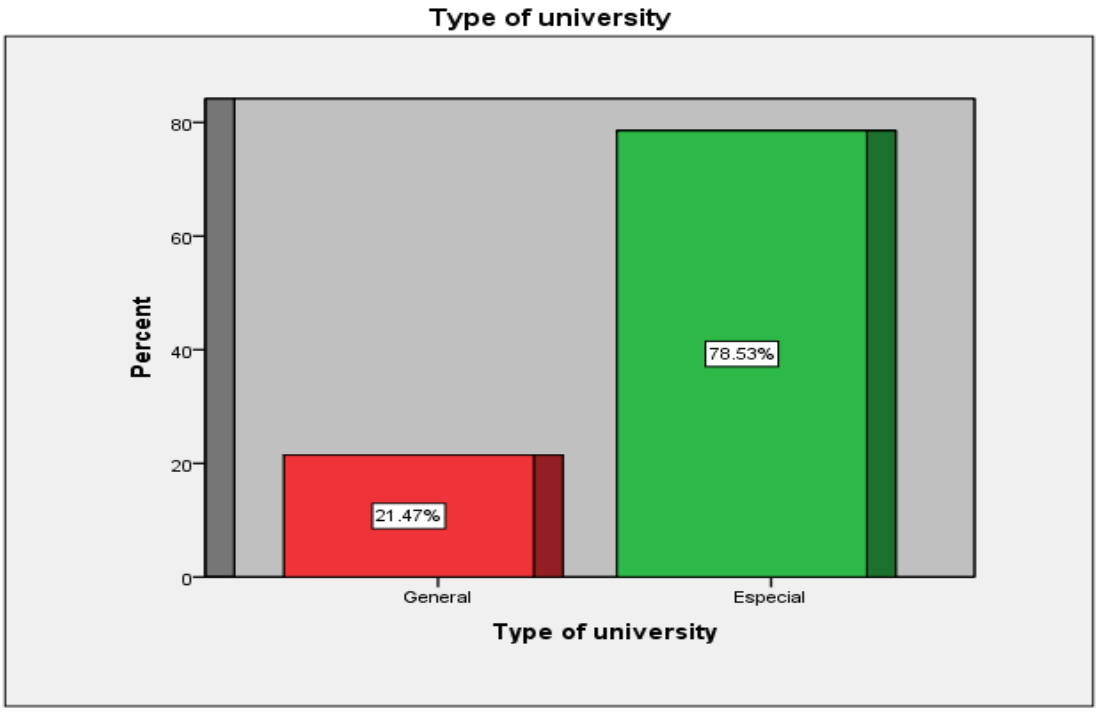

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Figure.1: Distribution of final dental students by type of University, Khartoum State, 2017.

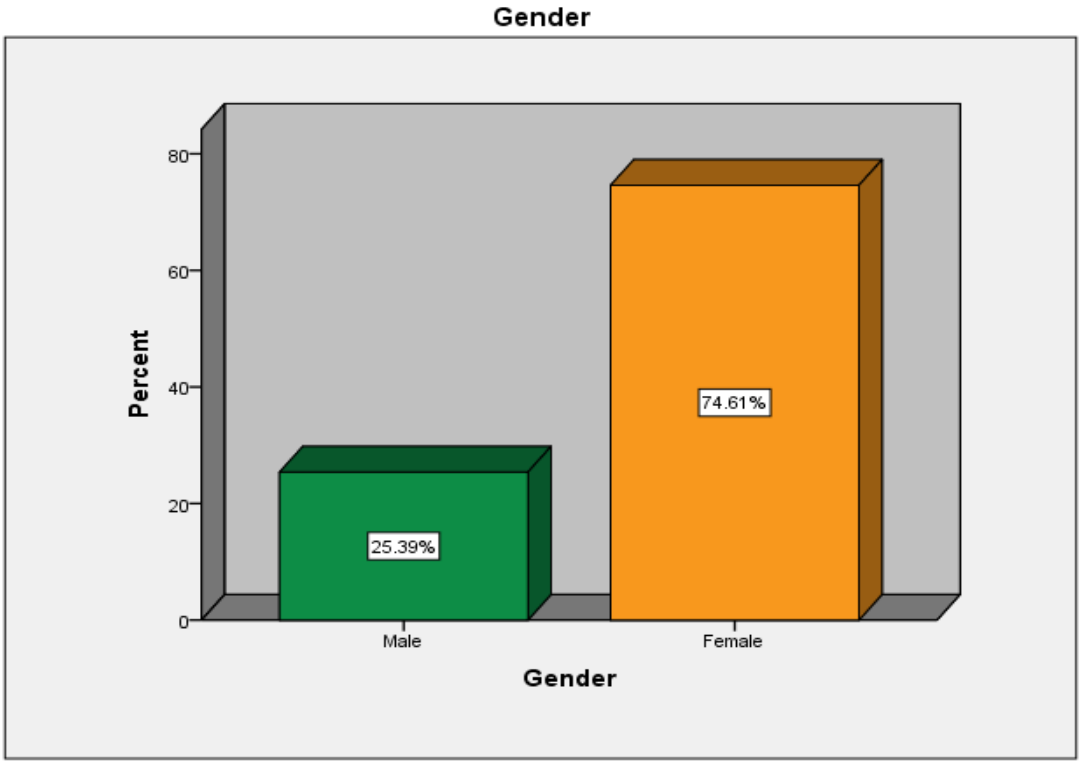

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Figure 2: Distributionsof final dental students by gender, Khartoum State,2017.

Knowledge of Final Dental Students towards Sharp Instruments Injury:

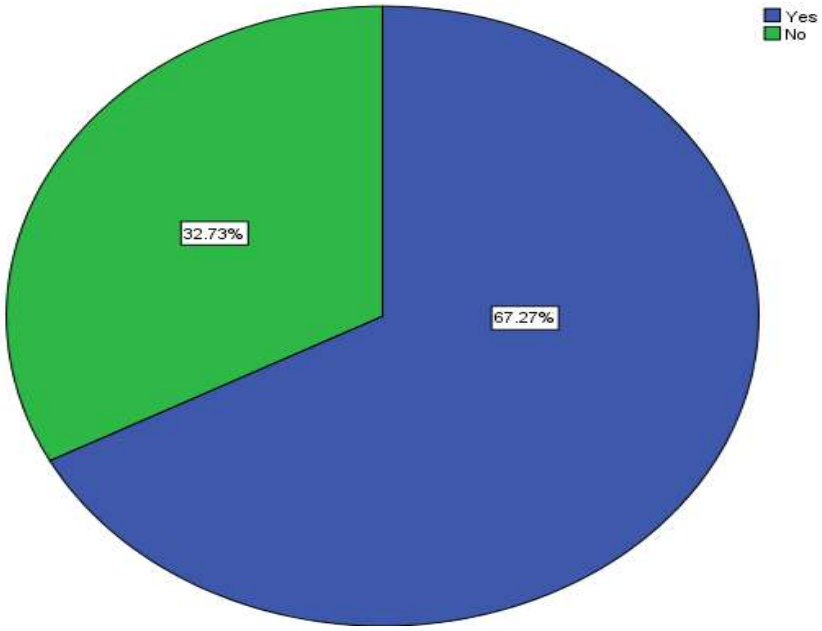

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Figure 3: Distribution of final dental students by whether had contaminated sharp instruments injury. Khartoum State, 2017.

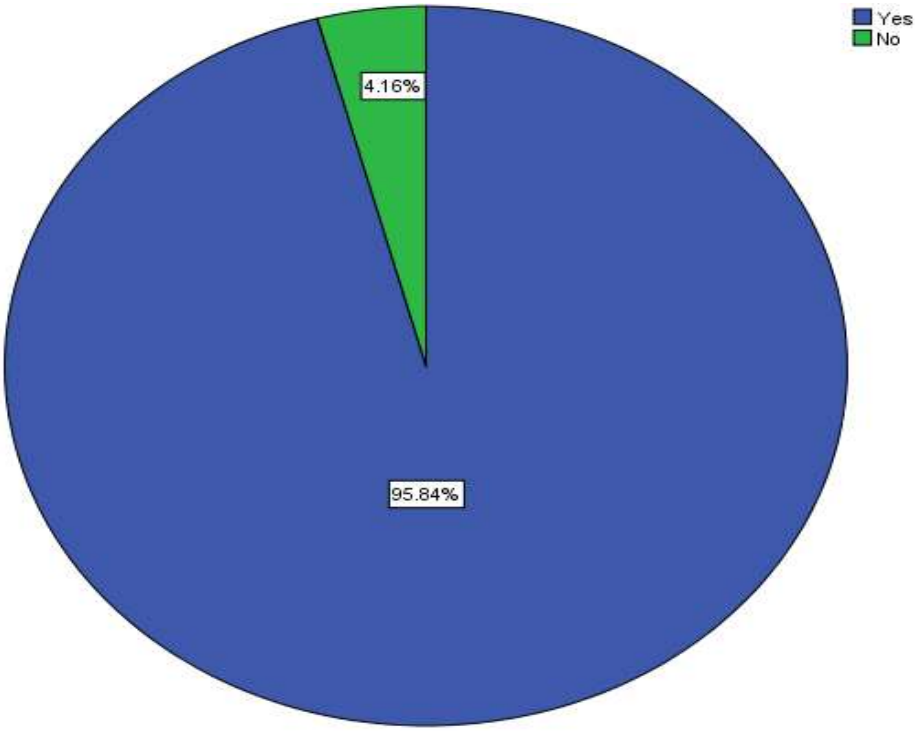

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Figure 4: proportion of final dental students by thinking about sharp instruments injury transmitted disease or not, Khartoum state 2017

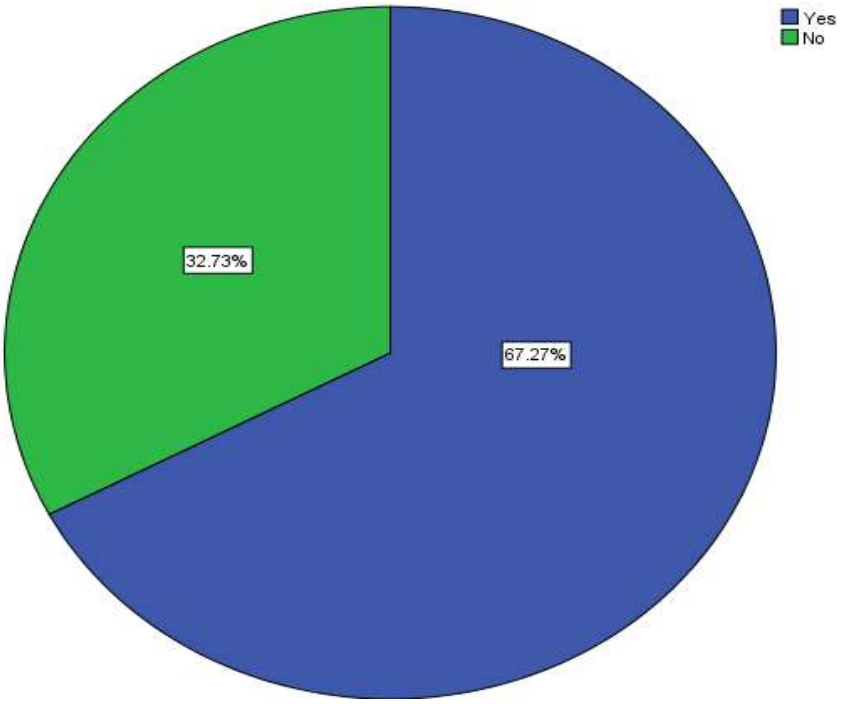

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Figure 5: Distribution of final dental students by knowledge about universal guidelines, Khartoum State 2017

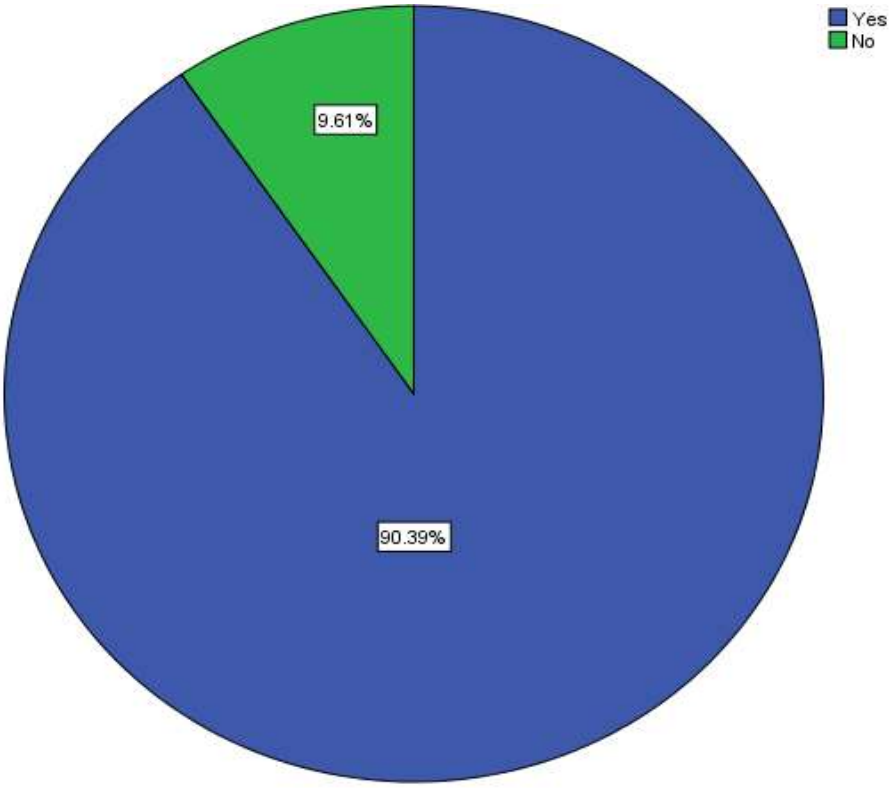

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Figure 6: Distribution of final dental students by awareness of diseases caused by sharp instruments injury, Khartoum State 2017.

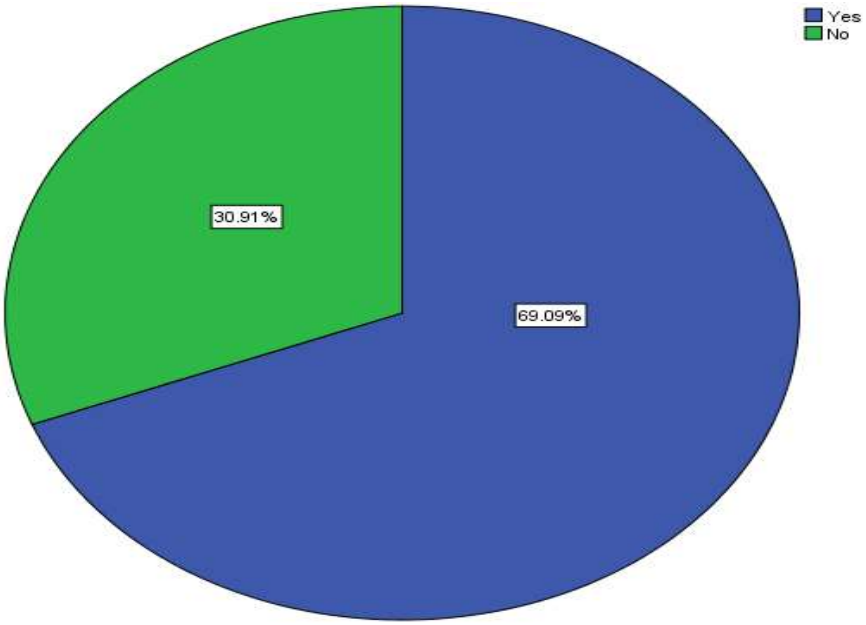

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Figure 7: Distribution of final dental students by weather attended infection control programs\conference, Khartoum State, 2017.

Diseases	Frequency	Percent
Hepatitis B	150	39.0
Hepatitis C	17	4.4
HIV	71	18.4
Tuberculosis	2	0.5
Hepatitis B, Hepatitis C, HIV	69	17.9
HIV, Hepatitis B , Tuberculosis	8	2.1
Hepatitis B, Hepatitis C &Tuberculosis	6	1.6
Hepatitis B &HIV	62	16.1
Total	385	100.0

Table1: Distribution of final dental students by which most common diseases transmitted by sharp instruments injury, Khartoum State, 2017.

Response	Frequency	Percent
Agree	236	61.3
Disagree	43	11.2
No opinion	106	27.5
Total	385	100.0

Table 2: Shows that Distribution of final dental students about if hepatitis B persists up to seven days on medical devises or not, Khartoum State, 2017.

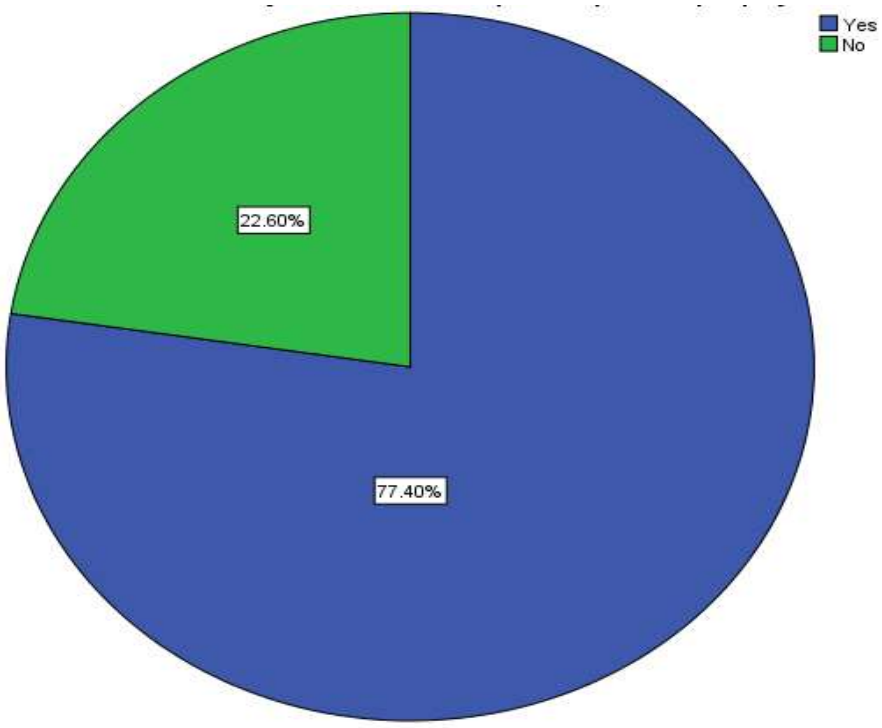

Figure 8: Distribution of final dental students by awareness of post exposure prophylaxis, Khartoum State, 2017.

Attitude of Final Dental Students towards Sharp Instruments Injury:

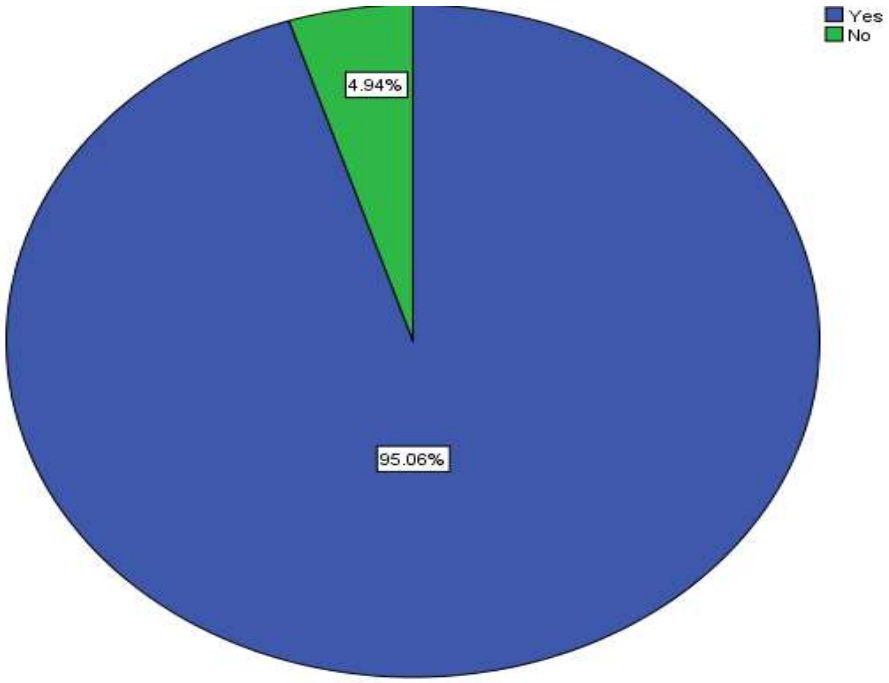

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Figure 9: Distribution of final dental students by thinking that hepatitis B vaccination is mandatory for dental student or not, Khartoum State, 2017.

Response	Frequency	Percent%
Due to work load	138	35.8
Lack of experience	75	19.5
Carelessness	142	36.9
Knowledge deficit	30	7.8
Total	385	100

Table 3: Distribution of final dental students by the main reason of sharp instruments injury, KhartoumState, 2017.

Response	Frequency	Percent %
Not knowing how or to whom report injury	170	44.2
Self care	113	29.4
Injury was minor	44	11.4
Item was unused	18	4.7
Being busy	40	10.4
Total	385	100.0

Table 4: Distribution of final dental students about the main reason for not reporting injury, Khartoum State, 2017.

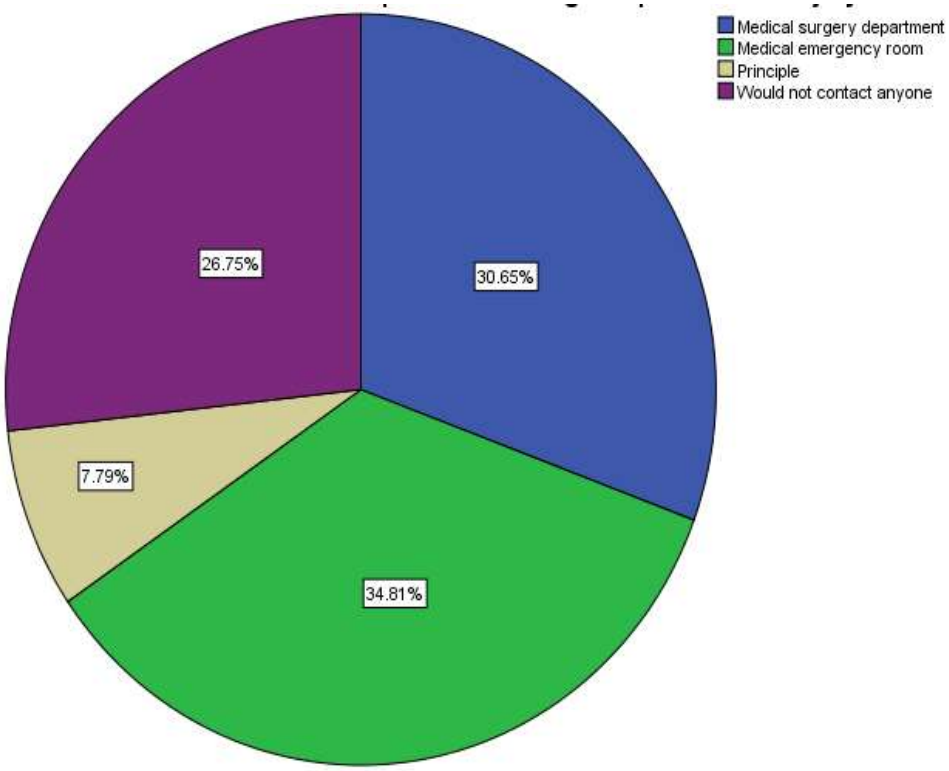

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Figure 10: Distribution of final dental students about who's the first consulted after sharp instruments injury, Khartoum State, 2017.

Practice of Final Dental Students towards Sharp Instruments Injury:

Response	Frequency	Percent%
Yes	333	86.5
No	52	13.5
Total	385	100.0

Table. 5: Distribution of final dental students by who had hepatitis B vaccination in Khartoum State, 2017.

Response	Frequency	Percent%
Less than 3	52	13.5
2-3 doses	128	33.2
3 doses and booster doses	169	43.9
Don't remember	36	9.4
Total	385	100.0

Table. 6: Distribution of final dental students by how many doses of hepatitis B vaccination were taken, Khartoum States, 2017.

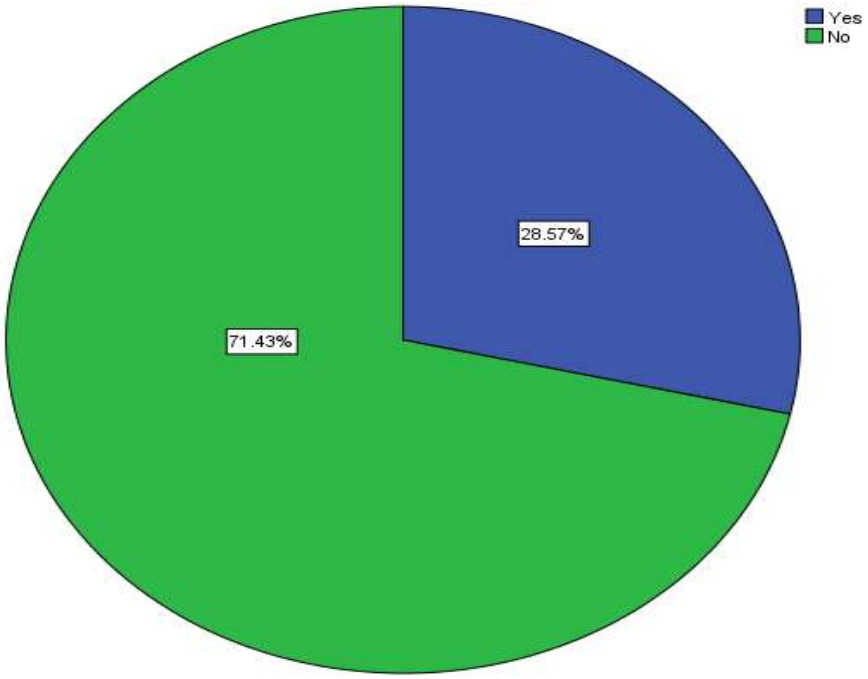

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Fig 11: Distribution of final dental students by weather tested for hepatitis B vaccine immunization, Khartoum State, 2017.

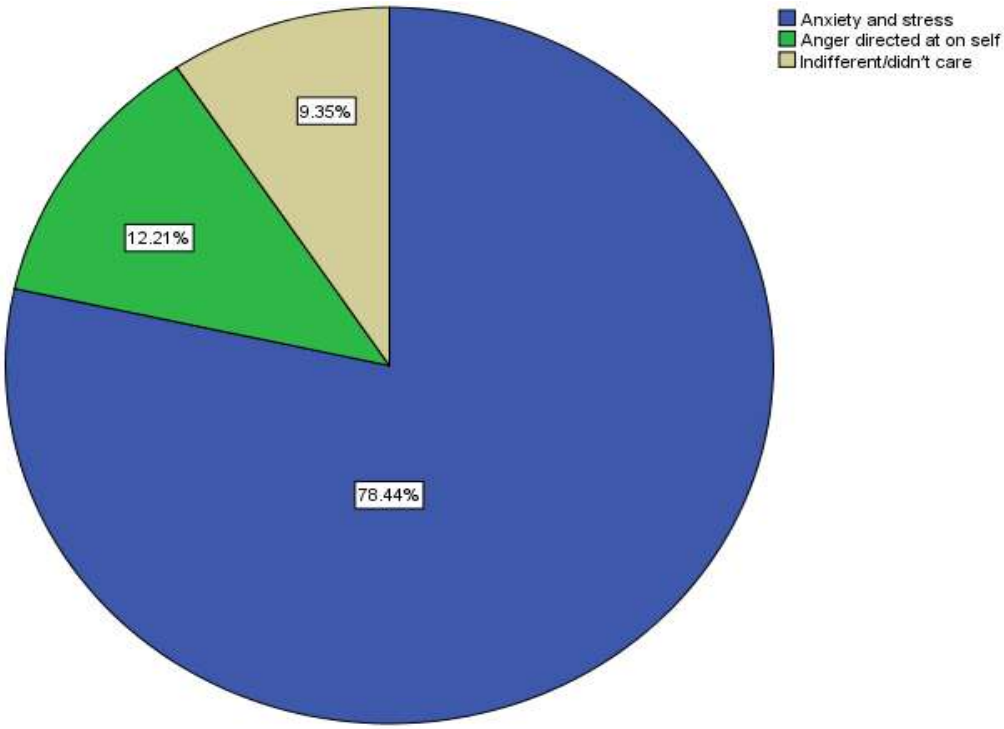

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Figure 12: Distribution of final dental students by what was the immediate reaction after injury, Khartoum State, 2017.

Response	frequency	Percent %
Personal protective		
yes	288	74.8
No	97	25.2
Gloves		
Yes	369	95.8
No	16	4.2
Mask		
Yes	372	96.6
No	13	3.4
Needle recapping		
Single handed	296	76.9
Double handed	89	23.1
Use ofSafety box		
Yes	351	91.2
no	34	8.8
Total	385	100.0%

Table 7: Shows distribution of final dental students by adherence to standard precaution, Khartoum State, 2017.

Response	Frequency	Percent
Needle	229	59.5
Endodontic file	21	5.5
Explorer	5	1.3
Orthodontics wire	6	1.6
Scalar	8	2.1
Bur	15	3.9
Suture needle	4	1.0
Surgical elevator	4	1.0
Total	385	100

Table 8: Distribution of final dental students by the most common instrument that cause injury, Khartoum State, 2017.

Response	Frequency	Percent
Endodontic treatment	51	13.2
Scaling	45	11.7
Local anesthesia administration	101	26.2
Needle recapping	54	14.0
Needle exchange	23	6.0
Sharp instruments disposal	6	1.6
Washing of sharp instrument	13	3.4
Total	385	100.0

Table 9 :Distribution of final dental students by the most common clinical activity that causes sharp instruments injury, Khartoum State, 2017.

Relationship between Genders and Knowledge towards Sharp Instruments Injury:

Variables	Gender		P value
	Male	Female	
Do you have ever contaminated sharp instrument injury?			
Yes	68(17.7%)	191(49.6%)	0.605
No	30(7.8%)	96(24.9)	

Table .10: Relation between genders of finaldental students towardswho has sharp instruments injury, Khartoum State, 2017.

Variables	Genders		P value
	Male	Female	
Do you know about universal guidelines?			
Yes	50(13%)	177(46%)	0.046
No	48(12.5%)	110(28.6%)	

Table 11: Relation between genders of final dental students towards universal guidelines, Khartoum, State, 2017.

Variables	Type of university		P value
	Male	Female	
Are you aware of the diseased caused by sharp instruments?			
Yes	88(22.9%)	260(67.5%)	0.817
No	10(2.6%)	27(7.0%)	

Table 12: Relations between genders of final dental students towards awareness about diseases caused by sharpsinjury, Khartoum State, 2017.

Variables	Gender		P value
	Male	Female	
Did you attend any infection control programmed			
Yes	66(17.1%)	200(51.9%)	0.665
No	32(8.3%)	87(22.6%)	

Table 13: Relation between genders of final dental students toward attending infection control programmed, Khartoum State, 2017.

Variables	Gender		P value
	Male	Female	
Are aware of post exposure prophylaxis?			
Yes	81(21.0%)	217(56.4%)	0.073
No	17(4.4%)	70(18.2%)	

Table 14: Relation between genders of final dental students towards post exposure prophylaxis reaction, Khartoum State, 2017

Variables	Gender		P value
	Male	Female	
Do you think contaminated sharp instruments transmitted disease?			
Yes	95(24.7%)	274(71.2%)	0.032
No	3(0.8%)	13(3.45%)	

Table 15: Relation between genders of final dental students towardsthinking about contaminated sharp instruments injury transmitting diseases, Khartoum State.2017.

Variables	Gender		P value
	Male	Female	
Hepatitis B virus persists for seven days on medical devices?			
Agree	62(16.1%)	174(45.2%)	0.075
Disagree	7(1.8%)	36(9.4%)	
No opinion	29(7.5%)	77(20.0%)	

Table 16: Relation between genders of final dental students towards hepatitis Bvirus persists for seven days on medical devices, Khartoum State, 2017.

Relationship between genders and attitude of final dental students towards sharp instruments injury:

Variables	Gender		P value
	Male	Female	
Do you think hepatitis B vaccination is mandatory for dental students?			
Yes	90(23.4%)	276(71.7%)	0.087
No	8(2.1%)	11(2.9%)	

Table 17: Relation between genders of final dental students toward thinking if hepatitis B vaccination is mandatory for all dental students, Khartoum state, 2017.

Variables	Gender		P value
	Male	Female	
The main reason for sharp instruments injury ?			
Due to work load	33(8.6%)	105(27.3%)	0.085
Lake of experience	21(5.5%)	54(14.0%)	
carelessness	33(8.6%)	109(28.3%)	
Knowledge deficit	11(2.9%)	19(4.9%)	

Table 18: Relations between genders of final dental students towards the reason for sharp instruments injury, Khartoum State, 2017.

Variables	Gender		P value
	Male	Female	
More emphasis and training during dental curriculum and education denial program			
Yes	87(22.6%)	247(64.2%)	0.035
No	11(2.9%)	40(10.4%)	

Table 19: Relation between genders of final dental students towards thinking about infection control emphasis during dental curriculum, Khartoum State, 2017.

Variables	Gender		P value
	Male	Female	
Reason for not reporting injury?			
Not knowing how and to whom report	42(10.9%)	128(33.2%)	0.115
Self care	35(9.1%)	78(20.3%)	
Injury was minor	6(1.6%)	38(9.9%)	
Item was un used	5(1.3%)	13(3.4)	
Being busy	10(2.6%)	30(7.8%)	

Table 20: Relation between genders of final dental students towards reason for not reporting injury, Khartoum State, 2017.

Variables	Gender		P value
	Male	Female	
Immediate reaction after injury?			
Anxiety and stress	77(20.0%)	225(58.4%)	0.055
Anger directed on self	14(3.6%)	33(8.6%)	
Indifferent \didn't care	7(1.8%)	29(7.5%)	

Table 21: Relations between genders of final dental students towards the immediate reaction after injury, Khartoum State.2017.

Relationship between genders and practice of final dental students toward sharp instruments injury:

Variables	Gender		P value
	Male	Female	
Hepatitis B vaccination			
Yes	75(19.5%)	258(67.0%)	0.080
No	23(6.0%)	29(7, 5%)	

Table 22: Relation between genders of final dental students toward who had hepatitis B vaccination, Khartoum State, 2017.

Variables	Gender		P value
	Male	Female	
Uses safety box ?			
Yes	84 (21.8%)	267 (69.4%)	0.112
No	14 (3.6%)	20 (5.2%)	

Table 23: Relation between genders of final dental students towards uses of safety box, Khartoum state, 2017.

Variable	Governmental	Private	P value
Do you have ever contaminated sharp instrument injury?			
Yes	63 (16.4%)	196(50.9%)	0.096
No	20 (5.2%)	106(27.5%)	
Do you know about universal guidelines?			
Yes	58(15.1%)	169(43.6%)	0.022
No	25(6.5%)	133(34.5%)	
Are you aware of the diseased caused by sharp instruments?			
Yes	78(20.3%)	270(70.1%)	0.062
No	5(1.3%)	32(8.3%)	
Did you attend any infection control programmed			
Yes	60(15.6%)	206(53.5%)	0.036
No	23(6%)	96(24.9%)	
Are aware of post exposure prophylaxis?			
yes	74(19.2)	78(58.2%)	0.004
No	224(2.3)	9(20.3%)	
Do you think contaminated sharp instruments transmitted disease?			
Yes	82(21.3)	287(74.5)	0.077
No	1(0.3%)	14(3.9%)	

Table 24: Relationship between knowledge and type of university of final dental students towards sharp instruments injury, Khartoum, State, 2017.

Variables	Type of university		P value
	Governmental	Private	
Hepatitis B virus persists for seven days on medical devices?			
Agree	57(19.4%)	161(41.8)	0.299
Disagree	3(0.08%)	101(10.4%)	
No opinion	5(1.3%)	40(26.2%)	

Table 25: Relationship between types of universityof final dental students towards hepatitis Bvirus persists for seven days on medical devices, Khartoum State, 2017.

Variables	Type of university		P value
	Governments	Private	
Do you think hepatitis B vaccination is mandatory for dental students?			
Yes	81(20.0%)	285(74%)	0.061
No	2(0.05%)	17(4.4)	

Table 26: Relationship between type of universityof final dental students toward thinking if hepatitis B vaccination is mandatory for all dental students, Khartoum state, 2017.

Variables	Type of university		P value
	Governmental	Private	
The main reason for sharp instruments injury?			
Due to work load	37(6.6%)	101(26.2%)	0.096
Lake of experience	14(3.6%)	61(15.8%)	
carelessness	26(6.8%)	116(30.1%)	
Knowledge deficit	6(1.6%)	24(6.2%)	

Table 27: Relationship between type of university of final dental students towards the reason for sharp instruments injury, Khartoum State, 2017.

Variables	Type of university		P value
	Governmental	Private	
More emphasis and training during dental curriculum and education denial program			
Yes	73(19%)	261(67.8%)	0.019
No	10(2.6%)	41(10.6%)	

Table 28: Relation between type of university dental students towards thinking about infection control emphasis during dental curriculum, Khartoum State, 2017.

Variables	Type of university		P value
	Governmental	Private	
Reason for not reporting injury?			
Not knowing how and to whom report	42 (10.9%)	128 (33.2%)	0.038
Self care	13 (3.4%)	100 (26%)	
Injury was minor	13 (3.4%)	31 (8.1%)	
Item was un used	41 (.0%)	14 (3.6%)	
Being busy	11 (2.9%)	29 (7.5%)	

Table 29: Relationship between type of university of final dental students towards reason for not reporting injury, Khartoum State, 2017.

Variables	Type of university		P value
	Governmental	Private	
Immediate reaction after injury?			
Anxiety and stress	63 (16.4%)	239(62.1)	0.034
Anger directed on self	11 (2.9%)	36(9.4%)	
Indifferent \didn't care	9 (2.3%)	27(7.0%)	

Table 30: Relationship between types of university of final dental students towards the immediate reaction after injury, Khartoum State.2017.

Relationship between type of university and practice towards sharp instruments injury

Variables	Type of university		P value
	Governmental	Private	
Hepatitis B vaccination			
Yes	82(21.3%)	251(65.2%)	0.185
No	1(0.03%)	51(13.2%)	

Table 31: Relationship between type of university of final dental students toward who had hepatitis B vaccination, Khartoum State, 2017.

Variables	Type of university		P value
	Governmental	Private	
Uses safety box?			
Yes	81 (21%)	270(70.1%)	0.020
No	2 (0.05%)	32(8.3%)	

Table 32: Relationship between type of university of final dental students towards uses of safety box, Khartoum state, 2017

Discussion

Several studies have reported on occupational injuries among dental students with variable findings.

It was found in this study adequate knowledge of final dental students towards sharp instruments injury (80%) in Khartoum state. About (67.27%) of final dental students in Khartoum state had contaminated sharp instruments Injury like the study in Kudzu in South Africa where (20-80%) **[**40**]**. Were exposed and in India just (35%) had been exposed and in Mahatma (57%) the high percentage in Karachi about (73%) were exposed to sharp instruments injury during practice **[**42**]**.

In Mangalore it was found that (82%) of respondents were aware of blood borne diseases including HIV, hepatitis B and hepatitis C **[**3**]**. And this was lower than the present study (96%).

In this study only (32%) of final dental students knew about universal guidelines and in Chennai in the study of dental students (37%) approximately the same percentage **[**38**]**.

In this study more than half of final dental students (69%) had attended infection control program which had increased their knowledge. Also (88%) of subjects in Saudi Arabia (Jeddah) were attending infection control course **[**24**]**

It was found in this study (74%) were aware about post exposure prophylaxis and in Chennai India (33%) not aware about post exposure prophylaxis **[**38**]**.and in other study in Saudi Arabia (Jeddah) (79%) were aware of the taking post exposure prophylaxis **[**24**]**

In the present study the main cause for sharp instruments injury was due work load and carelessness and in others study lack of experience was the main reason of sharp instruments injury like in Karachi. **[**18**]**.

Majority of participants in current study (44%) were not knowing how and to whom report injures believing that reporting injury would not influence the outcome and similar study in Ajman was found the main reason for not reporting was the the fear from stigmatization and discrimination from consequence of injury.**[**29**]**.

According to attitude of immediate reaction after injury was found in Richer (12%) were washed the site injury with soap and running water and (26%) washed with spirit which is approximately the same result of current study **[**22**]**.

Saudi Arabia, Jeddah found that all students (100%) were vaccinated against hepatitis B virus **[**24**]**.better than the current studies (86%) were vaccinated and only (43%) had completed vaccination

against hepatitis B virus. But in study Mantosclaros was found the higher prevalence of completed vaccination among professional compare with dental students (75%) **[**32**]**.

According to standard percussion in present study most of students wear gloves and mask and most of them used safety box for disposal of sharp instruments but just (23%) uses double hand for recapping which is very poor percentage for preventing the needle stick injury this was lower than the study in south Kerala **[**1**]**.and in Bolin medical college Quetta was found that (73%) wear gloves and just (23%) were recap needle after uses which lower than the present study**[**30**]**.

In this study most of students reported injury during local anesthesia administration It was the main activity that cause injures, different from study in Saudi Arabia reported scaling was the main activity **[**24**]**. And the needle was the main tool for injury .Similar studies in Ajman the main reason for injury was found to be due to needle recapping **[**29**]**. Also other many studies in Mahatma and South Africa finding the same result of the present study **[**42**]**.

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