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RESEARCH ARTICLE

APPRAISAL OF BLOOD BORNE INFECTION AS AN OCCUPATIONAL RISK AMONG DENTISTS IN THE DENTAL HEALTH FACILITIES.

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Abstract

Introduction: Dental practitioners as other healthcare workers deal with a identified risk of occupational exposure to blood-borne pathogens like the Human Immunodeficiency Virus (HIV), the hepatitis B virus (HBV), and the hepatitis C virus (HCV).
Aim: To find out the extent of awareness of dentists in El-Madinah El-Munawarah to the occupational risk of blood borne infection.
Material and Method: A cross-sectional analytic study using a self-administered questionnaire will be distributed to (174) dentists in the various centres and hospitals in El-Madinah El-Munawarah. The questionnaire questions will be related to participants' nationality, age, and gender, where they are working in (private or governmental) and their awareness of blood-borne infection.
Results: The results based on analysis of collected data show dentists have the knowledge about blood-borne disease had a good percentage of knowledge.
About the potential routes of blood-borne infections in the dental setting, more than 70% of dentists have enough knowledge to protect themselves.
Conclusion: Safer work practices and instrumentation and continued worker education, with particular reared to post-treatment handling of sharp dental instruments and equipment, may reduce occupational blood exposure among dentist.

Introduction:-

Dental practitioners as other healthcare workers deal with a identified risk of occupational exposure to blood-borne pathogens like the Human Immunodeficiency Virus (HIV), the hepatitis B virus (HBV), and the hepatitis C virus (HCV).[1]

In dentistry, sharps injuries occur because of a small operating field, frequent patient movement, and the variety of sharp instruments used in dental procedure.[2] The risk of exposure to blood-borne infections during the clinical dental training, consequences of non-reporting, and lack of appropriate follow-up or even infection should constantly be evaluated by dental institutions.[2]

The risk of HIV transmissions to healthcare workers approximately range from 0.2 to 0.3% for parenteral exposures and 0.1% or less for mucosal exposures.[3] A report published by the Centers for Disease control and Prevention

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(CDC) studied the 208 dental exposures (percutaneous, mucous membrane, and prolonged skin exposures) communicated to the CDC from 1995 to 2001, 13% had HIV-positive source patients and did not lead to a seroconversion (75% of exposed individuals took the three-drug PEP regimen for variable lengths of time).[4]

Percutaneous exposure to HBV containing transmission risk about 2% for HBeAg-negative and 30% for HBeAg-positive blood.[2] Despite reducing the risk for HBV transmission among healthcare workers by effective HBV vaccination programs, measuring of anti-HBs antibody response after HBV vaccination is essential for all vaccinated individuals with high-risk professions.[1, 2]

HCV transmission risk is 1.8% and is the most serious viral hepatitis infection because of its ability to produce chronic infection in as many as 85% of those infected.[5, 6] The U.S. Public Health Service recommendations for HCV exposures implicate precise follow-up of the exposed practitioners and referral for appropriate therapy if an infection occurs.[7]

Dentists can acquire BBV infections through exposure to patient blood during procedures. Dentists can transmit BBV infection when patients are exposed to the blood of the dentist; these exposures are more frequent than many dentists appreciate. In 1986, US dentists reported an average of one percutaneous injury per month [8].

In 1991, the main causes of percutaneous injury in dentistry were burs (31%), syringe needles (30%), sharp instruments including laboratory knives (21%), and orthodontic wire (6%) [9].

Fortunately, the frequency of percutaneous injury by dentists appears to have declined to about 0.28 injuries per month, or 3.35 per year [10], likely as a result of Standard Precautions. However, it is probable that many percutaneous injuries are unrecognized since surgeons perceive only 30-66% of glove perforations [11,12].

Patients are exposed to the dentist's or surgeon's blood when the sharp object that caused the injury re-contacts the patient; one study reported that this happened in 32% of sharp object injuries to surgeons [13].

It is clear that there is a very real risk of viral transmission in the dental office. There is evidence of transmission of HBV, HIV, and HCV in the dental clinic and those who are not immune to HBV are particularly at risk. Also, there are clear indications that the frequency of exposures to blood among dentists needs to be reduced to minimize the risk of occupationally acquired blood-borne infections. [13].

Study objectives:-

- To evaluate the extent of awareness of dentists in El-Madinah El-Munawarah to the occupational risk of blood borne infection.

Study design:-

A cross-sectional analytic study using a self-administered questionnaire will be distributed to dentists in the various centres and hospitals in El-Madinah El-Munawarah.

A self-administered anonymous questionnaire WAS designed to assess the knowledge, attitude, and practices of dentists while there are in dental clinics along with corresponding demographic variables. Questionnaire questions were carefully selected from relevant published reports in international journals. The questionnaire questions WERE related to THE participants' nationality, age, and gender, where they are working in (private or governmental) and their awareness of blood-borne infection.

Dentists working in both private and governmental centres in El-Madinah El-Munawarah WERE invited to participate after they have been informed Verbally about the importance of the study. A waiver of documentation form will be requested based on the nature of the survey tool that is a self-administered questionnaire

Sample size:-

The sample was calculated using Raosoft sample size calculator [14]. For an approximately a population size 412 (information was provided by from PABMDC), assuming a response distribution of 50%, Confidence level of 95%, accepted margin of error 5%. The sample size of the study population is 210 subjects.

Patient selection:-
Inclusion criteria:-
Inclusion criteria for sampling will be in all dentists who are currently work in El-Madinah El-Munawarah.

Exclusion criteria:-
Non-dentists.

Ethical clearance form:-
The study protocol described herein will be obtained from the College Research Ethics Committee (REC), and a written informed consent from each patient will be achieved according to the Taibah University Research Ethics Committee (TUREC). The study will conform to the principles outlined in the Declaration of Helsinki.

Statistical Analysis:-
Data entry and analyzes of results will be done using the Statistical Package for Social Sciences (SPSS) ver 21 for Windows software1. Descriptive statistics such as mean and standard deviation (SD) for continuous variables and frequency and percentage for categorical variables will be determined. Inferential statistics will then be followed using parametric and non-parametric test for univariate analysis followed by multivariate analysis using logistic regression. The level of significance was set at $p < 0.05$.

Results:-

Dental practitioners as other healthcare workers deal with a identified risk of occupational exposure to blood-borne pathogens like the Human Immunodeficiency Virus (HIV), the hepatitis B virus (HBV), and the hepatitis C virus (HCV).

In dentistry, sharps injuries occur because of a small operating field, frequent patient movement, and the variety of sharp instruments used in dental procedure. Moreover, to find out the extent of awareness of dentists in El-Madinah El-Munawarah to the occupational risk of blood borne infection.This cross-sectional analytic study is for comparison of knowledge of dentist about blood-borne diseases.

A total of 174 participants from both genders in El-Madinah El-Munawarah particpated in the study

Personnel data:-
The sex distribution of the participants were 51.7% male and 48.3% female (Table1).

The majority of the participants were aged between 31-35 years old (Table2).

Educational status 48.3% of participants had Bachelor degree in dentistry, 35.1% Masters degree and 16.7% Ph.D. degree. (Figure1) .

Half of the Participants they graduate and practicing since 1-5 years (Table 3, 4).

Participants are working in ministry of health about 36%,31.4% in private clinic 28.5% university college 4.1% in other places (Figure2).

Participants had a needle stick or sharps injury within the last year 61.5% (Table5). 67.6% They report the incident (Table5).
If they injured they washed the site with water and soap about 34.8%, 39.1% Washed the site with an antiseptic solution (e.g. Alcohol, etc..), Only squeezed the blood out around 21% and whom did nothing about 5.1% (Table6).

Prevention measures:-
Most of the participants recapped the used needles (Table 5).

The most Technique of recapped was one handed method (Table 7). The most way to disposed off the used needles is In a sharps container (safety boxes) (Table 8).

94.3% of the participants are washing their hands between each patient (Table 5).

During practicing 97.7% they wear gloves, 96.6% are wearing mask, 38.5% they used protective eye and 72.4% wearing gowns, lab coats (Table 9).

Information measures:-
General knowledge of participants about blood borne diseases (HBV, HCV, HIV) (Table 10).

Information about the Potential routes of blood-borne infections in the dental setting. (Table11)

Table 1:- The gender of the Participants.

	Frequency	Percent
Male	90	51.7
Female	84	48.3
Total	174	100

Table 2:- The age of the participants.

	Frequency	Percent
25-30	55	31.6
31-35	70	40.2
36-40	28	16.1
≥ 40	21	12.1
Total	174	100

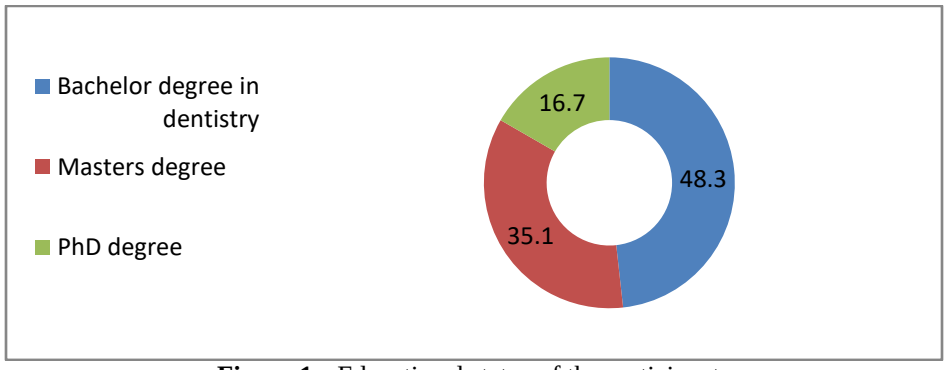

Figure 1:- Educational status of the participants

Table 3:- Years since graduation

	Frequency	Percent
1-5	88	50.6
6-10	38	21.8
11-15	27	15.5
16-20	14	8
≥20	7	4
Total	174	100

Table 4:- Years since practicing.

	Frequency	Percent
1-5	85	48.9
6-10	27	15.5
11-15	30	17.2
16-20	24	13.8

≥20	8	4.6
Total	174	100

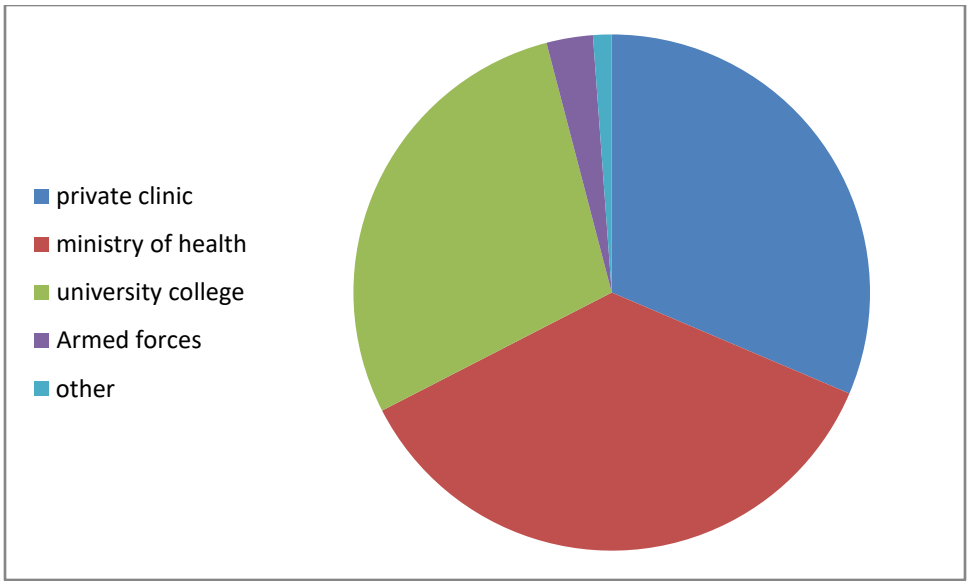

Figure 2:- Side they are belonging to

Table 5:- preventive measure.

	yes		no	
	Frequency	Percent	Frequency	Percent
Needlestick or sharps injury within the last year.	107	61.5	67	38.5
Needlestick or sharps injury, did you report the incident.	48	32.4	100	67.6
Do you recap the used needles?	158	90.8	16	9.2
Do you wash your hand in between each patient?	164	94.3	10	5.7
Total	174	100		

Table 6:- After injured participants did.

	Frequency	Percent
wash the site with water and soap	48	34.8
Wash the site with an antiseptic solution (e.g. Alcohol etc..)	54	39.1
Did nothing	7	5.1
Only squeezed the blood out	29	21
Total	174	100

Table7: The most Technique of recapped used needles

	Frequency	Percent
Only a one-handed method	109	62.6
A two handed method	56	32.2
A special mechanical device to recap used needles	9	5.2
Total	174	100

Table 8:- Used needles disposed in.

	Frequency	Percent
In the normal refused bin	20	11.5
In a sharps container (safety boxes)	154	88.5
Total	174	100

Table 9:- wearing personal protective equipment.

In your practice do you	Always		Sometimes		Do not wear	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Wear gloves?	170	97.7	4	2.3	0	0
Wear a mask?	168	96.6	6	3.4	0	0
Use protective eye glasses?	67	38.5	66	37.9	41	23.6
Wear gowns, lab coats?	126	72.4	23	13.2	25	14.4

Table 11:- Potential routes of blood borne infections

Potential routes of blood-borne infections in the dental setting may include which of the following:	Yes		No		Not sure	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Broken skin in contact with saliva contaminated with blood of HBV-positive patient	141	81	4	2.3	29	16.7
Broken skin in contact with blood of blood-borne infections positive patient.	147	84.5	6	3.4	21	12.1
Broken skin in contact with saliva of blood borne infections positive patient .	114	65.5	34	19.5	26	14.9
Intact skin with blood borne infections positive patient .	45	25.9	103	59.2	26	14.9
Intact skin with intact skin of blood-borne infections positive patient	28	16.1	101	58	45	25.9
Needle stick injury	147	84.5	4	2.3	23	13.2
Aerosol produced by a handpiece.	83	47.7	35	20.1	56	32.2

Table 10:- General knowledge of participants about blood borne diseases (HBV, HCV, HIV)

	Yes		No		Not sure	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Bloodborne infections carrier may look healthy without showing any symptoms of the disease.	138	79.3	6	3.4	30	17.2
Blood borne infections can be lethal	142	81.6	16	9.2	16	9.2
Bloodborne infections can be caused by bacteria	61	35.1	73	42	40	23
Blood borne infections is contagious	121	69.5	30	17.2	23	13.2
Patients can spread the viruses to dentists.	144	82.8	13	7.5	17	9.8
HBV vaccination is not for all people	56	32.2	87	50	31	17.8
Dentists can spread the viruses to their patients	132	75.9	28	16.1	14	8
HBV vaccination does not cause hepatitis	98	56.3	46	26.4	30	17.2
HBV vaccination can prevent hepatitis.	116	66.7	32	18.4	26	14.9
HBV vaccination does not increase the risk for complications.	83	47.7	58	33.3	33	19
HBV vaccination is contraindicated in pregnancy.	60	34.5	47	27	67	38.5
The antibodies for HBV need to be checked after three titers.	94	54	30	17.2	50	28.7
AIDS is caused by HIV	132	75.9	24	13.8	18	10.3
HIV transmitted with sperm.	110	63.2	33	19	31	17.8
HIV transmitted with saliva.	60	34.5	73	42	41	23.6
A positive anti-HIV antibody finding indicates that a patient had contact with the HIV.]	88	50.6	55	31.6	31	17.8

Reddish, bluish and violet nodules and plaques found intraorally represent HIV infection:	83	47.7	48	27.6	43	24.7
Infection with HCV can cause the liver to stop working:	104	59.8	25	14.4	45	25.9
You can get HCV by getting a blood transfusion from an infected donor.	125	71.8	22	12.6	27	15.5
You can get HCV by shaking hands with someone who has hepatitis C	35	20.1	100	57.5	39	22.4

Discussion:-

This cross-sectional study investigated blood-borne infection among dentists working in El-Madinah El-Munawarah. The frequency of respondents (61.5%) had a needle stick or sharps injury within the last year; this is less than that reported in other studies. Khader indicated that 66.5% of dentists in Jordan were injured by needles [14].

The non-reporting of needle stick injuries in this study was 67.6%. This result is also less than that mentioned by Khader, who found that 77.9% of all injuries were un-reported by the Jordanian dentists [14].

In the present study, 90.8% of those surveyed recap needles after use. This figure is higher than a study by Boras conducted in Croatia, which showed that 85% of the examined dentists do the same [15].

In this study, dentists during practice, wore gloves 97.7%, wore a mask 96.6%, and used protective eyewear 38.5%, and 72.4% wore gowns, lab coats. In comparison, with the study of Boras [15], only 50% of the dentists surveyed wore protective gloves, and masks and 43.3% dentists wore protective eyewear. This means that dentists in El-Madinah El-Munawarah are more careful than their Croatian counterparts in wearing personal protective equipment.

A large percentage of the surveyed dentists 75.9%, said yes that HIV causes AIDS, Only 63.2 % of the surveyed dentists know that HIV is transmitted through sperm. A Positive answer to the question that whether HIV is transmitted via saliva was given by 34.5% of examined dentist.

Our results are in concordance with Boras [15]. Who found that 37% of Croatian dentists think that HIV is transmitted through sperm. Moreover, surprisingly, a large percentage of the surveyed Croatian dentists (60%) do not know that HIV causes AIDS. 49% said that HIV is transmitted via saliva.

About the potential routes of blood-borne infections in the dental setting more than 70% of dentists have the knowledge about the possible routes of bloodborne infection transmission; broken skin in contact with saliva contaminated with blood of blood borne infection positive patient, broken skin in contact with blood of blood borne infection positive patient and needle stick injury had the highest percentage of knowledge.

Conclusion:-

1. The general incidence of blood borne disease and reporting attitude among dentists found in this survey are of concern.
2. Safer work practices and instrumentation and continued worker education, with particular reared to post-treatment handling of sharp dental instruments and equipment, may reduce occupational blood exposure among dentist.

Recommendations:-

Health authorities may plan awareness programs and interventions to improve the level of knowledge in those with low level of knowledge about blood-borne disease.

Limitations:-

There are some potential limitations in this study that should be considered when interpreting the results. First, since the study was a cross-sectional descriptive study, therefore, no direct relationship between variables and outcomes can be proved. A second limitation is the potential reporting bias associated with the self-administered questionnaire with the possibility that dentists tend to over-report compliance Also, to get some participants respond was difficult especially dentists are working in private clinics.

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