



# **Knowledge, attitude and practices toward prevention of hepatitis B virus infection among dental students at university of Benghazi**

**By**

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**This thesis was submitted in partial fulfillment of the requirements for master's degree of science in Community and Preventive Dentistry**

**University of Benghazi**

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حقوق الطبع محفوظة 2020 لا يسمح اخذ اي معلومة من اي جزء من هذه الرسالة على هيئة نسخة الكترونية او ميكانيكية بطريقة التصوير او التسجيل او المسح من دون الحصول على إذن كتابي من الباحث أو إدارة الدراسات العليا والتدريب جامعة بنغازي.

University of Benghazi

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## **Dedication**

Dedicated to:

My beloved family for their constant love, support and prayers.

My brother dr. Ala eldine benkia.

My sisters Siham, Fatma and dr. Salwa Benkia for making it all possible and last, but not least, My son ,daughter and husband.

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**Ebtisam Bankia**

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## List of abbreviation or symbols

Abbreviation OR symbols	Meaning
AIDS	Acquired Immune Deficiency Syndrome
anti-HBc	Antibody to hepatitis B core antigen
Anti-HBs	Antibody to hepatitis B surface antigen
CDC	Center for Disease Control
EMRO	Eastern Mediterranean Region Office
ENT	Ear, nose and throat
HAV	Hepatitis A virus
HBcAg	Hepatitis B virus core antigen
HBsAg	Hepatitis B surface antigen
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HCW	health care worker
HDV	Hepatitis D virus
HEV	Hepatitis E virus
HIV	Human immunodeficiency virus
IgG	Immunoglobulin G
IgM	Immunoglobulin M
KAP	knowledge, attitude and practice
km	kilometre
KUDCs	Kuwait university dental clinics
NSI	Needle stick injuries
OH	oral hygiene
PEP	post-exposure prophylaxis
PHC	Primary health care
PHCC	Primary health care center
PPE	personal protective equipment
TUMS	Tehran University of Medical Sciences

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## **Abstract**

**Background:** Hepatitis B poses a major health concern and is the world's most common blood borne viral infection placing dental professionals at higher occupational risk. **Aims and objectives:** To investigate the knowledge, attitudes and practices (KAP) regarding the prevention of hepatitis B virus infection among dental students at university of Benghazi. **Material and Method:** This was a descriptive cross-sectional study conducted among dental students of university of Benghazi registered in academic year of 2018/2019. Data analysis was in the form of frequency and percentage and chi-square test were done. **Results:** The study included 500 dental Students. The response rate was 73.5%, 79% were females. Overall, the participants showed good level of knowledge about HBV-related issues. level of knowledge regarding mode of HBV transmission was found to be fairly acceptable percentage , the subjects showed positive attitude. Also the response of dental students to the use of personal protective equipment was adequate and 93% of the students were vaccinated. **Conclusions:** The students had reasonable knowledge, positive attitude and good practices towards HBV. Areas of insufficient knowledge needed to be reinforced included

some modes of transmission of HBV, and last comprehensive extended sampling of dental students from all the dental collages as well as medical, nursing schools should be recommended in the future not only for HBV but all the infectious diseases especially on the COVID 19.

# **Chapter one**

## **Introduction**

## **Introduction:**

Hepatitis is an inflammation of the liver, Hepatitis viruses are the most common cause of hepatitis in the world but other infections, toxic substances (e.g. alcohol, certain drugs), and autoimmune diseases can also cause hepatitis. There are 5 main hepatitis viruses, referred to as types A, B, C, D, and E. These 5 types are of greatest concern because of the burden of illness and causing death. Also the potential for outbreaks and epidemic spread. In particular, types B and C lead to chronic disease in the majority of people that may together, are the most common cause of liver cirrhosis and cancer<sup>(1)</sup>.

Hepatitis A virus (HAV) is present in the feces of infected persons and is most often transmitted through the consumption of contaminated water or food. Certain sex practices can also spread HAV. Infections are in many cases mild, with most people making a full recovery and becoming immune from further HAV infections. However, HAV infections can also be severe and life-threatening. The people who live in areas with poor sanitation have been infected with this virus. Safe and effective vaccines are available to prevent HAV<sup>(1)</sup>.

Hepatitis B virus (HBV) is transmitted through exposure to infected blood, semen, and other body fluids. HBV can be transmitted from infected mothers to infants at the time of birth or from family members to infants in early childhood<sup>(1)</sup>. Transmission may also occur through blood transfusions of HBV-contaminated blood and blood products, contaminated injections during medical procedures, and through injection drug use. HBV also poses a risk to healthcare workers who sustain accidental needle stick injuries while caring for

infected-HBV patients. Safe and effective vaccines are available to prevent HBV<sup>(1,2)</sup>.

Hepatitis C virus (HCV) is mostly transmitted through exposure to infective blood. This may happen through transfusions of HCV-contaminated blood and blood products, contaminated injections during medical procedures, and through injection drug use. Sexual transmission is also possible but is much less common. There is no vaccine for HCV<sup>(1)</sup>.

Hepatitis D virus (HDV) infections occur only in those who are infected with HBV. The dual infection of HDV and HBV can result in more serious disease and worse outcome. Hepatitis B vaccines protect from HDV infection<sup>(1)</sup>. Hepatitis E virus (HEV) is mostly transmitted through the consumption of contaminated water or food. HEV is a common cause of hepatitis outbreaks in developing parts of the world and is increasingly recognized as an important cause of disease in developed countries. Safe and effective vaccines to prevent HEV infection have been developed but are not widely available<sup>(1)</sup>.

Hepatitis B is a potentially life-threatening liver infection caused by the hepatitis B virus (HBV)<sup>(2)</sup>. It is a major global health problem despite the availability of effective vaccines for several decades and a leading cause of mortality and morbidity, particularly in developing countries. The main public health problem is that it can lead to lifelong chronic HBV infection, which may be followed by cirrhosis and/or liver cancer<sup>(2)</sup>. It is the tenth leading cause of mortality worldwide<sup>(3)</sup>. According to the World Health Organization (WHO), over two billion people are infected by HBV, more than 200 million



people were chronic carriers of HBV and more than 800 000 deaths annually as a result of the consequences of hepatitis B <sup>(2,4)</sup>.

The endemicity of HBV infection varies greatly over the world, from highly endemic areas (more than 8% infection rate) to intermediate (2-8%) and low endemicity areas (less than 2%) <sup>(4)</sup>. Libya has an area of more than one and a half million km and a population reported in mid-2006 as 5,323,991, giving a population density of 2.9 persons per km <sup>(4)</sup>. In Libya, the carrier state of the disease among the general population was found at 2.2%, which is considered an area of low-intermediate endemicity <sup>(5)</sup>.

HBV is highly contagious and between 50 and 100 times more infectious than (HIV) <sup>(6)</sup>. Furthermore, after cigarette smoking, HBV ranks second on the list of known carcinogenic agents that affect humans. The consequence of acute infection of HBV can cause non-specific symptoms or develop acute hepatic failure or require emergency liver transplantation, chronic infection can progress to liver failure, cirrhosis, or hepatocellular carcinoma <sup>(7)</sup>.

HBV is contagious and easily be transmitted from one infected individual to another. The main transmission routes include postnatal infection, skin and mucous membrane infections caused by contaminated blood or body fluids, sexual contacts, and injection drug abuser <sup>(8,9)</sup>. Besides, tattooing, ear piercing, acupuncture, dialysis and even using a contaminated syringe can be the source of infection <sup>(8)</sup>. HBV cannot be transmitted by holding hands, sharing food, kissing, hugging, coughing, sneezing, or breastfeeding <sup>(7)</sup>. In addition to its routes of transmission, this virus remains infectious outside the body for more than one week on environmental surfaces and transmissible

in the absence of visible blood<sup>(2)</sup>. The incubation period of the HBV is 75 days on average but can vary from 30 to 180 days, the virus may be detected within 30 to 60 days after the acquisition and can persist and develop into chronic hepatitis B<sup>(2)</sup>.

Infection with HBV may result in acute or chronic disease, both of which can be asymptomatic, which means that contagious people; are at risk without knowing it, unaware of their risks for transmitting the virus to others and for having serious liver disease later in life<sup>(11)</sup>. However, many people may experience symptoms such as jaundice, fatigue, loss of appetite, nausea, and abdominal pain<sup>(12)</sup>. In nearly all adults, 90% of infections subside and they become healthy<sup>(12)</sup>.

In the dental office, infections can be expedited through several routes, including direct contact with blood, oral fluids, or other secretions; indirect contact with contaminated instruments, operatory equipment, or contact with airborne contaminants present in either droplet splatter or aerosols of oral and respiratory fluids<sup>(13,14)</sup>. It has been known that HBV infection is the most serious infectious occupational hazard in the dental office<sup>(13)</sup>. It assumes that the provision of dental care carries a risk to both dental care workers and patients<sup>(15)</sup>. Whereas, dentists are more prone to occupational exposure because of close contact with the patients' oral cavity fluids and blood, using sharp instruments and operating with high-speed rotary instruments, which produce infectious aerosols, the occupational risk of HBV among the trainees could be higher due to their lack of experience and insufficient training<sup>(16,17)</sup>.

HBV infection can be prevented by adherence to "standard precautions" which is defined by the Center for Disease Control

(CDC) as a set of precautions designed to prevent transmission of HIV, HBV, and other blood-borne pathogens when providing health care including the use of protective barriers like gloves and masks, routine hand hygiene, proper sterilization of medical equipment, proper hospital wastes management system and vaccination<sup>(7,17,18)</sup>. Under these precautions, blood and certain body fluids of all patients are considered potentially infectious for HIV, HBV, and other blood-borne pathogens<sup>(8)</sup>.

Much has been learned about the hepatitis B virus (HBV) since its original discovery in 1965, leading to the availability of hepatitis B vaccine since 1982, which has generally been described as safe and of 90 - 95% efficiency<sup>(20,21)</sup>. In Libya, a free mandatory vaccination program has been introduced in the 1990s to all newborns as well as too high-risk groups<sup>(5)</sup>. The vaccine is typically given in a three-dose series with a month interval between the first and second dose and six months between the first and the third dose, to stimulate the production of the anti-HBs antibodies. A test for hepatitis B surface antibody can be carried out 6 -8 weeks after the final dose of the primary course of vaccination to ascertain the sustain enough antibody titer<sup>(21,22)</sup>. It is not known if the HBV vaccine gives lifelong protection against HBV and if boosters are necessary<sup>(23)</sup>. However, it becomes known now that the protection can be long lasting for at least 10-15 years if the vaccination is followed correctly<sup>(23)</sup>.

Avoiding exposures is very important for preventing transmission of pathogens, post-exposure prophylaxis (PEP) is also an essential element of programs to prevent infection and is important for health care worker's ( HCWs') safety<sup>(16)</sup>. PEP procedures include immediate

washing of the exposed area; determination of risk associated with exposure, evaluation of the source patient for HBV, taking hepatitis B vaccine and immunoglobulin consumption of antiretroviral drugs, evaluation and follow up of the exposed HCWs'. Each of these procedures is indicated under a certain circumstance and several studies have shown their efficacy<sup>(16,17)</sup>.

Knowledge, attitude, and practice act as three pillars, which make up the dynamic system of life itself<sup>(24)</sup>. Knowledge is some of the information that is acquired or gained, while attitude accredits to thinking towards the proper situation, and practice means contemplation of rules and knowledge<sup>(24)</sup>. Prevention against any disease is proportional to Knowledge, Attitude, and Practice (KAP)<sup>(8)</sup>. As there is a significant possibility of HBV transmission in dental settings<sup>(11)</sup>. Hence, a thorough knowledge of the risks of HBV infection, the probable routes of its transmission during dental treatment, and the most effective preventive strategies against it may be of great help in preventing the spread of this infection<sup>(11)</sup>. The awareness of dental students about the measures that can prevent the transmission of HBV is of great importance. They must start their clinical practice immunized with the vaccine<sup>(22)</sup>.

As dental students become more involved in patient contact during their training, they are at risk of exposure to pathogens. It is the responsibility of academic institutions to facilitate appropriate preclinical immunization and provide training in infection control to protect patients as well as the health of undergraduates, and to lay the foundation for safer work practices in health care<sup>(10,25)</sup>.

Many studies worldwide were published on the knowledge, attitude, and practice of oral health students on HBV infection have found the unsatisfactory response and emphasized the need for further improvement of this kind of knowledge and practice<sup>(21,6,7,9)</sup>. Currently, up to our knowledge, no similar studies have been done in Benghazi-Libya on dental students and the results will assist in the curriculum development and teaching of these students safe practice for their axillaries as well as the health of the general populations.

# **Chapter two**

## **Aim of the study**

### **Aim of the study:**

To investigate the knowledge, attitudes, and practices (KAP) regarding the prevention of hepatitis B virus infection among dental students of the University of Benghazi.

### **Study objectives:**

1. To assess knowledge of dental students at the University of Benghazi regarding prevention of HBV infection.
2. To investigate the attitude of dental students at the University of Benghazi regarding prevention of HBV infection.
3. To investigate the practices of dental students at the University of Benghazi regarding the prevention of HBV infection.
4. To assess the vaccination status of dental students at the University of Benghazi.

# **Chapter three**

## **Review of literatures**



## **Review of literature:**

Hepatitis is a general term meaning “inflammation of the liver” and the most common cause is the infection with 1 of the 5 viruses called Hepatitis A, B, C, D, and E virus. Of the 5 viral causes, HBV is the major cause of acute and chronic hepatitis worldwide<sup>(26)</sup>. Today, viral hepatitis has become a silent epidemic worldwide and it is a very important public health problem<sup>(8,13)</sup>. Unfortunately, HCWs are at high risk of developing hepatitis infection, and vaccination against hepatitis B of all healthcare workers who are being in a contact with blood is highly recommended<sup>(2,27)</sup>. The rates of transmission of HBV to HCWs are influenced by the prevalence of HBV infection in the general population<sup>(28)</sup>. A recent literature review shows that along with other various factors, dental treatment can be a risk factor for Hepatitis B infections<sup>(29,30,31)</sup>.

To prevent blood transmission of infection, it is recommended that health care professionals receive immunization against the disease and use PPE Vaccination represents the main instrument to prevent HBV infection<sup>(22)</sup>. The awareness of dental students about the measures that can prevent the transmission of HBV is of great importance, they must start their clinical practice immunized with the vaccine<sup>(22)</sup>. Prevention is the only safeguard against the epidemic of viral hepatitis. Knowing facts and having proper attitudes and behaviors are critical to prevent the spread of these infections<sup>(32)</sup>.

### **3.1 Structure and molecular virology of hepatitis B virus.**

Hepatitis B virus is a DNA virus, belongs to a family of viruses known as Hepadnaviridae. The virus is primarily found in the liver but

is also present in the blood and certain body fluids<sup>(33)</sup>. Hepatitis B virus consists of a core particle (central portion) and a surrounding envelope (outer coat), the core is made up of DNA, a core antigen (HBcAg), and the envelope contains a surface antigen (HBsAg)<sup>(34)</sup>. These antigens are present in the blood and are used as markers in the diagnosis and evaluation of patients with suspected viral hepatitis<sup>(33,34)</sup>. ( Figure 1) and (table 1).

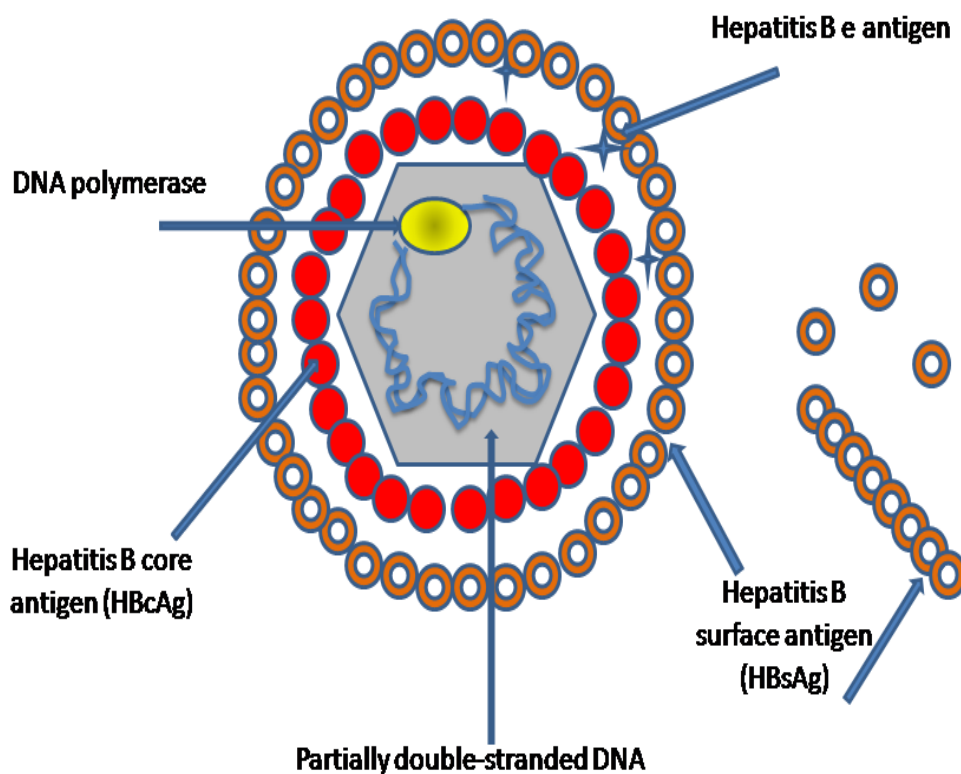


Figure 1: The Virus Particle (Wikipedia)

Table 1: Serological markers and clinical significance (Kotzee et al, 2006)

<b>Serological marker</b>	<b>Clinical significance</b>
Hepatitis B surface antigen (HBsAg) positive	Acute or chronic infection
Antibody to hepatitis B core antigen(anti-HBc) immunoglobulin M (IgM) positive, anti- HBc IgG negative	Acute infection
Anti-HBc IgG and HBsAg positive	Chronic infection
Anti-HBc IgG and antibody to hepatitis B surface antigen (anti-HBs) positive	Resolved infection
Anti-HBc only positive	Exposure; low-level carrier; senescence of anti-HBs; false positive; possible occult HBV infection
Anti-HBs only positive	immunity (vaccinated, or natural infection with waning anti-HBc)

### 3.2 Transmission routes:

The virus is transmitted differently between geographic regions and countries depending on how endemic the HBV is there<sup>(36)</sup>. In regions where the endemicity is low, it is more common that the virus is transmitted through horizontal routes such as injecting drug use, high-risk sexual behavior, and receiving blood products. When in regions with high endemicity, HBV is primarily spread by vertical transmission early in childhood or parentally, from mother to child at birth<sup>(37)</sup>. However, the transmission of HBV infection in Libya appears to be a mixture of prenatal and horizontal transmission<sup>(20)</sup>.

Occupational exposure occurs through percutaneous injuries such as needle sticks or cuts with sharps, contact with the mucus membrane of the eyes or mouth of an infected person, contact with non-intact skin exposed with blood or other potentially infectious body fluids<sup>(37)</sup>. The risk of non-percutaneous exposure has not been well quantified, but it may account for a significant proportion of HBV transmission in the healthcare setting<sup>(38)</sup>.

HBV can survive in dried blood for up to a week and thus may be transmitted via discarded needles or fomites, even days after initial contamination<sup>(39)</sup>. Blood and serous fluid are known to contain the highest viral concentrations<sup>(39)</sup>. Although virus DNA has been detected in other body fluids, such as saliva, nasopharyngeal secretions, semen, or vaginal fluid<sup>(39)</sup>, it seems that HBV does not spread by contaminated food or water, and cannot spread casually in the workplace<sup>(40)</sup>.

### 3.3 Prevalence of HBV

HBV infection is a serious global public health problem. It occurs all over the world (Figure 2). Although the prevalence of HBV carriers varies between countries in the same continent, it can be broadly classified into regions of high, intermediate, and low endemicity<sup>(42)</sup>. Overall, approximately 45% of the global populations live in areas of high chronic HBV prevalence and about 43% in intermediate HBV prevalence, the rest (12%) being those living in areas of the low prevalence of the virus<sup>(43)</sup>. More than 75% of HBV infections occur in Asia and Africa. In high endemic areas, like central Asian republics, Southeast Asia, Sub-Saharan Africa, and the Amazon basin, the HBV carrier rate is over 8%<sup>(43)</sup>. In low endemic regions, like the United States, Northern Europe, Australia, and parts of South America, HBsAg prevalence is less than 2%. The Middle East, some Eastern European countries, and the Mediterranean basin are considered areas of intermediate endemicity with a carrier rate between 2% and 8%<sup>(43)</sup>.

Libya, a developing country belongs to the intermediate endemicity countries. Previous studies of blood donors from serum screening in Libya revealed prevalence rates of HBV are varying between 1.9%–5.8%. The prevalence varied from one region to another (Figure 3). The rate was highest in Sirt (6.6%) and Tarhuna (3.4%), and lowest in Aljabel Alakhdar (1.0%), Benghazi (1.0%), and Arabia (1.4%). The substantial regional variation in the prevalence rate in Libya is probably related to different factors, including socioeconomic conditions, but one particular observation is noteworthy. In Libya, the prevalence of HBV was low in children < 10 years of age (0.8%) due to the compulsory childhood vaccination program<sup>(4)</sup>.

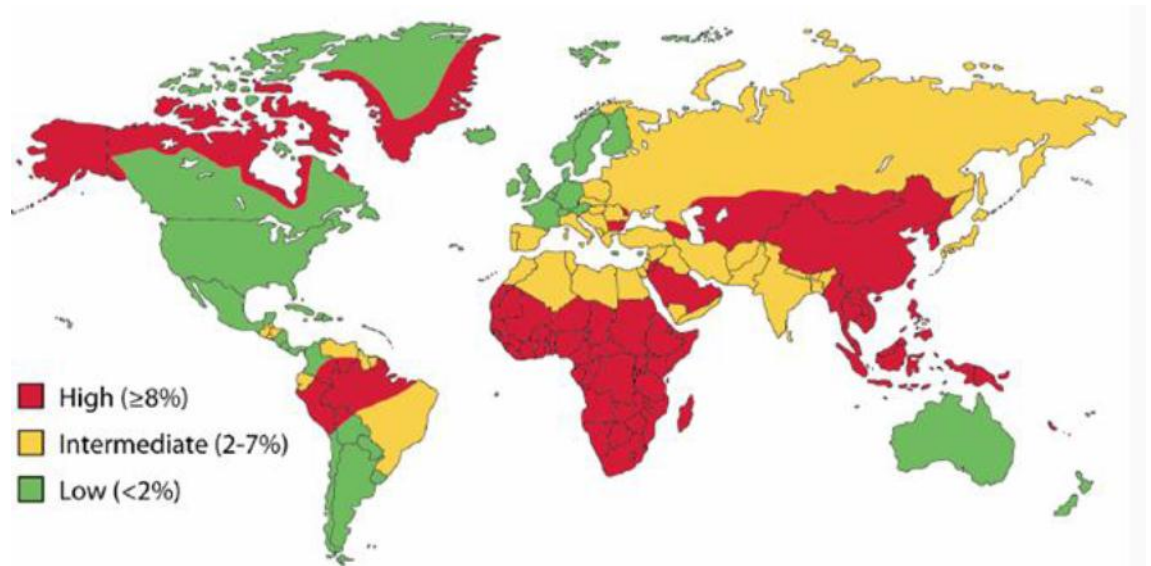


Figure 2: Worldwide prevalence of HBV (Sheridan D,2014)

A review of studies done by Beltrami et al<sup>(44)</sup> in 2000 at the USA had shown high prevalence rates of HBV ranging from 13 to 18% in some groups of HCWs such as general surgeons, an even higher rate, about 27% have been reported among dentists and oral surgeons<sup>(44)</sup>. While in 2014, a study done by Elzouk et al<sup>(27)</sup>, to determine the frequency of hepatitis B and C transmission to HCWs in five major hospitals in eastern Libya, found that the overall frequency of HBs Ag positivity was 1.8%. This low prevalence in that study might be explained by the good awareness of the routes of HBV transmission, the implementation of infection control measures, and the implementation of the free vaccination program to all HCW<sup>(27)</sup>. In 2019, another review of studies done by Babanejad et al<sup>(28)</sup>, found that the prevalence of HBsAg in HCWs in Eastern Mediterranean Region Office (EMRO) and Middle Eastern countries are (2.77%) between

2000 and 2016 was at a moderate level <sup>(28)</sup>. Another study conducted in Sudan done by Elmukashfi T <sup>(45)</sup>, in 2016 found that the prevalence of HBsAg in HCWs was reported 16% <sup>(45)</sup>. While in Moroccan HCWs a lower (1%) prevalence of HBsAg in a study done by K. Djeriri <sup>(46)</sup> in 2008.

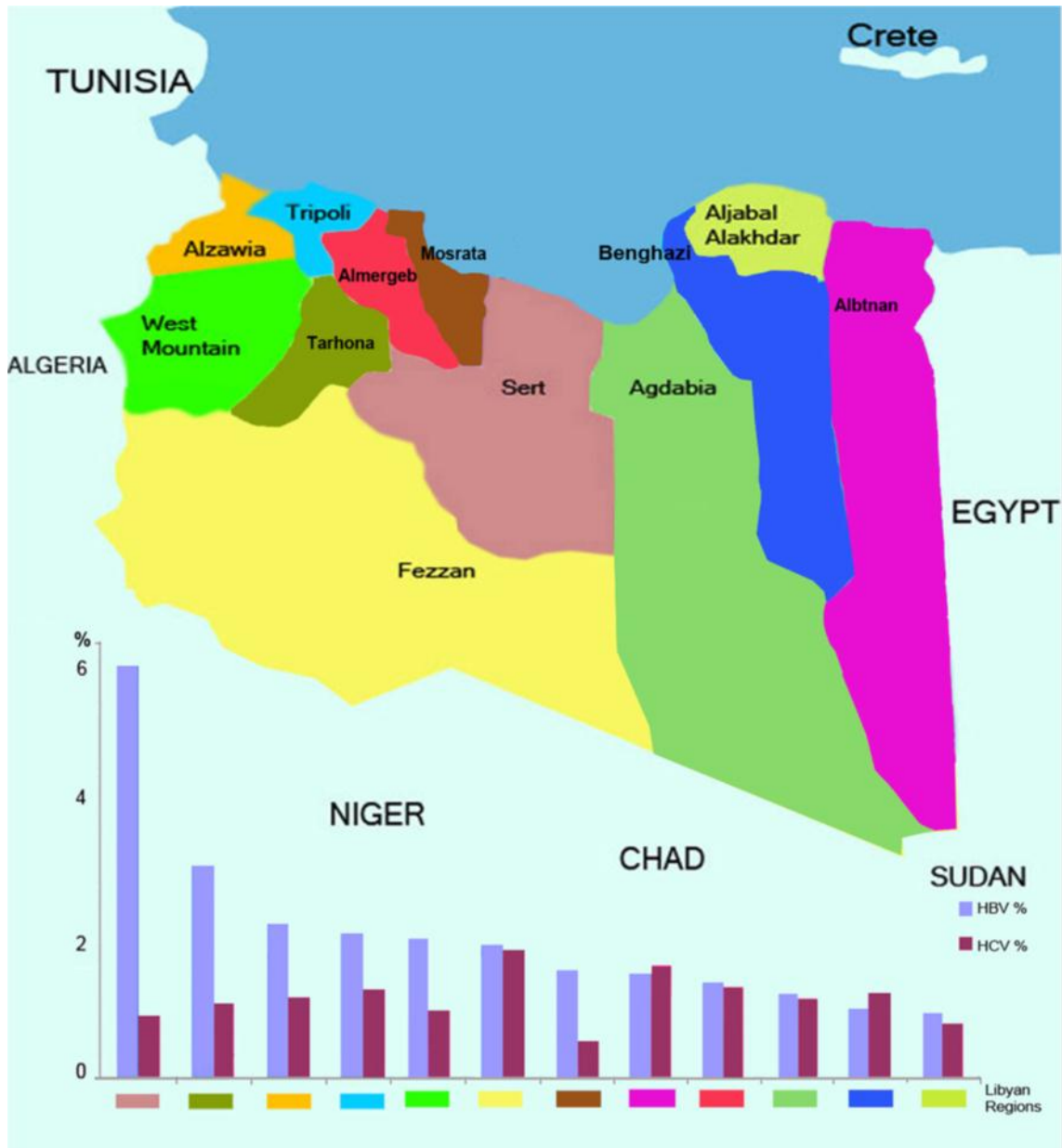


Figure 3: Map of Libya showing the prevalence of hepatitis B infections by region ( Daw and El-Bouzedi, 2014)

### **3.4 Studies On The knowledge, attitude, and practice (KAP) Of health care workers (HCWs) Regarding The Prevention Of HBV Infection:**

Generally, it is easy to assume that health care workers should have adequate knowledge about diseases and other health conditions, under their training and proximity to health facilities<sup>(47)</sup>. Assessing people's knowledge is a useful step to assess the extent to which an individual or community is in a position to adopt a disease-free behavior for this disease<sup>(48)</sup>. Knowledge regarding HBV and safety precautions is needed to minimize the health care settings acquired infections among health personnel. Health care personnel should have complete knowledge of HBV infections, the importance of vaccinations are the practice of simple hygienic measures apart from that of specific protective measures<sup>(48)</sup>. Knowledge and attitudes of the clinician play a key role in the prevention of the spread of infection<sup>(49)</sup>. Unfortunately, researchers have not shown enough interest in evaluating the knowledge of Health-care Workers on hepatitis B virus infection or the vaccine. Most previous studies in health care workers in developing countries have revealed inadequate knowledge of hepatitis B virus infection and inadequate practice of preventive measures against the disease<sup>(47)</sup>.

According to a study done by Kesieme et al<sup>(50)</sup>, in 2011 for operating room personnel in Nigeria, assessing their Knowledge of HB vaccine out of a total of 228 operating room personnel participated in the study, only sixty-one (26.8%) of them had been vaccinated<sup>(50)</sup>. The majority of them had good knowledge about the risk factors for HBV infection<sup>(50)</sup>. Some believed that HBV infection



Can be transmitted through percutaneous injury, mucous membrane contact with blood, and contact of abraded skin with potentially infected tissue<sup>(50)</sup>. It was found that many of the staff were unvaccinated due to lack of time to attend to vaccination and lack of enough information about the HB vaccine<sup>(50)</sup>.

A survey conducted in Kuwait by Habiba et al<sup>(51)</sup>, in 2012, to study HCWs' knowledge, attitudes, and behavior toward hepatitis B virus transmission and protection revealed that knowledge of the various aspects of HBV was generally high. Their attitude towards HBV infections was encouraging since a high percentage of respondents reported positive beliefs toward various attitude questions<sup>(51)</sup>. Particularly, 80.5% indicated that their job puts them at risk of HBV infection, 87.1% reported their need to be protected from HBV infection, and 86.3% considered it necessary to receive the vaccine<sup>(51)</sup>. About three-quarters of the respondents (74.7%) have received the HB vaccine<sup>(51)</sup>. Among them, 84% completed the vaccination doses<sup>(51)</sup>. Amongst those who have never received any dose of vaccine, 79.3% had a nonspecific reason for not receiving the vaccine<sup>(51)</sup>.

In a study by Bakery et al<sup>(52)</sup>, in 2012 which was carried out in four public hospitals in Wad Medani, Sudan, to assess health care providers' knowledge, attitude, and practice towards (HBV) infection, a good respondents' knowledge about HBV transmission was observed. More than 50% of HCWs were not vaccinated. Healthcare workers had poor knowledge about Universal Standard Precautions Guidelines, and do not fully appreciate their occupational risk regarding hepatitis B infection<sup>(52)</sup>.

Another study was performed by Homoud et al<sup>(53)</sup>, in 2013, among PHC physicians practicing in primary healthcare centers (PHCCs) in the Al Jouf province of Saudi Arabia, the majority of physicians surveyed, (82.5%), felt at high risk of contracting and spreading HBV. The vast majority,( 95.6%), considered the HBV vaccine safe for all ages. Of the total, (84.2%) were vaccinated, (36.7%) physicians recognized that HBV is resistant to alcohol, and some detergents<sup>(53)</sup>.

A hospital-based study carried out by Elsheikh et al<sup>(54)</sup>, in White Nile State, Sudan, in 2013, to determine the knowledge, attitude, and practice of health care workers regarding transmission and prevention of hepatitis B virus infection showed that health workers who had an educational level of secondary certificate, university degree and above were significantly had adequate knowledge about HBV<sup>(54)</sup>. Laboratory technicians and laborers have poor knowledge compared to doctors, pharmacists, nurses, midwives, and theater operators<sup>(54)</sup>. More than 80% of health care workers were aware of the availability of protective measures in hospitals<sup>(51)</sup>. They were significantly practicing sterilizing instruments, wearing gloves, and screened the donated blood<sup>(54)</sup>. The attitude of health care workers after suspicious of being infected had shown that 220 do nothing, 99 consider cautery and 57 believe in voluntary testing<sup>(54)</sup>.

A survey was carried out by Bello<sup>(55)</sup> in 2016 on ENT health professionals in a hospital Northern part of Nigeria<sup>(55)</sup>. Results of this study showed that, on average, doctors answered correctly 91.5% of the knowledge questions regarding HB infection followed by laboratory scientists 81.5%, nurses 74.6%, pharmacists 69.5%, and attendants 67.3%<sup>(55)</sup>. The majority of the HCWs felt they need to be protected from HB infection, attendants had the highest score for

good practice than the other health professionals while the lowest score was among the pharmacists<sup>(55)</sup>.

### **3.5 Studies on the knowledge, attitude, and practice (KAP) Of dental professional regarding the prevention of HBV infection:**

A study conducted by Khosravanifard et al<sup>(56)</sup>, in 2009, in Tehran, Islamic Republic of Iran to assess Tehran dentists' knowledge, attitude, and behavior regarding HBV, the study showed that 83.7% of the 300 participants were graded as having poor knowledge 16.3%, had moderate knowledge and non had good knowledge about HBV<sup>(56)</sup>. 43.3% of participants had negative attitudes, 55% had average attitudes and 1.7% had positive attitudes towards HBV<sup>(56)</sup>.

A study done by Yuzbasioglu et al<sup>(57)</sup>, in 2009, in Turkey found that the majority of dentists had moderate knowledge on proper infection control requirements, however, concluded that dentists still need continuous educational programs on infection control<sup>(57)</sup>. As much as 74.10% of dentists expressed concern about the risk of cross-infection from the patients to themselves and their dental assistants<sup>(57)</sup>. Forty-three percent of the participants were able to define “cross-infection” correctly The dentists were asked about universal precautions and their behaviors<sup>(57)</sup>. The greatest majority of the 95.60% stated that all patients have to be accepted as being infectious and universal precautions must apply to all of them<sup>(57)</sup>.

A survey was conducted by Reddy et al<sup>(28)</sup>, in 2011, in India to obtain comprehensive information about the knowledge, attitude, and practices towards hepatitis B infection by dental health care professionals, and their effort to prevent the transmission among the

patients<sup>(28)</sup>. This study showed that dental professionals had good knowledge and attitude regarding hepatitis B and its transmission, but that the infection control measures among the health care professionals are moderately poor<sup>(28)</sup>.

A study was conducted on private dental practitioners, and public sector dental surgeons working in hospitals of Lahore, by Batool et al<sup>(58)</sup>, in 2012, Pakistan, the study revealed that the majority had good knowledge about these viruses, their spread, and prevention but the information was either lacking or was wrong in many dentists<sup>(58)</sup>. Vaccine for hepatitis B was not known in 7%, Attitude evaluation highlighted that 98% of dentists screened their patients for hepatitis-B and C before dental treatment and 80% gave virus-positive patients the last appointment to prevent disease transmission<sup>(58)</sup>. Almost 52% agreed that virus-infected health professionals should not be discouraged from treating patients<sup>(58)</sup>.

A study done by Kadesh et al<sup>(59)</sup>, in Zahedan, in 2013 was conducted to know the knowledge, attitude, and performance of the dentists toward infectious diseases of HIV, hepatitis B, and C, found that 65% of dentists participating in this study had good knowledge, 64% of the dentists had a poor attitude, and optimal performance of 95% the dentists<sup>(59)</sup>.

A survey was conducted by Abdal et al<sup>(60)</sup>, in 2013, on 184 dentists working in primary health care, dental centers, and KUDCs from all governorates of Kuwait<sup>(60)</sup>. Knowledge about hepatitis B virus, vaccine, and routes of transmission of HBV was relatively high<sup>(60)</sup>. Within 184 participants, all were aware that the hepatitis B virus can be acquired from patient to dentists, 86.9% knew that HBV can be

transmitted from dentists to patients. 88.8% know potential transmission of the virus through needle stick injury<sup>(60)</sup>. Most of the respondents have a positive attitude toward HBV vaccination<sup>(60)</sup>. Furthermore, 96.6% were vaccinated against hepatitis B and almost all participants apply preventive measures at work<sup>(60)</sup>.

A study was conducted by Shitoo et al<sup>(61)</sup>, in 2016, among dental professionals in Central India to assess the knowledge, attitude, and awareness with regards to hepatitis B in dental health care professionals, and to estimate the efforts made by them to prevent the transmission of hepatitis among patients<sup>(61)</sup>. This study also evaluated the immunization status of hepatitis B among dentists<sup>(61)</sup>. Out of 450 distributed questionnaires, 424 dentists responded to the questionnaire<sup>(61)</sup>. Among them, 24.05% had not received even a single dose of Hepatitis B vaccine while 50.48% had not completed the required course of vaccination<sup>(61)</sup>. The most common reason cited by dentists for non-immunization was that they had not thought about it (66.03%)<sup>(61)</sup>. Ninety-six percent of the participants were aware of the Hepatitis-B vaccination program<sup>(61)</sup>.

A study-KAP Survey was set out by Baba et al<sup>(62)</sup>, to assess knowledge, attitude, and practices regarding Hepatitis B and C among dental surgeons and to compare the Knowledge, attitudes, and practices among house officers of the two different public Sector Medical/Dental colleges in 2017, in Pakistan<sup>(62)</sup>. The study revealed that the subjects had a good level of knowledge regarding disease transmission, prevention, and treatment, which was from 85-90%, generally positive attitudes toward patient care was 67.9% and 59.5% consider doctors at risk of infection. Overall 53% consider media as the most convenient source of information<sup>(62)</sup>. Needle prick was high

as 48.3%. 91.7% of candidates were vaccinated and some of them attained few lectures regarding hepatitis<sup>(62)</sup>.

Another study was conducted by Ranjan et al<sup>(63)</sup>, among dentists practicing in Bhubaneswar, Odisha, India, in 2018, to assess the knowledge, attitude, and practice of the dentists toward HIV- and HBV-infected patients<sup>(63)</sup>. There was a lack of knowledge among dental practitioners on the modes of transmission of HIV and HBV disease<sup>(63)</sup>. Almost 80% of the dental practitioners had existing fear and concern of the infection transmission from HIV and HBV patients, and this was the primary cause of refusal to treat these infected patients<sup>(63)</sup>. The study showed a considerable number of dentists practicing the use of gloves and regularly changing them along with washing hands before and after patient handling<sup>(63)</sup>.

In another cross-sectional study done by Rostamzadeh et al<sup>(64)</sup>, in 2018, in Sanandaj, Iran. The study was conducted on the dentists' KAP regarding principles of infection control for HBV, HCV, and HIV/AIDS<sup>(64)</sup>. The results indicated that the majority of the subjects showed a relatively high level of knowledge on the HBV, HCV, and HIV/AIDS transmission and treatment method, most dentists reported positive attitudes toward HBV, and the dentists' practice in terms of protective coatings showed more personal protective equipment<sup>(64)</sup>. The results also indicated that dentists' higher level of knowledge about HBV, HCV, and HIV/AIDS was significantly influenced by work experience<sup>(64)</sup>.

Also, a cross-sectional descriptive study was done by Yadav et al<sup>(65)</sup>, in 2019, in Rajasthan<sup>(65)</sup>. The result indicates that Most of the dentist showed good knowledge of different methods of spreading

HBV, HCV, and HIV/AIDS and their treatment modality, the majority of subjects inclined positive attitudes towards HBV, HCV, and HIV/AIDS, and the dentists have a moderate practice regarding HBV, HCV and HIV/AIDS infections<sup>(65)</sup>. It was observed that knowledge regarding HBV, HCV, and HIV/AIDS AIDS was statistically significant with work experience, year of graduation<sup>(65)</sup>. The attitude of study subjects for HBV, HCV, and HIV/AIDS was significantly inclined by age group, work experience, and place of work<sup>(65)</sup>.

### **3.6 Studies on the knowledge, attitude, and practice (KAP) of a dental student regarding the prevention of HBV infection:**

After graduation, dental students, become the future dental healthcare providers, there is an urgent need to make them aware of the risk of spreading and catching contagions, such as HBV, during the interaction with their patients. Dentists, dental students, and their paramedical staff are at a heightened risk of exposure to HBV primarily because dentistry involves extensive and intensive use of small, sharp instruments that can easily get contaminated with infected blood, during an invasive procedure, which is the main mode of transmission of HBV, so dental education can play an important role in the training of dentists, helping them to adopt adequate knowledge and attitudes related to infection control measures<sup>(66,67)</sup>.

a cross-sectional survey study was performed by Alavian et al<sup>(11)</sup>, in 2011 to evaluate dental students' awareness and practice regarding HBV-related issues and to compare the results obtained from different academic years at Tehran University of Medical Sciences (TUMS), in Iran, the study showed that Iranian dental students have a fairly acceptable level of knowledge about HBV-related issues, However,

students' answers to practice questions were less satisfying<sup>(11)</sup>. It is noteworthy that in some cases students of higher academic years showed less awareness, regarding infection control practice, five respondents (3.5%; one in the third and two each in the fifth and sixth years) reported receiving only one dose of vaccination. Twenty-two students (15.5%; three in the third, five each in the fourth and fifth, and nine in the sixth years) had received two doses of HBV vaccine<sup>(11)</sup>. One hundred and fifteen students (thirty-three in the third, thirty-two in the fourth, twenty-eight in the fifth, and twenty-two in the sixth years) had received all three required doses of vaccination<sup>(11)</sup>. Regarding personal protective measures, all students in this study reported that they wore gloves always or usually<sup>(11)</sup>. Indeed, gloves and oronasal masks were said to be used more frequently than eyewear and gowns<sup>(11)</sup>.

A cross-sectional survey was conducted by Brailo et al<sup>(68)</sup>, in 2011, at the School of Dental Medicine, the University of Zagreb, Croatia to assess a group of dental students' knowledge about HIV, HBV, and HCV infections; assess their attitudes and risk perceptions about the treatment of patients with HIV, HBV, and HCV; and identify factors associated with their knowledge and willingness to treat these patients<sup>(68)</sup>. The study showed that Students' knowledge increased with each year of study<sup>(68)</sup>. Senior students (in their third, fourth, and fifth years) had more professional attitudes and were significantly more positive about dentists' professional obligation to treat patients who are HB-positive than were junior students (in their first and second years)<sup>(68)</sup>. Students also expressed significantly more willingness to treat intravenous drug users and patients with hepatitis<sup>(68)</sup>.



A survey was done by Todorova et al<sup>(69)</sup>, in 2015 at Dental Medicine, the Medical University of Varna to investigate the level of knowledge about hepatitis B and C infections and the attitude towards hepatitis B virus vaccination among Dental Medicine students<sup>(69)</sup>. Most of the participants (82.3 %) considered hepatitis B and C as serious diseases and had a positive attitude towards HBV vaccination (75 %)<sup>(69)</sup>. Almost 90 % considered that dental practice could enhance the risk of infection with HBV and HCV<sup>(69)</sup>. Unfortunately, only 57.4 % of students knew their vaccination status<sup>(69)</sup>.

A self-administered questionnaire survey was conducted by Xinyi Li et al<sup>(70)</sup>, in 2015, to assess Chinese dental and medical interns' knowledge, attitude, and behavior (KAB) towards Hepatitis B Virus (HBV) infection and to evaluate which exact KAB phase respondents were involved in<sup>(70)</sup>. This study showed that most medical interns had good or fair HBV knowledge, a higher percentage of dental interns had good knowledge and a small but significant number of dental interns had excellent knowledge<sup>(70)</sup>. Compared with medical interns, dental interns were less willing to treat patients with HBV infection. the interns had satisfactory behavior performance, dental interns used face masks more often, Regarding infection control practice the responses on receiving HBV vaccines proved relatively satisfactory; 65.8%, 58.53%, and 91.25% of dental undergraduates, graduates, and medical graduates, respectively reported to have received all three required doses of vaccination<sup>(70)</sup>.

A survey was done by Nagpa et al<sup>(71)</sup>, in 2016, To assess the knowledge, attitude, and practices of dental students about HBV infection at a private dental institution in Mysore, Karnataka, India<sup>(71)</sup>. The study revealed that a total of 88.7% of the students knew about

the transmission of HBV infection<sup>(71)</sup>. The maximum awareness was among final-year students and the minimum among second-year students, but the difference was not statistically significant<sup>(71)</sup>. Only 64% of students were immunized against HBV. The majority of the students (91.1%) agreed to vaccination against HBV infection<sup>(71)</sup>.

A study was performed by Gayathri et al<sup>(72)</sup>, in 2016, to evaluate the hepatitis B virus infection-related awareness among dental graduate students in a University Dental College, India<sup>(72)</sup>. In this study, 90% of the participant were aware of Hepatitis B infection and modes of spread, 62% of them were vaccinated against hepatitis B infections and about 78% of them use personal protection like aprons, eyewear, gloves and mask while treating patients and about 22% of them don't<sup>(72)</sup>.

A study was carried out at the college of health sciences, Obafemi Awolowo University, Nigeria. Watusi et al<sup>(73)</sup>, in 2017, evaluated the attitude of the students towards HBV vaccine and cross-infection practices<sup>(73)</sup>. The study showed that over 80% (83.2%) of the participants had at least a dose of the HBV vaccine while 79.65% completed the three doses<sup>(73)</sup>. A higher proportion of dental students (88.71%) more than medical students (76.47%) received the vaccine while the clinical III students had the highest proportion (86.11%) of vaccine uptake, the majority (94.7%) of the students that did not receive the vaccine cited their busy schedule as the reason for their failure to be vaccinated. There were differences between the proportions of the medical and dental students who always practiced standard precaution but the only activities with statistically significant differences between these two groups were wearing goggles while treating patients, wearing face masks while treating patients, and

taking every patient as a contagious disease risk<sup>(73)</sup>. Medical students tended to wear goggles while treating patients more than their dental counterparts while dental students tended to wear facemasks while treating patients and took patients as contagious disease risks more than their medical counterparts Taking every patient as a contagious disease risk (86.5%), washing hands after contact with patients' body fluids (82.1%) and wearing gloves before touching mucous membranes and non-intact skin (74.1%) were the most practiced universal standard precaution items<sup>(73)</sup>.

Another survey was done by Peeran et al<sup>(66)</sup>, in 2017, to assess the knowledge and attitude of the graduating dentist from the Faculty of Dentistry, Sebha University (Libya), toward hepatitis B infection<sup>(66)</sup>. It was found that the graduating dental students from different study years have similar knowledge and attitude, except for the responses to questions on curriculum, contracting hepatitis B virus (HBV) from a patient, vaccination schedule, perception, and treatment modality for HBV-infected patient<sup>(66)</sup>. In the attitude section, interns and 4<sup>th</sup>-year students expressed significantly more willingness to treat patients with HBV<sup>(66)</sup>.

A survey was conducted by Malhotra et al<sup>(67)</sup>, in 2017 to assess knowledge, attitude, and practices regarding infection control measures among dental students of Government Dental College in Punjab<sup>(67)</sup>. The result showed that students have sufficient knowledge regarding hepatitis B, third and final year students have significantly less mean knowledge and practice scores compared to interns and postgraduate students, the majority of students have a positive attitude and were willing to perform any procedure on hepatitis B-infected

patient Regarding vaccination status, 32.47% students did not complete their hepatitis B vaccination schedule<sup>(67)</sup>.

An analytical study was done by Thomas Khomotjo Madiba et al<sup>(6)</sup>, in 2018, the study aimed to determine the knowledge and practices of dental and oral hygiene (OH) students related to the transmission and prevention of the hepatitis B virus (HBV)<sup>(6)</sup>. In this study the majority of respondents had an acceptable level of knowledge and displayed acceptable practices concerning the prevention of the spread of HBV, the clinical students had a significantly higher mean score<sup>(6)</sup>. Regarding the practices employed by students in preventing the spread of HBV infection, most of them reported using universal personal protective equipment such as gloves and masks<sup>(6)</sup>. The vast majority of both clinical (94%) and nonclinical students (88%) reported that they had completed the vaccination schedule<sup>(6)</sup>.

A study was done by Assir et al<sup>(74)</sup>, in 2018 to investigate attitude and practice of infection control among senior dental students of the College of Dentistry, King Khalid University, Abha. The result showed that compliance with the use of protective barriers was high except for protective eyewear, utilized by only 22% of students. About 32.9% of 5<sup>th</sup>-year and 19% of 6<sup>th</sup>-year students and 43.6% of interns have taken three doses of hepatitis B vaccination. Only 43.8% of 5<sup>th</sup>-year students, 46.2% of 6<sup>th</sup>-year students, and 31.6% of interns were ready to treat patients with infectious diseases<sup>(74)</sup>.

Also, a cross-sectional survey was done by Saquib et al<sup>(75)</sup>, in 2019, to evaluate the knowledge, attitude, and practice behavior of dental students and interns regarding infection control in central and Southern Western areas in the Kingdom of Saudi Arabia<sup>(75)</sup>. In this study, the

overall knowledge of the participants was poor<sup>(75)</sup>. The attitude was fair, with the females show a significant difference in attitude and practice<sup>(75)</sup>. The overall practice was good, 78.1% were vaccinated against HBV, and 73.2% stated that they regularly use personal protection equipment<sup>(75)</sup>. The higher levels show a good attitude and practice compared with the lower levels<sup>(75)</sup>.

# **Chapter four**

## **Materials and method**

## **Materials and method:**

The present study was a descriptive cross-sectional study, investigated the knowledge, attitude, and practice toward the prevention of hepatitis B virus infection among dental students and Interns. The project was conducted at the University of Benghazi on the undergraduate dental students from the third year to the interns who register in the academic year of 2018/2019. It comprised of the questionnaire. The study commenced in December 2018.

### **4.1 Sample size determination:**

The sample size was computed using the steven Thompson equation. The whole number of undergraduate dental students from the third year to the interns who register in the academic year of 2018/2019 at the University of Benghazi was estimated to be 878. The data was obtained from the registrar's office of the University of Benghazi- faculty of dentistry.

Calculation of sample size:

$$n = \frac{N \times P(1 - P)}{[N - 1 \times (q^2 \div Z^2)] + P(1 - p)}$$

n: sample size

N: population size =878

Z: z value= 1.69

q:proportion of failure =0.05

p:robability of the event occurring by chance=0.50

$$n = \frac{878 \times 0.50(1 - 0.50)}{[878 - 1 \times (0.05^2 \div 1.69^2)] + 0.50(1 - 0.50)}$$

$$n = \frac{878 \times 0.25}{[878 - 1 \times 0.00065] + 0.50(0.5)}$$

$$n = \frac{219,5}{[878 \times 0.00065] + 0.25}$$

$$n = \frac{219.5}{0.5707 + 0.25}$$

$$n = \frac{219.5}{0.8207}$$

$$n = 267$$

According to Steven Thompson equation, the recommended sample size should not be less than 267, however, up to our knowledge there is no previous studies have been conducted locally before and no information was available in this field, so we decided that the final sample size by which we will achieve the precision of 0.05 will be 500 dental students.

#### **4.2 Subjects selection:**

The undergraduate dental students of the University of Benghazi. A random sample from the third year to the intern register in the academic year of 2018/2019 in the faculty of dentistry will be invited to participate. There are no exclusion criteria. Ethical approval was obtained from the dean of the University of Benghazi- faculty of dentistry.



### **4.3 Materials and subjects:**

- Anonymous questionnaires
- Pens

### **4.4 Variables:**

There are two types of variables dependent and independent variables.

#### **1. Dependent variables:**

knowledge score, attitude score, practice score, and KAP score of dental students.

#### **2. Independent variables:**

Age, gender, marital status of the dental students.

### **4.5 Questionnaire:**

The anonymous questionnaire, based on a questionnaire from one of the authors', dr Al-share<sup>(10)</sup>, previously published research, in 2018, was redesigned and standardized for this study. This questionnaire consisted of 24- closed-ended questions divided into four parts. The first part screened the demographic profile of students including, age, gender, and academic level. The second part assessed the knowledge of those students regarding HBV infection and routes of transmission. The third part investigated the behavior and attitude towards HBV infection and infected patients. The last part examined the practices of students regarding protection measures against HBV as well as their HBV vaccination status. Students were asked to fill out the

anonymous self-administered questionnaire at the end of the lectures, or during the clinical sessions.

#### **4.6 Data analysis:**

The data were organized into Microsoft Excel spreadsheets (Microsoft Excel, Microsoft Inc., USA) and Statistical analysis was performed using SPSS for Microsoft Windows, version 23.

Qualitative data were tabulated and summarized in proportions and percentage, Chart type (Bar chart and Pie chart), using multiple response frequencies and crosstabs and Chi\_Square Test.

# **Chapter five**

## **Results**

## Results :

500 students answered the questionnaire with a response rate of 73.5 % (500 out of 680). Results in Table (2) indicate that, overall, a considerable number of respondents (79%) were females, compared to only (21%) of male respondents.

Table (2): Demographic Distribution (gender)%

(Gender/Academic Level)		third year	fourth year	Internship
male	N	44	43	18
	%	8.8%	8.6%	3.6%
female	N	125	120	150
	%	25.00%	24.00%	30.00%
Total	N	169	163	168
	%	33.80%	32.60%	33.60%

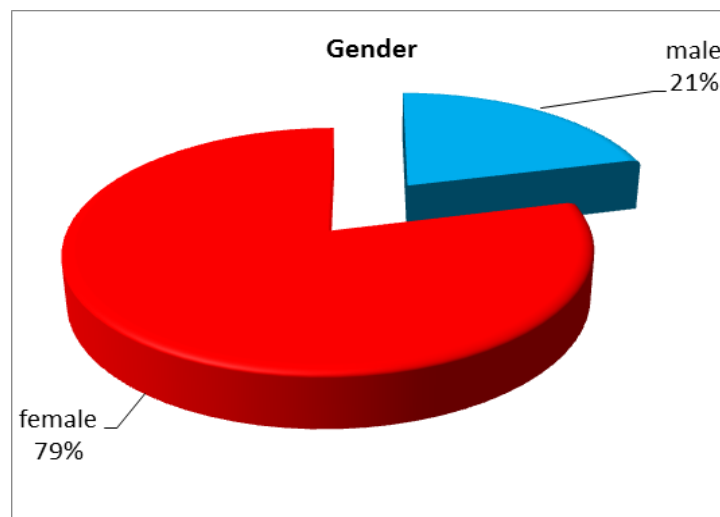


Figure (4): Demographic Distribution (gender)%

The sample comprised an almost equal distribution of dental students from the third year (33.8%), fourth-year (32.6%), and intern (32.6%) (figure 5).

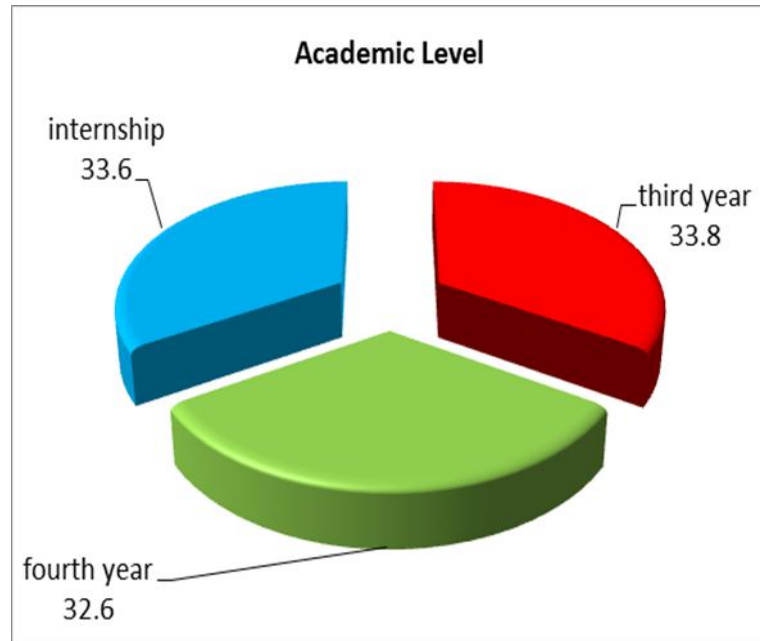


Figure (5): Demographic Distribution (Academic level)%

As this study included college students, the majority of the 90.2% were single, 9% of students were married, and 0.8% were divorced.

Table (3): Demographic distribution marital status %

Marital status	Frequency	Percent
Single	451	90.2
Married	45	9
Divorce	4	0.8
Total	500	100

#### **4.1 Knowledge:**

Table (4) represent the results of the knowledge section of the questionnaire. The questions were in a "yes" and "no" format. There is 12 question in this section.

Table (5) represent the proportions of “correct” responses to the knowledge items. Overall, correct responses varied from (7.6- 97)%. The vast majority knew that HBV can be transmitted from patient to patient 97%, dentists are at higher risk of HBV infection than the other general population 96.6%, HBV can be transmitted through dental treatment 96.4%, and that HBV can be transmitted from dentist to patient 92.8%. On the other hand, only less than 10% of the students knew about the safety of the HBV vaccine and its effectiveness for all ages.

There were no statistically significant differences between males and females except at the question HBV is not infectious outside the body female students were more knowledgeable than male. On other hand, there were significant differences between different academic levels of the students in 4 questions, intern students answer more correctly the question HBV can be transmitted through saliva (e.g. mucosal trauma before treatment) ( 27.6 vs. 22 vs. 29.6 )%, the third and fourth-year students were more knowledgeable about HBV sensitivity to low temperature, dryness and ultraviolet rays than intern students (25.2 vs. 25.2 vs. 21.6)%, third-year students were more knowledgeable than a fourth-year and intern students regarding the ability of HBV to survive on unsterilized surfaces (30.8 vs. 25.2 vs.21.8) %, and fourth-year students answer more correctly than a

third-year and intern students the question HBV vaccine is safe and effective for all ages (0.8 vs. 3.6 vs.3.2)%.

Table (4): The knowledge items regarding H BV Infection-%

N			Gender		Academic Level		
			male	female	third year	fourth year	internship
1	HBV can be transmitted through saliva (e.g. mucosal trauma before treatment)	NO	3.8	17	6.2	10.6	4
		Yes	17.2	62	27.6	22	29.6
2	HBV can be transmitted from dentist to patient	NO	2	5.2	3.6	1.4	2.2
		Yes	19	73.8	30.2	31.2	31.4
3	HBV can be transmitted from dentist to patient(e.g.non-sterile medical devices)	NO	0.6	1.4	1	0.6	0.4
		Yes	20.4	77.6	32.8	32	33.2
4	Dentists are at higher risk of HBV infection than the other general population	NO	1.2	2.2	0.8	1.4	1.2
		Yes	19.8	76.8	33	31.2	32.4
5	HBV can be transmitted through dental treatment	NO	0.6	3	1.8	1	0.8
		Yes	20.4	76	32	31.6	32.8
6	HBV is less transmissible than HIV	NO	16.6	65.8	29.4	26.6	26.4
		Yes	4.4	13.2	4.4	6	7.2
7	HBV is sensitive to low temperature, dryness and ultraviolet rays	NO	14.8	57.2	25.2	25.2	21.6
		Yes	6.2	21.8	8.6	7.4	12
8	HBV is resistant to alcohol and some detergents	NO	10	36.6	15.2	15.2	16.2
		Yes	11	42.4	18.6	17.4	17.4
9	HBV is not infectious outside the body (in the environment)	NO	11.6	53.2	24	20	20.8
		Yes	9.4	25.8	9.8	12.6	12.8
10	HBV can survive for a prolonged period on unsterilized surfaces	NO	4.8	17.4	3	7.4	11.8
		Yes	16.2	61.6	30.8	25.2	21.8
11	HBV vaccine is safe and effective for all ages	NO	1.4	6.2	0.8	3.6	3.2
		Yes	19.6	72.8	33	29	30.4
12	Is a vaccination of HBV for life	NO	9.4	33.2	15.4	15	12.2
		Yes	11.6	45.8	18.4	17.6	21.4

Table (5): Correct responses to the knowledge items regarding Hepatitis B Virus Infection%.

N	Question	Correct response	Gender		p_value	Academic Level			p_value	total
			male	female		third year	fourth year	intern		
1	HBV can be transmitted through saliva (e.g. mucosal trauma before treatment)	Yes	17.2	62	0.442	27.6	22	29.6	0.00*	79.2
2	HBV can be transmitted from dentist to patient	Yes	19	73.8	0.3	30.2	31.2	31.4	0.08	92.8
3	HBV can be transmitted from patient to patient e.g.non-sterile medical devices	Yes	20.4	77.6	0.48	32.8	32	33.2	0.503	97
4	Dentists are at higher risk of HBV infection than the other general population	Yes	19.8	76.8	0.141	33	31.2	32.4	0.618	96.6
5	HBV can be transmitted through dental treatment	Yes	20.4	76	0.646	32	31.6	32.8	0.316	96,4
6	HBV is less transmissible than HIV	NO	16.6	65.8	0.31	29.4	26.6	26.4	0.121	82.4
7	HBV is sensitive to low temperature, dryness and ultraviolet rays	NO	14.8	57.2	0.696	25.2	25.2	21.6	0.02*	72
8	HBV is resistant to alcohol and some detergents	Yes	11	42.4	0.814	18.6	17.4	17.4	0.837	53.4
9	HBV is not infectious outside the body (in the environment)	NO	11.6	53.2	0.021	24	20	20.8	0.115	64.8
10	HBV can survive for prolonged period of time on unsterilized surfaces	Yes	16.2	61.6	0.855	30.8	25.2	21.8	0.00*	77.8
11	HBV vaccine is safe and effective for all ages	NO	1.4	6.2	0.685	0.8	3.6	3.2	0.006*	7.6
12	Is a vaccination of HBV for life	NO	9.4	33.2	0.614	15.4	15	12.2	0.129	42.6



More than 50% of the students knew about the incubation period of the hepatitis B virus. ( Figure 6)

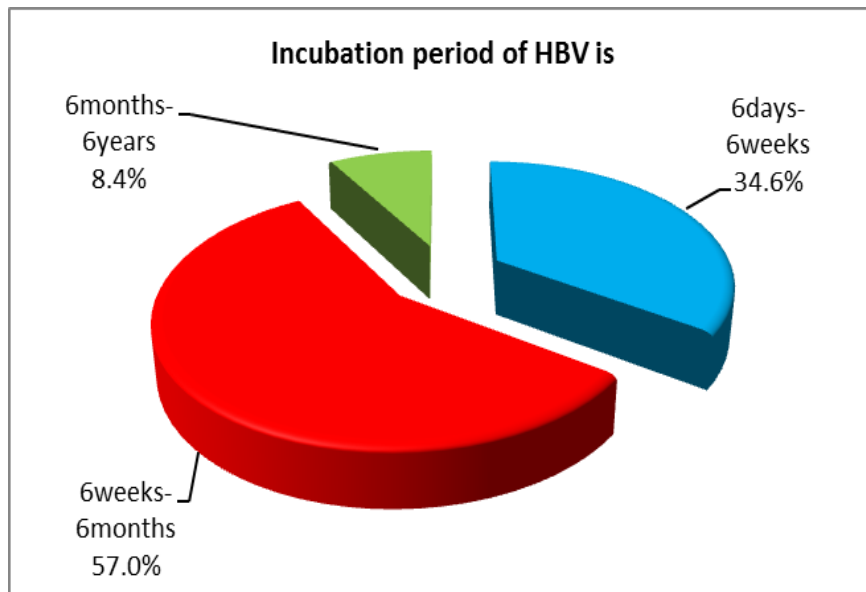


Figure (6): Knowledge regarding the incubation period of HBV %.

The prevalence of hepatitis B in Libya was known by 25% of the students (figure 7).

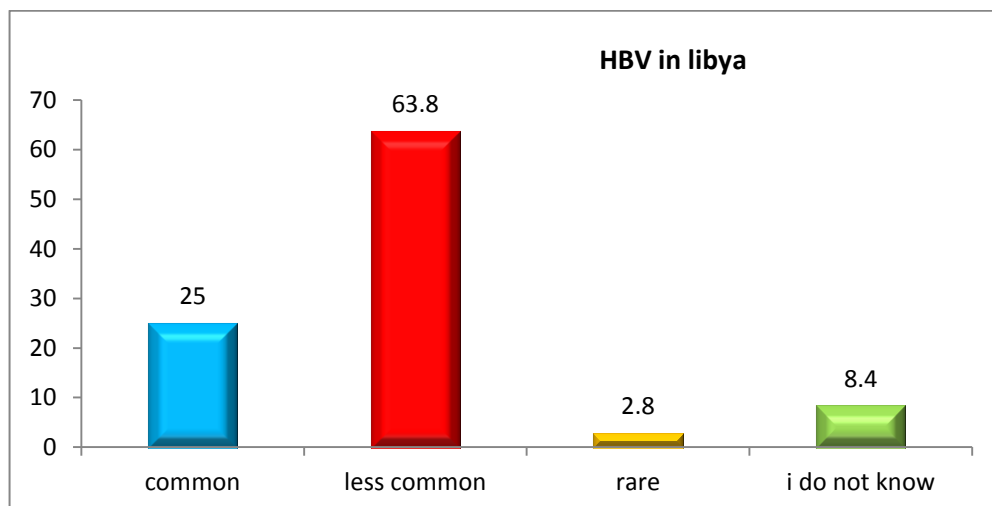


Figure (7): Knowledge regarding the prevalence of hepatitis B in Libya %.

The students' knowledge regarding the modes of HBV transmission is shown in (Table 6). Table (7) represent the proportions of “correct” responses to knowledge regarding HBV Modes of Transmission-%, the correct answers ranged between (99– 17.4)% with no significant differences between males and females. From Tables 8 it can be seen that the vast majority of the students knew that HBV can be contracted from needle stick injuries (NSI) 99%. On the other hand, only less than 10% of the students knew about the transmissibility of HBV through saliva.

There were significant differences between different academic levels of the students in 5 items, the first one is related to the possibility of HBV transmission through blood, the third-year students were more knowledgeable than fourth-year and intern students (33.2 vs. 32.6 vs. 32.2%). The second item is the transmissibility of HBV through Sneezing and coughing of an infected person, fourth-year students were more knowledgeable than third-year and intern students (6 vs. 16 vs. 9.2%). The third item is the transmissibility of HBV through saliva, fourth-year students were more knowledgeable than third-year and intern students (3.2 vs.10.4 vs. 3.8%). The fourth item is the transmissibility of HBV through breast milk, fourth-year students were more knowledgeable than third-year and intern students (10.8 vs. 16.8 vs. 11.8)%. The last item is the transmissibility of HBV through drinking from the same cup used by an infected person, fourth-year students were more knowledgeable than third-year and intern students (10.2 vs. 15.8 vs. 7% ).

Table (6): responses to knowledge regarding HBV Modes of Transmission- frequency,%

<b>N</b>	<b>Questions</b>	<b>response</b>	<b>Frequency</b>	<b>%</b>
1	Needle stick injuries	agree	495	99
		disagree	5	1
2	Through blood	agree	490	98
		disagree	10	2
3	Infected mothers during delivery to their infants	agree	382	76.4
		disagree	118	23.6
4	Sexual intercourse	agree	442	88.4
		disagree	58	11.6
5	Sharing of a toilet with an infected	agree	325	65
		disagree	175	35
6	Hugging of infected person	agree	146	29.2
		disagree	344	70.8
7	Sneezing and coughing of an infected person	agree	156	68.8
		disagree	413	31.2
8	By saliva	agree	413	82.6
		disagree	87	17.4
9	Through breast milk	agree	305	61
		disagree	195	39
10	Drinking from the same cup used by infected person	agree	335	67
		disagree	165	33
11	Shaking hand with infected person	agree	131	26.2
		disagree	369	73.8

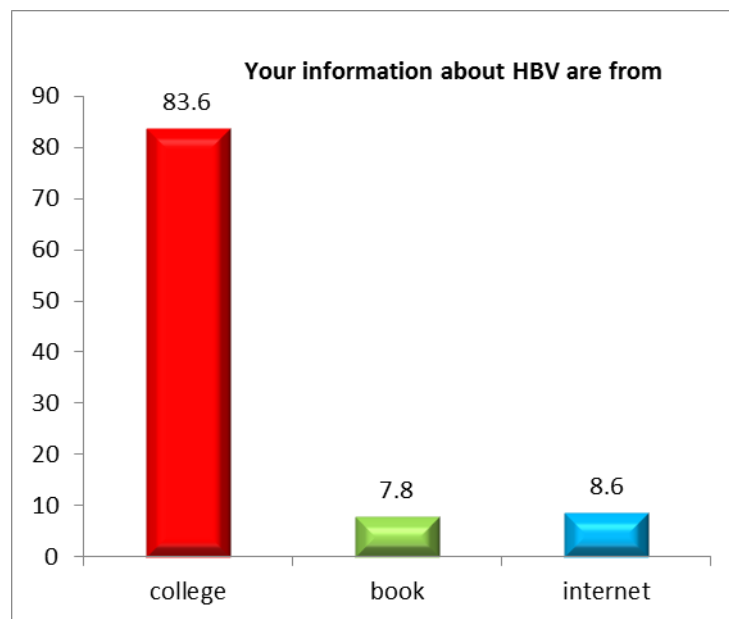
Table(7): Correct responses to knowledge regarding HBV Modes of Transmission-%

N	Mode of transmission	Correct response	Gender			Academic Level				Total
			male	female	p-value	third year	fourth year	Interns	p-value	
1	Needlestick injuries	agree	21	78	0.247	33.6	31.8	33.6	0.065	99
2	Through blood	agree	21	77	0.1	33.2	32.6	32.2	0.025*	98
3	Infected mothers during delivery to their infants	agree	16	60.4	0.955	26.8	23.6	26	0.313	76.4
4	Sexual intercourse	agree	18.6	69.8	0.951	31	28	29.4	0.229	88.4
5	Sharing of a toilet with an infected person	disagree	8.6	26.4	0.15	13	11.2	10.8	0.467	35
6	Hugging of infected person	disagree	14.2	56.6	0.42	24.4	23.4	23	0.711	70.8
7	Sneezing and coughing of an infected person	disagree	6.6	24.6	0.955	6	16	9.2	0.00*	31.2
8	By saliva	disagree	2.6	14.8	0.127	3.2	10.4	3.8	0.00*	17.4
9	Through breast milk	disagree	7.6	31.4	0.507	10.8	16.4	11.8	0.001*	39
10	Drinking from the same cup used by infected person	disagree	6	27	0.278	10.2	15.8	7	0.00*	33
11	Shaking hand with infected person	disagree	15.2	58.6	0.71	24.6	25.6	23.6	0.215	73.8

Regarding sources of knowledge, the college was the most frequent source (83.6%) (Table8).

Table (8): sources of knowledge %

<b>Your information about HBV are from</b>	<b>Frequency</b>	<b>Percent</b>
College	418	83.6
Book	39	7.8
Internet	43	8.6
Total	500	100



Figure(8): sources of knowledge %

## **4.2 Attitude:**

There were six statements to assess students' attitudes towards HBV patients. All the statements were in an "Agree" and "Disagree" format. Table (9) shows the response of participants to each question that assesses their attitude toward patients infected with HBV. Overall the students presented a positive level of attitude towards HBV-positive patients, with no statistically significant differences between males and females. On other hand, there were statistically significant differences between the different academic levels of the students. Intern students showed a better attitude than their counterpart third and fourth-year students.

Table(9) : Attitude toward hepatitis B virus infection - %.

N		Response	Gender			Academic level				Total
			Male	female	p-value	Third-year	Fourth-year	Interns	p-value	
1	I have moral responsibility to treat patients with HBV infection	Agree	16.6	66.2	0.25	29.2	22.8	30.8	0.00*	82.8
		Disagree	4.4	12.8		4.6	9.8	2.8		17.2
2	I will treat patients with HBV infection	Agree	17.8	65.2	0.589	29	23.6	30.4	0.00*	83
		Disagree	3.2	13.8		4.8	9	3.2		17
3	I can safely treat patients with HBV infection	Agree	15.8	57.6	0.632	25.6	21.4	26.4	0.02*	73.4
		Disagree	5.2	21.4		8.2	11.2	7.2		26.6
4	I will let dentists treating patients with HBV treat my teeth	Agree	12.2	42.4	0.418	20.4	15.8	18.4	0.094	54.6
		Disagree	8.8	36.6		13.4	16.8	15.2		46.4
5	Dentists have the rights to know their patients HBV infection	Agree	19.8	70.8	0.145	32.2	28.2	30.2	0.022*	90.6
		Disagree	1.2	8.2		1.6	4.4	3.4		9.4
6	I am worried about being infected with HBV by my patients	Agree	17.6	65.8	0.899	31	26.8	25.6	0.001*	84.4
		Disagree	3.4	13.2		2.8	5.8	8		16.6

### **4.3 Practice:**

Practices towards HBV were assessed as shown in Table (10). The use of 5 items by students was assessed. Face masks and gloves are used by the vast majority of dental students, with no statistically significant differences according to gender. On the other hand, there were significant differences between the different academic levels of the students in three items of students' use of personal protective equipment. Significantly more third-year students reported always wearing protective eyewear (16.2 % vs. 11.4 % vs. 10.4%), disposable caps (18% vs. 14.2% vs. 14.4%), gowns (26.2% vs. 23.6% vs. 23.8%) than a fourth-year and intern students.

### **4.4 vaccination:**

Table (11) shows the vaccination status of the participants. The results of the study indicate that 93% of the students had taken the vaccination, out of which only 46.2% of them completed their full course of vaccination with a significant difference according to the academic level, intern students reported vaccinated more than third and fourth-year students (7.4% vs. 18% vs. 20.8%). There was a significant difference between males and females among students who had taken the vaccination, more female students reported vaccinated than male students (72.2 % vs. 20.8%). Also, there was a statistically significant difference between different academic levels of the students, third-year students reported vaccinated more than the fourth year and intern students (33.2% vs. 31.4 % vs. 28.4 %). Less than 10% did not receive the vaccine. (Figure 9).



Table (10): Student's use of Personal Protective Equipment - %

N				always	mostly	sometimes	rarely	never	p-value
1	Gloves	Gender	male	20	1	0	-	-	0.294
			female	76.2	2	0.8	-	-	
	Academic Level	third year	32.2	1	0.6	-	-	0.434	
		fourth year	31.8	0.8	0	-	-		
		internship	32.2	1.2	0.2	-	-		
		total	96.2	3	0.8	-	-		
2	Mask	Gender	male	17.6	4.6	0	-	0.2	0.007
			female	73.6	4.6	0.6	-	0.2	
	Academic Level	third year	30.8	2	0.6	-	0.4	0.058	
		fourth year	29.2	3.4	0	-	0		
		internship	31.2	2.4	0	-	0		
		total	91.2	7.8	0.6	-	0.4		
3	Protective eye wear	Gender	male	7.6	3.2	4.4	2.4	3.4	0.942
			female	30.4	10	15.2	9.8	13.6	
	Academic Level	third year	16.2	6.6	4.8	2.4	3.8	0.00*	
		fourth year	11.4	2.8	8.2	4.6	5.6		
		internship	10.4	3.8	6.6	5.2	7.6		
		total	38	13.2	19.6	12.2	17		
4	Disposable Caps	Gender	male	8.6	0.4	1.8	1.8	8.4	0.059
			female	38	5.6	6.6	7.2	21.6	
	Academic Level	third year	18	2	3.8	3	7	0.002*	
		fourth year	14.2	2.2	2.6	4.4	9.2		
		internship	14.4	1.8	2	1.6	13.8		
		total	46.6	6	8.4	9	30		
5	Gowns	Gender	male	16.4	1.2	0.8	1.2	1.4	0.415
			female	57.2	6.4	6.4	3	6	
	Academic Level	third year	26.2	3.2	2.4	1.2	0.8	0.012*	
		fourth year	23.6	3.2	2.4	1	2.4		
		internship	23.8	1.2	2.4	2	4.2		
		total	73,6	7.6	7.2	4.2	7.4		

Table (11): HBV vaccination – %.

N			Gender			Academic Level			
			male	female	p-value	third year	fourth year	internship	p-value
1	Have you been vaccinated against HBV	No	0.2	6.8	0.006*	0.6	1.2	5.2	0.00*
		Yes	20.8	72.2		33.2	31.4	28.4	
2	How many doses of HBV vaccine did you receive	Not received before	1	6.4	0.021*	0.8	1.6	5	0.00*
		one dose	1.8	6.8		2.6	3.2	2.8	
		tow dose	10.6	27.2		23	9.8	5	
		three dose	7.6	38.6		7.4	18	20.8	

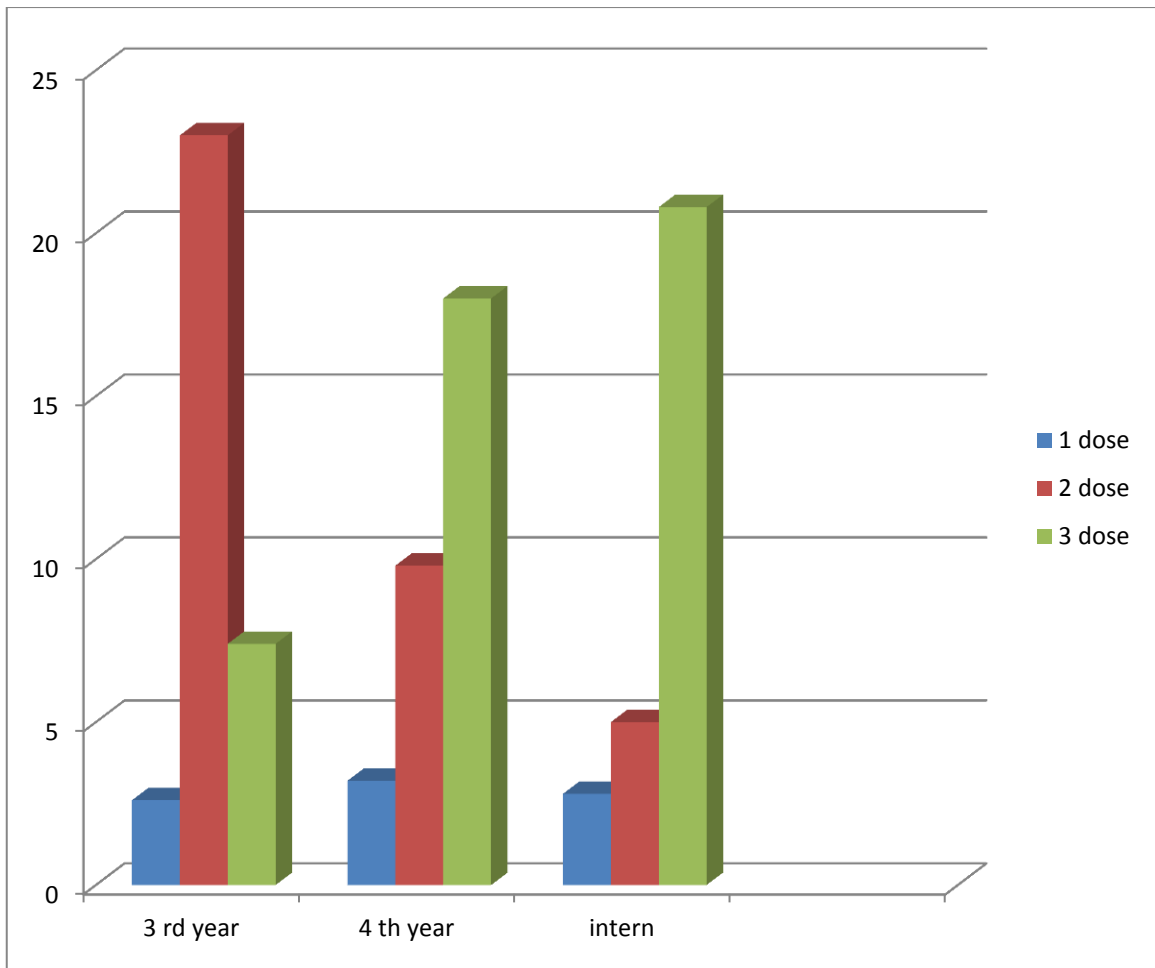


Figure (9): Doses received by students– %.

# **Chapter six**

## **Discussion**

## **Discussion:**

Dentists are repeatedly exposed to many microorganisms present in blood and saliva<sup>(76)</sup>. As a consequence, the incidence of certain diseases is high among them when compared to the general population<sup>(76)</sup>. Dental students are the future dental professionals, who will provide oral health care for the general population<sup>(76)</sup>. They tend to study and practice infection control procedures that they acquired during their training in dental school, so it is the responsibility of academic institutions to facilitate appropriate preclinical immunization and provide training in infection control to substantiate a protective environment for dental students and patients<sup>(76)</sup>.

In human health research, KAP studies of specific populations could be conducted to assess the KAP towards a specific disease<sup>(77)</sup>. These studies help to understand what people knew about a specific disease (transmission, symptoms, ability to diagnose intervention necessity, and risk behavior)<sup>(77)</sup>. KAP surveys showed also feelings of people towards the disease (were if they scared of getting infected, were if they willing to protect themselves against it, and were if they aware of the danger of the disease?)<sup>(77)</sup>. So assessing people's knowledge is a useful step to assess the extent to which an individual or community is in a position to adopt a disease risk-free behavior for this disease, and for this, our descriptive cross-sectional study was conducted on dental students at the University of Benghazi investigated the knowledge (which included general information, transmission, and vaccination), attitudes (which included perception toward hepatitis B patients ) and practices of them toward prevention of HBV infection.

The sample size was 500 students that surpassed the number recommended by Thompson equation for the size of the targeted population, which was the dental students at the University of Benghazi were (878). The study achieved a good response rate of 73.5% (500/680). This means that the results were adequately representative of the target population from which it was drawn as it was above the required 70% response rate<sup>(78)</sup>. The result of this study revealed a higher number of female participants than male. This could be attributed to the fact that; there was an expansion of the number of females in dental college.

The knowledge, attitude, and practice regarding HBV infection among dental students and Interns were assessed by questionnaire. The questionnaires were answered by each student sometimes clarification of some questions was needed especially for third-year students.

Based on the results of this study, we can infer that Libyan dental students at the University of Benghazi have a good level of knowledge about HBV-related issues (10 out of 12 items with the correct response above 50%). Furthermore, more than 90 percent answered four questions correctly which are HBV can be transmitted from dentist to patient, HBV can be transmitted from patient to patient e.g. non-sterile medical devices, dentists are at higher risk of HBV infection than the other general population and HBV can be transmitted through dental treatment. These findings were in agreement with the results of a research held by Kumar et al, (2015)<sup>(79)</sup> in India who reported a good level of knowledge regarding hepatitis B infection. Another study was done by Mane et al, (2018)<sup>(80)</sup> on dental students in Maharashtra indicated that they also had good

knowledge about HBV infection. In contrast, Al-shamiri (2018)<sup>(10)</sup>, found that Saudi dental students had a fairly unsatisfied level of knowledge regarding HBV infection. These differences may be due to two-thirds of the sample were from private dental schools in Saudi, and the absence of continuous formal school-based education of communicable diseases for students in the curriculum of the college might be the most important reason for a lower level of knowledge about HBV among them.

There were no statistically significant differences between males and females except at the question HBV is not infectious outside the body female students were more knowledgeable than male. Although one might expect that knowledge level will upgrade by year, but in our study, the level of knowledge was higher for the lower levels compared with senior ones. This finding may be explained by the fact that; in the third year, students completed their preclinical courses and begin with clinical practice. At the beginning of clinical rounds in each department, students are introduced to infection control procedures and the proper use of personal protection equipment. These results were consistent with the findings of the study conducted by Xinyi Li et al (2015)<sup>(70)</sup>. In contrast, Brailo (2011)<sup>(68)</sup>, found that Croatian dental students' knowledge regarding HIV and viral hepatitis increased with each year of study. This fact can be associated with an increasing number of courses that focus more on the care of medically compromised patients, also Malhotra et al, (2017)<sup>(67)</sup> reported in their similar study that Third and final year students have a significantly less mean knowledge score as compared to interns and postgraduate students, this difference may be because of the small sample size of

this study compared to our study and postgraduate dental students and medical intern students also enrolled in this study.

More than 90 % of the students believed that the HBV vaccine is safe and effective for people of all ages, This is consistent with the result reported by Al-shamiri et al (2018)<sup>(10)</sup>. Besides, Findings from the study revealed that more than 70% of the students know that HBV is not sensitive to low temperature, dryness, and ultraviolet ray, which were encouraged because this statement is the core theory to develop HBV prevention, These findings were, however, at variance with another study done in Chinese dental students by Xinyi Li et al (2015)<sup>(70)</sup> reported that The accuracy of the question “HBV is sensitive to low temperature, dryness, and ultraviolet ray was below 20% for overall respondents. This may be attributable to the fact that they studied also postgraduate dental students and medical intern students dental students, and less number of students participated in this study compared to our study.

In this study, more than 80% of the students recognized that HBV is more easily transmitted than HIV. The current findings were better compared to those found by Jain et al (2014)<sup>(81)</sup> where less than one-fifth of the students believed that HBV is not highly infectious and widely transmitted as HIV this low percentage may be attributable to the fact that they studied only intern students, and the lectures on HBV are offered in the 2<sup>nd</sup> and 3<sup>rd</sup> year of study in the dental college, and as a result, the intern students may have forgotten this knowledge and the wrong understanding of HIV being easier transmissible than HBV is common in many societies where HIV is a source of panic and stigma. In another hand, this finding was similar to other studies<sup>(10,67,82)</sup>.



The present study showed that less than 50% of students believed that vaccination of HBV is for life, the current finding was better compared to which found by Ali Shigri et al, (2015)<sup>(83)</sup>. Furthermore, the knowledge of the student about the prevalence of hepatitis B infections in the Libyan population is low (25%), which may lead to inadequate risk perception among them. These findings are similar to the results of a study conducted in Iran by Alavian et al, (2010)<sup>(11)</sup>.

In this study, the level of knowledge regarding mode of HBV transmission was found to be fairly acceptable (only 6 items out of 11 got a response above 50%), there were no statistically significant differences between male and female, Similar results were found in previous studies assessing HBV knowledge in dental students worldwide<sup>(69,72,80)</sup>. When the comparison was made based on the year of study, the knowledge regarding mode of HBV transmission level was slightly better in the fourth-year students as compared to third-year students and interns, with statistically significant differences in 5 items, which are the possibility of HBV transmission through blood, Sneezing and coughing of an infected person, saliva, breast milk and drinking from the same cup used by an infected person.

The majority of the dental students in this study identified contaminated needles (99%), and blood (98%) as the most important route of HBV transmission. This finding is consistent with the finding of Malhotra et al (2017)<sup>(67)</sup> and Gayathri et al (2016)<sup>(72)</sup>. Nevertheless, unfortunately, less than one-fifth of the students (17.4%) thought HBV spreads by saliva, this goes hand in hand with the findings of Alshamiri et al (2018)<sup>(10)</sup>. Less than 40% of the students correctly perceived that HBV cannot be transmitted through casual contacts, such as Sharing a toilet with an infected person (35%), Sneezing and

coughing of an infected person (32.2%), Drinking from the same cup used by an infected person (33%), and through breast milk (39%). These findings were in agreement with the results of research held by Al-shamiri et al (2018)<sup>(10)</sup>. Meanwhile, The current findings were better compared to those found by Malhotra et al (2017)<sup>(67)</sup>, This could be due to less number of students who participated in this study compared to our study and also postgraduate dental students and medical interns students enrolled in this study.

Finally, the major source of information about the Hepatitis B Virus (HBV) infection was the collage. This finding is, however, at variance with another study done by Atlam et al(2016)<sup>(84)</sup>, where the respondents demonstrated that the electronic and Mass Media were more common sources of knowledge this may be due to the accessibility of these two sources are wider and easier, and the sample was from medical students.

Although dental students at the University of Benghazi have a good level of knowledge about HBV-related issues, certain gaps in their knowledge were also found. Areas of poor knowledge in this study included some of the modes of infection transmission, the prevalence of hepatitis B infections in the Libyan population, and prevention of hepatitis B infections.

Regarding the six statements on attitude, most students were inclined to choose “agree” which reflected a positive attitude toward the HBV infected patient. Generally, the positive attitude of dental students towards treating high-risk patients and high level of concern for their health and risk of the virus transmission to others were consistent with the results of previous studies<sup>(68,70,75,76,85)</sup>, and in

contradiction to the present study Motahir Al-shamiri et al (2018)<sup>(10)</sup> this may be attributable to be due to two-thirds of the sample were from private dental schools in Saudi, stated that Saudi dental students showed a negative attitude toward HBV infected patients. Our study showed that no statistically significant differences between males and females. On other hand, there were statistically significant differences between different academic levels of the students, these results were consistent with a study done by Saquib(2019)<sup>(75)</sup>.

It is surprising to find out that; despite most of the intern showed a low level of knowledge, they showed the highest level of attitude, This was convenient with the result of the study done by Saquib(2019)<sup>(75)</sup>, which may indicate that they get familiar with cross-infection control measures to the level it is done routinely and that the infection control measures is restricted. This finding was, however, at variance with another study done on Chinese dental students by Xinyi Li et al (2015)<sup>(70)</sup>. This may be ascribed to that dental interns are more likely exposed to high-risk factors of HBV infection like blood and saliva, making them less willing to deal with HBV patients.

In previous studies, it has been shown that a sense of moral responsibility is important in accepting infectious patients<sup>(86)</sup>. Therefore, it is one of the strongest factors, which can predict the avoidance of treating these patients. In our study, the majority of students stated that they have a moral responsibility towards the treatment of HBV-positive patients which is in agreement with another study done on Chinese dental students by Xinyi Li et al (2015)<sup>(70)</sup>. The current findings were better compared to those found by a study conducted among Libyan dental students in Sebha University by Peeran et al (2017)<sup>(66)</sup>. This could be due to less number

of students participated in this study compared to our study and most of them from the third year.

More than 70% of the students stated that they were able to treat the patients safely, the finding was following results reported by Hashem-Motahir Al-shamiri (2018)<sup>(10)</sup>. Unfortunately, only almost half of our students agree with that statement "I will let dentists treating patients with HBV treat my teeth", this finding was similar to the study done by Gomathi TP et al (2016)<sup>(85)</sup>. Despite, more than 80% of the students have a strong worry about getting infected while treating a patient, the same percentage were willing to treat patients with HBV, these findings were following a previous study done on Chinese dental students by Xinyi Li et al (2015)<sup>(70)</sup>. Furthermore, the majority of students (90.6) years felt that the patient should inform them correctly about his hepatitis B-positive status, this finding was in line with a study on dental students in Sebha University by Peeran et al (2017)<sup>(66)</sup>.

"Prevention is better than cure". We are all familiar with this adage. However, prevention can only be possible when there is knowledge, so the dentists should be provided with proper health education on the precautions that are to be taken while treating the patients infected with HBV viruses. They should be well aware of the WHO recommendations and the use of disposable mouth masks and gloves regularly while treating any patient with such a medical history<sup>(87)</sup>.

Based on the results of this study, we can deduce that; the response of dental students to the use of personal protective equipment was adequate, Similar findings have been reported in some previous studies<sup>(10,70,88)</sup>. The practice of standard precautions including the use of barrier techniques is the best prevention strategy against

occupational transmission of infectious diseases in health care settings. In the present study, there was high compliance with glove and mask use, similar to previous studies conducted in Iran, Saudi Arabia<sup>(10,88)</sup>, China<sup>(70)</sup>, and Jordan<sup>(89)</sup>. Nonetheless, compliance with protective eyewear and disposable Caps was low; only less than 50% of the students using protective eyewear at all times. These results, however, were not peculiar to the present study, as many other studies in Saudi Arabia<sup>(10)</sup>, Nigeria<sup>(90)</sup>, UAE<sup>(91)</sup>, and Yemen<sup>(89)</sup> have also shown that a majority of dental students did not use eye protection most of the time, The poor utilization of eyewear may indicate a low level of awareness among students and dentists about the probability of disease transmission via aerosols and blood splashes. Hence, dental students should be encouraged to wear masks and protective eyewear to minimize the chance of transmitting airborne infections.

The most effective means to prevent HBV infection is through vaccination. In our study, more than 90% of the students were vaccinated, These results are consistent with those found in the study done in Saudi Arabia<sup>(10)</sup> and UAE<sup>(91)</sup>. This rate is higher than that reported by other studies in Yemen<sup>(92)</sup>. Among the vaccinated students in our study, only more than 40% completed the required dosage (three doses) needed to obtain adequate immunity. The significant difference between males and females. In our study, there was a significant difference between males and females, and more female students completed vaccinated than male students, This fact can be attributed to the historical concern of women regarding preventive measures, which is in agreement with a previous study conducted by Halboub et al (2015)<sup>(92)</sup>.

Despite the large sample size and the good response rate of the present survey, several potential limitations should be taken into consideration. One limitation is the fact that the responses were subjective (i.e. based on students' self-report) rather than being provided under supervision in a clinical environment, and therefore the results may not necessarily fully reflect students' real knowledge and daily professional practice. Additionally, this number of questions cannot show the real knowledge and practice of the respondents. Nevertheless, the number of questions was kept to a minimum to improve the response rate, which appeared to work well. Despite these limitations, however, this study provides some important information about Libyan dental students' knowledge, attitude, and practices regarding infection control. Such information should help identify areas that need reinforcement or greater emphasis in the dental curriculum.

The current study was the first study, which explored Hepatitis B related knowledge, attitude, and practice among dental students of the University of Benghazi. The present study concluded that the majority of the study participants had good knowledge about HB as a serious disease, with areas of insufficient knowledge included some modes of transmission. Also, The findings of this study revealed that the attitude of the dental students towards HB positive patients was positive but greater compliance was needed.

The response of dental students to the use of personal protective equipment was adequate but, some of the students were not vaccinated against HBV, which made them more vulnerable to HBV infection. As the students have an increased risk of acquiring injuries while performing dental procedures involving blood and saliva, the students

should be routinely immunized when they enter the dental college. It is recommended that a policy be made, under which health education and complete vaccination of all the dental students concerning HBV infection be made mandatory before entering the clinics, and knowledge in regards to the booster dose are to be highlighted as HBV is easier to transmit than HIV. Also, the students act as a source of knowledge for their families and also for the patients, more efforts are needed to provide formal and obligatory education about Hepatitis B infection, its transmission, prevention along with an update on infection control practices for the dental students.

Due to ethical reasons, no blood samples were drawn, so the hepatitis B antibody titer was not confirmed, and future studies should be done to check the hepatitis B antibody titer among the dental students.

The dental students must be aware of the risks and the seriousness of the infection, and last comprehensive, extended sampling of dental students from all the dental colleges as well as medical, nursing schools should be recommended in the future not only for HBV but all the infectious diseases especially on the COVID 19.

# **Chapter seven**

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السيد عميد كلية طب وجراحة الاسنان :

بعد التحية

اتقدم بهذا الطلب لغرض الموافقة علي توزيع استبيان بخصوص جمع بيانات متعلقة بدراسة ماجستير بقسم طب الاسنان الوقائي تحت عنوان مدى معرفه وموقف وممارسة طلاب كليه طب الاسنان بجامعة بنغازي تجاه منع انتشار فيروس التهاب الكبد الوبائي (ب).


ولكم جزيل الشكر والتقدير علي تعاونكم

مقدمة الطالب : د/ابتسام بنكيه

طالبة دراسات عليا بقسم طب الاسنان الوقائي

2019.4.8

للاطلاع  
2019  
9.4



Handwritten signature and date: 9/4/2019

Knowledge, attitudes and practices toward prevention of hepatitis B virus infection among dental students at Benghazi university

Age:

.....

Gender:

a) Male

b) Female

Academic level:

a) Third year

b) Fourth year

c) Internship

Marital status:

a) Single

b) Married

c) Divorce

1. HBV can be transmitted through saliva (e.g. mucosal trauma before treatment):

Yes

No

2. HBV can be transmitted from dentist to patient:

Yes

No

3. HBV can be transmitted from patient to patient (e.g. non-sterile medical devices):

Yes

No

4. Dentists are at higher risk of HBV infection than the other general population

Yes

No

5. HBV can be transmitted through dental treatment:

Yes

No

6. HBV is less transmissible than HIV:

Yes

No

7. HBV is sensitive to low temperature, dryness and ultraviolet rays:

Yes

No

8. HBV is resistant to alcohol and some detergents:

Yes  No

9. HBV is not infectious outside the body (in the environment):

Yes  No

10. HBV can survive for prolonged period of time on unsterilized surfaces:

Yes  No

11. HBV vaccine is safe and effective for all ages:

Yes  No

12. Incubation period of HBV is:

6 days – 6 weeks  6 weeks – 6 months  6 months – 6 years

13. Modes of HBV transmission include the following:

Modes of transmission	Agree	Disagree
Needle stick injuries		
Through blood		
Infected mothers during delivery to their infants		
Sexual intercourse		
Sharing of a toilet with an infected person		
Hugging of infected person		
Sneezing and coughing of an infected person		
By saliva		
Through breast milk		
Drinking from the same cup used by infected person		
Shaking hand with infected person		

14. HBV in Libya is

Common  less common  rare  I do not know

15. Is a vaccination of HBV for life

Yes  No

16. "I have moral responsibility to treat patients with HBV infection"

Agree  Disagree

17. "I will treat patients with HBV infection":

Agree  Disagree

18. "I can safely treat patients with HBV infection":

Agree  Disagree

19. "I will let dentists treating patients with HBV treat my teeth":

Agree  Disagree

20. "Dentists have rights to know their patients' HBV infection status":

Agree  Disagree

21. "I am worry about being infected with HBV by my patients":

Agree  Disagree

22. Please check which of the following Personal Protective Equipment (PPE) you use:

PPE	Always	Mostly	Sometimes	Rarely	Never
Gloves					
Mask					
Protective eye wear					
Disposable caps					
Gowns					

23. Have you been vaccinated against HBV?

Yes  NO

24. How many doses of HBV vaccine did you receive

Not received before  One dose  Two dose  Three dose

25. Your information about HBV are from

College  Book  Internet





Index: ..... الرقم الإشاري :

Date: ..... الموافق :

التاريخ: 21-8-2019

إحصائية لطلبة السنة الثالثة والرابعة والامتياز الدارسين  
للعام الجامعي 2019/2018 والعدد كالتالي:

عدد الكلي لطلبة السنة الثالثة 353 طالب وطالبة

عدد الإناث لطلبة السنة الثالثة 298 طالبة

عدد الذكور لطلبة السنة الثالثة 55 طالب

عدد الكلي لطلبة السنة الرابعة 296 طالب وطالبة

عدد الإناث لطلبة السنة الرابعة 243 طالبة

عدد الذكور لطلبة السنة الرابعة 53 طالب

عدد الكلي لطلبة سنة الإمتياز 230 طالب وطالبة

عدد الإناث لطلبة سنة الإمتياز 212 طالبة

عدد الذكور لطلبة سنة الإمتياز 18 طالب

والسلام عليكم

أ.معتز بالله فرج نجم

مسجل كلية طب وجراحة الفم والأسنان



مدى معرفه وموقف وممارسة طلاب كليه طب و جراحة الفم و الاسنان بجامعة  
بنغازى تجاه منع انتشار فيروس التهاب الكبد الوبائي (ب)

اعداد

ابتسام محمد مسعود بنكيه

المشرف

د.مرعي المغربي

الملخص

يعتبر التهاب الكبد الوبائي (ب) مشكلة صحية عامة عالمية، أكثر الفئات المعرضة للإصابة به ونقله هم العاملون في مجال الرعاية الصحية، خاصة من يعمل في مجال طب الأسنان وبالتحديد الطلاب وذلك بسبب نقص الخبرة السريرية. **الهدف** : تقييم معلومات ومواقف طلاب طب الأسنان في جامعه بنغازي حول التهاب الكبد الوبائي (ب). **مواد و طرائق البحث** : استخدمت الدراسة الحالية المنهج الوصفي من خلال توزيع الاستبيان الذاتي على عينة عشوائية من طلاب كلية الاسنان بجامعة بنغازي خلال العام الدراسي 2018\2019. **النتائج** : معدل الاستجابة كان 73.5% وضمت الدراسة 500 طالب 79% منهم اناث وقد أظهرت نتائج الدراسة الحالية أن معظم أفراد عينة الدراسة لديهم معلومات جيدة فيما يتعلق بالمعلومات المتعلقة بفيروس التهاب الكبد الوبائي (ب) ومعلوماتهم مقبولة فيما يخص طرق انتقال عدوي فيروس التهاب الكبد الوبائي (ب) وفيما يخص موقفهم من المرضى المصابين بفيروس التهاب الكبد الوبائي (ب) فان موقفهم ايجابي ، وممارسة الطلاب كافية تجاه منع انتشار فيروس التهاب الكبد الوبائي (ب) و93% من

الطلبة تلقوا التطعيم الخاص بفيروس التهاب الكبد الوبائي (ب). الاستنتاج : ان علي طلاب طب الأسنان في جامعة بنغازي مواصلة تحسين مستوى المعرفة، واتخاذ مواقف أكثر إيجابية من خلال تراكم الخبرة السريرية، والتثقيف المستمر حول التهاب الكبد (ب) . كذلك العمل علي دراسات شامة في المستقبل تشمل كل طلاب الطب والتمريض ليس فقط بما يتعلق بالتهاب الكبد الوبائي ولكن كل الامراض المعدية وطرق الوقاية والتعامل معها وخصوصا بعد الجائحة التي شاهدها العالم فيما يتعلق بوباء كورونا وتأثيره الاجتماعي والاقتصادي والسياسي علي العالم بأسره.



مدى معرفه وموقف وممارسة طلاب كليه طب و جراحة  
الفم و الاسنان بجامعة بنغازي تجاه منع انتشار  
فيروس التهاب الكبد الوبائي (ب)

اعداد

ابتسام محمد مسعود بنكيه

المشرف

د.مرعي المغربي

قدمت هذه الرسالة استكمالاً لمتطلبات الحصول على درجة الماجستير في طب  
الأسنان الوقائي.

جامعة بنغازي

كلية طب وجراحة الفم والاسنان

ديسمبر 2020