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Emirates University Faculty of Medicine and Health Science Community Medicine Department

الجمهورية اليمنية
وزارة التعليم العالي والبحث العلمي
الجامعة الإماراتية
كلية الطب والعلوم الصحية
قسم طب المجتمع

# Knowledge, Attitudes and Practice of Medical Students Regarding Occupational Risks of Hepatitis B Virus in College of Medicine, Emirates International University, Yemen

**A research submitted to the department of community medicine, faculty of medicine and health sciences, Emirates university, in partial fulfillment for the degree of MBBH in general medicine and surgery.**

**RESEARCH TEAM**

Anwar Saleh Alqudaimi
Abdulaziz Ali Alsha'bi
Mohammed Yahya Aldailami
Raghdah Gafar Mohammed
Amal Abdulkareem Alsanwi
Najla'a Mohammed Dahgah
Huriah Talal Al Sanwi
Entesar Ahmed Alsunidar
Yasmin Ahmed Al-Garashi

## Supervisor:

**Assis. Prof. Dr : Ahmed Hamood Al-Shahethi**
**Social and preventive Medicine**

**Faculty of Medicine 21 September University**

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## DEDICATION

To our parents for their great kindness, devotion, and continuous support. We commend their efforts and their toleration.

To our brothers, who have been our source of inspiration and gave us strength when we thought of giving up.

To our sisters, relatives, mentors, friends, and colleagues who have been always there for us every time we need.

## ACKNOWLEDGEMENT

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We would like to express our gratitude and appreciation for the role of our supervisor **Dr.Ahmed Hamood Al-Shahethi** for his insightful lectures, guidance, encouragement, patience, and valuable advice that had helped us to carry on the study successfully.

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## ABSTRACT

**Introduction:**

The practice of modern medicine has contributed lot in the increase of the cases and spreading of hepatitis B in the society. Hepatitis B infection are common due to lapse in the sterilization technique of instruments or due to the improper hospital waste management. Knowledge regarding the Hepatitis B virus and safety precautions is needed to minimize the health care settings acquired infections among health personnel.

**Objectives:**

Assessment the Knowledge, Attitudes and Practice of Medical Students Regarding Occupational Risks of Hepatitis B among medical students regarding hepatitis B infection in Emirates University, Yemen (2022).

**Methods:**

During March 2013, a descriptive cross-sectional study was conducted on medical students of International Emirates University College of Medicine. Structured questionnaires of 47 different statements concerning knowledge base of HBV, attitudes as well as practices toward occupational risks of hepatitis B were distributed to357 students. Statistical Package for Social Sciences (SPSS) version of 21 was utilized to conduct statistical analysis and examine the data at hand. Chi-square test was used implemented to determine the relationship between categorical variables.

**Results:**

Among 357 completely filled questionnaires, respondents overall gave 67.4% correct answers regarding the knowledge of HBV infection, 69.9% on its preventive aspect. Regarding attitude,

the level was 9.6% and 41.7% level of practices. However, only 32.5% participants were vaccinated for HBV before entering practicum at teaching hospitals.

Have sharp-proof containers at clinics for disposing of needles and sharp objects was (89.6%), not reusing or sharing needles/syringes was (82.7%), wash hands with soap or disinfectant after each clinical procedure was (81.1%), recap needle with two hands after use and discard immediately in a sharp-proof container was (81.1%) and hepatitis B vaccine was (76.5%).

Compared to preclinical, significantly better knowledge was found among clinical year medical students regarding the using a condom prevent HBV transmission ($p$ = 0.004), do not recap needle and discard immediately in a sharp-proof container ($p$ = 0.028), while preclinical year medical students significantly better knowledge was found regarding the pregnant women should be tested for hepatitis B ($p$ = 0.003), the hepatitis B vaccine is needing the first dose of vaccine for baby ($p$ = 0.041) and family members of those who have hepatitis B should be tested ($p$ = 0.046).

**Conclusion:**

Findings from our research emphasized an immediate need to improve the medical schools' training curriculum in Yemen to enable students' readiness in hepatitis B prevention and management. Further strategies for preventing workplace exposure, training programs on HBV infection, including post exposure prophylaxis, and increasing vaccination coverage rate of all medical students are highly recommended.

**Key words:** Hepatitis B, KAP Study, Medical students, Yemen

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# الملخص

**المقدمة:**

لقد ساهمت ممارسة الطب الحديث كثيرًا في زيادة حالات الإصابة بالتهاب الكبد الفيروسي (ب) وانتشاره في المجتمع. تعد عدوى التهاب الكبد B شائعة بسبب تقصير في تقنية تعقيم الأدوات أو بسبب الإدارة غير السليمة لنفايات المستشفى. هناك حاجة إلى المعرفة المتعلقة بفيروس التهاب الكبد B واحتياطات السلامة لتقليل العدوى المكتسبة في أماكن الرعاية الصحية بين العاملين الصحيين.

**الاهداف:**

تقييم معرفة ومواقف وممارسات طلاب الطب فيما يتعلق بالمخاطر المهنية لالتهاب الكبد ببين طلاب الطب فيما يتعلق بعدوى التهاب الكبد (ب) في جامعة الإمارات الدولية ، اليمن (٢٠٢٢).

**منهجية البحث:**

خلال مارس ٢٠١٣ ، أجريت هذه الدراسة الوصفية المقطعية على طلاب كلية الطب في جامعة الامارات الدولية ، تم توزيع استبيانات منظمة من ٤٧ عبارة مختلفة تتعلق بقاعدة المعرفة الخاصة بفيروس التهاب الكبد (ب) والمواقف وكذلك الممارسات تجاه المخاطر المهنية لالتهاب الكبد (ب) على ٣٥٧ طالبًا. تم استخدام الحزمة الإحصائية للعلوم الاجتماعية (SPSS) الاصدار ٢٥ لإجراء التحليل الإحصائي وفحص البيانات الموجودة. تم استخدام اختبار square-Chi لتحديد العلاقة بين المتغيرات الفئوية.

**النتائج:**

من بين ٣٥٧ استبيانًا ممتلئًا بالكامل ، أعطى المستجيبون بشكل عام ٦٧,٤٪ إجابات صحيحة فيما يتعلق بمعرفة عدوى فيروس التهاب الكبد (ب) ، و ٦٩,٩٪ عن الجانب الوقائي. اما بخصوص المواقف فكان المستوى ٩,٦٪ و ٤١,٧٪ مستوى الممارسات.ومع ذلك ، تم تلقيح ٣٢,٥٪ فقط من المشاركين ضد التهاب الكبد (ب) قبل دخول التدريب العملي في المستشفيات التعليمية.

كان معرفة الطلاب في وجود أوعية مانعة للاصابة في العيادات للتخلص من الإبر والأدوات الحادة (٨٩,٦٪) ، عدم إعادة استخدام أو مشاركة الإبر / الحقن كانت (٨٢,٧٪) ، غسل اليدين بالصابون أو المطهر بعد كل إجراء إكلينيكي كان (٨١,١٪) ، عدم تغليف المحاقن بعد الاستعمال والتخلص منها فوراً في عبوة واقية بلغت (٨١,١٪) ولقاح التهاب الكبد (ب) (٧٦,٥٪).

بالمقارنة مع ما قبل السريرية ، تم العثور على معرفة أفضل بشكل ملحوظ بين طلاب الطب السنة السريرية فيما يتعلق باستخدام الواقي الذكري يمنع انتقال الالتهاب الكبدي (ب) (ع = ٠,٠٠٤) ، إعادة تغليف الإبرة والتخلص منها على الفور في حاوية مخصصة لذلك (ع = ٠,٠٢٨) ، في حين تم العثور على طلاب الطب في السنة قبل السريرية معرفة أفضل بشكل ملحوظ فيما يتعلق بفحص النساء الحوامل من أجل التهاب الكبد (ب) (ع = ٠٠٣,٠) ،يحتاج الطفل الى الجرعة الاولى من لقاح التهاب الكبد (ب)(ع == ٠,٠٤١ ) ويجب اجراء اختبار أفراد عائلة المصاب بالتهاب الكبد (ب) (ع = ٠,٠٤٦ ).

**الخاتمة:**

أكدت النتائج التي توصلنا إليها في بحثنا الحاجة الفورية إلى تحسين مناهج تدريب كليات الطب في اليمن لتمكين الطلاب من الاستعداد للوقاية من التهاب الكبد (ب) وإدارته. مزيد من الاستراتيجيات لمنع التعرض في مكان العمل ، وبرامج التدريب على عدوى فيروس التهاب الكبد (ب)، بما في ذلك ما يوصى بشدة بالوقاية من التعرض وزيادة معدل تغطية التطعيم لجميع طلاب الطب.

**الكلمات الدالة:**التهاب الكبد (ب)، دراسة KAP ، طلاب الطب ، اليمن

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## List of abbreviations

| | |
|---|---|
| **EIU** | Emirates International University |
| **HBV** | Hepatitis B Virus |
| **HCC** | Hepatic Cell Carcinoma |
| **HCV** | Hepatitis C Virus |
| **SPSS** | Statistical Package for Social Science |
| **WHO** | World Health Organization |

# CHAPTER 1 : INTRODUCTION

## 1.1 Background:

Hepatitis B virus infection is a major public health problem worldwide which discovered in 1966 ; that attacks the liver and can cause both acute and chronic disease (Abdela, Woldu, Haile, Mathewos, & Deressa, 2016). The virus is most commonly transmitted from mother to child during birth and delivery, as well as through contact with blood or other body fluids during sex with an infected partner, unsafe injections or exposure to sharp instruments. Most people do not experience any symptoms when newly infected. However, some people have acute illness with symptoms that last several weeks, including yellowing of the skin and eyes (jaundice), dark urine, extreme fatigue, nausea, vomiting and abdominal pain. People with acute hepatitis can develop acute liver failure, which can lead to death. Among the long-term complications of HBV infections, a subset of persons develops advanced liver diseases such as cirrhosis and hepatocellular carcinoma, which cause high morbidity and mortality. It is not possible on clinical grounds to differentiate hepatitis B from hepatitis caused by other viral agents, hence laboratory confirmation of the diagnosis is essential. Several blood tests are available to diagnose and monitor people with hepatitis B. They can be used to distinguish acute and chronic infections. WHO recommends that all blood donations be tested for hepatitis B to ensure blood safety and avoid accidental transmission. There is no specific treatment for acute hepatitis B. Therefore, care is aimed at maintaining comfort and adequate nutritional balance, including replacement of fluids lost from vomiting and diarrhoea. Most important is the avoidance of unnecessary medications. Acetaminophen, paracetamol and medication against vomiting should be avoided.Chronic hepatitis B infection can be treated with medicines, including oral antiviral agents. Treatment can

slow the progression of cirrhosis, reduce incidence of liver cancer and improve long term survival. In 2021 WHO estimated that 12% to 25% of people with chronic hepatitis B infection will require treatment, depending on setting and eligibility criteria.(WHO, 2021) A vaccine can prevent hepatitis B, but there's no cure if you have the condition. If you're infected, taking certain precautions can help prevent spreading the virus to others.

### 1.1.1 Globally

Worldwide, WHO estimates that 296 million people were living with chronic hepatitis B infection in 2019, with 1.5 million new infections each year. In 2019, hepatitis B resulted in an estimated 820000 deaths , mostly from cirrhosis and hepatocellular carcinoma . The burden of hepatitis B infection is highest in the WHO Western Pacific Region and the WHO African Region , where 116 million and 81 million people respectively , are chronically infected . sixty million people are infected in the WHO Eastern Mediterranean Region , 18 million in the WHO south – East Asia Region , 14 million in the European Region and 5 million in the WHO Region of the Americas (WHO, 2021).

Although overall deaths from hepatitis are increasing, new infections of HBV are falling, thanks to increased coverage of HBV vaccination among children. Globally, 84% of children born in 2015 received the 3 recommended doses of hepatitis B vaccine. Between the pre-vaccine era (which, according to the year of introduction can range from the 1980s to the early 2000s) and 2015, the proportion of children under 5 years of age with new infections fell from 4.7% to 1.3%. However, an estimated 257 million people, mostly adults born before the introduction of the HBV vaccine, were living with chronic hepatitis B infection in 2015.

Hepatitis B levels vary widely across WHO regions with the WHO African Region and WHO Western Pacific Region sharing the greatest burden.

WHO Western Pacific Region: 6.2% of population (115 million people)

WHO African Region: 6.1% of population (60 million people)

WHO Eastern Mediterranean Region: 3.3% of population (21 million people)

WHO South-East Asia Region: 2% of population (39 million people)

WHO European Region: 1.6% of population (15 million people)

WHO Region of the Americas: 0.7% of population (7 million people)

There is currently no vaccine against HCV, and access to treatment for HBV and HCV is still low.

WHO's Global Health Sector Strategy on viral hepatitis aims to test 90% and treat 80% of people with HBV and HCV by 2030.

The report notes that just 9% of all HBV infections and 20% of all HCV infections were diagnosed in 2015. An even smaller fraction – 8% of those diagnosed with HBV infection (1.7 million people) were on treatment, and only 7% of those diagnosed with HCV infection (1.1 million people) had started curative treatment during that year.

HBV infection requires lifelong treatment, and WHO currently recommends the medicine tenofovir, already widely used in HIV treatment.

WHO's Global hepatitis report, 2017 demonstrates that despite challenges, some countries are taking successful steps to scale-up hepatitis services.

### 1.1.2 Regionally

Middle Eastern countries are considered developing countries that possess a suboptimal health care infra-structure. Reliable data on epidemiology may be difficult to obtain.

In such areas, assessing HBV prevalence in blood donors appears attractive because they are based on a large number of individuals. Data obtained from blood donor studies can be considered acceptable indicators of the HBV burden in developing countries provided it is understood that these prevalence data underestimate the real problem because high-risk groups for HBV are rejected from blood donation without pretransfusion blood screening for hepatitis B surface antigen (HBsAg).

For example, in Turkey, according to a large nationwide study, HBsAg prevalence among blood donors reached its peak in 1991 (5.2%), after which it gradually and consistently decreased, reaching 2.1% in 2004 . The study was based on data obtained from 22 blood donor centers dispersed throughout Turkey and contained results of blood screening of 6.24 million donors between 1989 and 2004. The 2.1% prevalence rate for 2004 was based on 305,324 blood donors. This prevalence rate needs to be compared with a population-based, cross-sectional nationwide study using sound statistical methods, such as random sampling conducted in the years 2009 to 2010.

In this study, the HBsAg prevalence rate was found to be 4.0%.6 Similarly, a meta-analysis from population-based studies estimated the HBsAg prevalence rate in the Iranian population as 3.0%, which is much higher than the 0.6% reported in blood donors.4,7 Taking these considerations into account, a recent review reported a pooled HBV prevalence rate of 1.62% in blood donors in the Middle East.

Pooled HBsAg prevalence rates among individual countries were as follows: Iran, 0.58%; Iraq, 0.67%; Saudi Arabia, 3.02%; Cyprus, 3.00%; Turkey, 1.68%; Yemen, 5.05%; Kuwait, 1.92%; Jordan, 1.72%; and Lebanon, 0.92%

Thus, the HBsAg prevalence rate in the Middle East appears to be slightly less than or greater than 2% in blood donors. Based on the considerations mentioned earlier, HBsAg prevalence in the general population should be higher, and as such, it is fair to suggest that the Middle East is currently an area consistent with lower intermediate endemicity (2.0%-4.9%) for HBsAg.

There are several barriers to diagnosis and treatment of CHB in the Middle East. Underdiagnosis is an important problem in developing countries but is also observed in industrialized countries. In a study from Germany where 21,000 outpatients were screened for HBsAg, 110 (0.5%) were found to be positive for HBsAg, and 85.0% of these individuals were unaware of their CHB status.

In developing countries, the proportion of patients with viral hepatitis who are unaware of their disease is estimated to be more than 90%.6,10 This needs to be addressed, and screening strategies must be developed.

Screening high-risk groups may not suffice, and large-scale screening is a difficult task (Akyıldız, Ahıskalı, Zeybel, & Yurdaydın, 2019)

### 1.1.3 Nationally

The ministry of public health in re-public of Yemen ranks HBV infection 12th on its list of major public health problems and the studies estimated the HBsAg prevalence rate in Yemen as 5.05% (Murat Akyıldız, 2020).

The endemicity of infection is considered high in Yemen, where prevalence of positive HBsAg ranges from 8 % to 20 %, and up to 50 % of the populations generally have serological evidence of previous HBV infection (Al-Shamahy, 2000).

There is a scarcity of data in Yemen about occupational exposure to NSIs and HBV vaccination coverage among laboratory staff].

Laboratory staff are at high risk of blood-borne viruses hepatitis because of the limited vaccination of hepatitis B virus (HBV) among health care workers, the lack of personal protective equipment, and unsafe work practices such as improper management of sharp waste

One study reported that 55% of staff had been injured during their work in the laboratory, with NSIs being the commonest injury, and only 47% of staff had been vaccinated against HBV HBV (Al-Abhar et al., 2020).

Medical lab and nursing science students, being part of the health care delivery system, are exposed to the same size of risk as other health care workers when they come in contact with patients and contaminated instruments. few studies have been conducted to find out the knowledge, attitude and practice among medical lab and nursing students about Hepatitis B and C in Yemen.

## 1.2 problem of statement

The endemicity of infection is considered high in Yemen, where prevalence of positive HBsAg ranges from 8 % to 20 %, and up to 50 % of the populations generally have serological evidence of previous HBV infection (Al-Shamahy, 2000).

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University of Sana'a, the Republic of Yemen. Confidential questionnaires were distributed to employees of the Kuwait Hospital, a large general teaching hospital in Sana'a, the capital of the Republic of Yemen, These were found to be independent predictors for the likelihood of detecting either HBsAg or anti-HBc positive status. Fifty four subjects (9.9%) were positive for HBsAg and 174 subjects (32.0%) were positive for anti-HBc (Shidrawi, Ali Al- Huraibi, Ahmad Al- Haimi, Dayton, & Murray- Lyon, 2004).

Hence, this study aims to assess the knowledge, attitude and practice of students towards hepatitis B and C transmission and prevention among medical students' in in College of Medicine, International Emirates University of Yemen.

## 1.3 Objectives:

### 1.3.1 General objective

The aim of the study to assess the knowledge, attitude and practice toward occupational risks among Emirates International University medical students, Sana'a, Yemen, 2022**.**

### 1.3.2 Specific objectives

I) To identify the level of the knowledge, attitudes and practice among medical student toward occupational risks of hepatitis B virus at Emirates International University students

2) To describe characteristics of participants (e.g. sociodemographic, mode transmission, Preventive of HBV measures, Hepatitis B vaccine, diagnosis, symptoms and treatment among medical student at Emirates International University.

3) To determine the association of knowledge, attitude and practice toward hepatitis B with stage of training students (preclinical and clinical) at Emirates International Universit

# CHAPTER 2 : LITERATURE REVIEW

## 2.1 Introduction

Hepatitis B is a potentially life-threatening liver infection caused by the hepatitis B virus (HBV). It is a major global health problem. It can cause chronic infection and puts people at high risk of death from cirrhosis and liver cancer.

A safe and effective vaccine that offers 98% to 100% protection against hepatitis B is available. Preventing hepatitis B infection averts the development of complications including chronic disease and liver cancer.

The burden of hepatitis B infection is highest in the WHO Western Pacific Region and the WHO African Region, where 116 million and 81 million people, respectively, are chronically infected. Sixty million people are infected in the WHO Eastern Mediterranean Region, 18 million in the WHO South-East Asia Region, 14 million in the WHO European Region and 5 million in the WHO Region of the Americas.

## 2.2 Transmission

In highly endemic areas, hepatitis B is most commonly spread from mother to child at birth (perinatal transmission) or through horizontal transmission (exposure to infected blood), especially from an infected child to an uninfected child during the first 5 years of life. The development of chronic infection is common in infants infected from their mothers or before the age of 5 years.

Hepatitis B is also spread by needlestick injury, tattooing, piercing and exposure to infected blood and body fluids, such as saliva and menstrual, vaginal and seminal fluids. Transmission of the virus may also occur through the reuse of contaminated needles and syringes or sharp objects either in health care settings, in the community or among persons who inject drugs. Sexual transmission is more prevalent in unvaccinated persons with multiple sexual partners.

Hepatitis B infection acquired in adulthood leads to chronic hepatitis in less than 5% of cases, whereas infection in infancy and early childhood leads to chronic hepatitis in about 95% of cases. This is the basis for strengthening and prioritizing infant and childhood vaccination.

The hepatitis B virus can survive outside the body for at least 7 days. During this time, the virus can still cause infection if it enters the body of a person who is not protected by the vaccine. The incubation period of the hepatitis B virus ranges from 30 to 180 days. The virus may be detected within 30 to 60 days after infection and can persist and develop into chronic hepatitis B, especially when transmitted in infancy or childhood.

## 2.3 Symptoms

Most people do not experience any symptoms when newly infected. However, some people have acute illness with symptoms that last several weeks, including yellowing of the skin and eyes (jaundice), dark urine, extreme fatigue, nausea, vomiting and abdominal pain. People with acute hepatitis can develop acute liver failure, which can lead to death. Among the long-term complications of HBV infections, a subset of persons develops advanced liver diseases such as cirrhosis and hepatocellular carcinoma, which cause high morbidity and mortality.

## 2.4 HBV-HIV coinfection

About 1% of persons living with HBV infection (2.7 million people) are also infected with HIV. Conversely, the global prevalence of HBV infection in HIV-infected persons is 7.4%. Since 2015, WHO has recommended treatment for everyone diagnosed with HIV infection, regardless of the stage of disease. Tenofovir, which is included in the treatment combinations recommended as first-line therapy for HIV infection, is also active against HBV.

## 2.5 Diagnosis

It is not possible on clinical grounds to differentiate hepatitis B from hepatitis caused by other viral agents, hence laboratory confirmation of the diagnosis is essential. Several blood tests are available to diagnose and monitor people with hepatitis B. They can be used to distinguish

acute and chronic infections. WHO recommends that all blood donations be tested for hepatitis B to ensure blood safety and avoid accidental transmission.

As of 2019, 30.4 million people (10.5% of all people estimated to be living with hepatitis B) were aware of their infection, while 6.6 million (22%) of the people diagnosed were on treatment. According to latest WHO estimates, the proportion of children under five years of age chronically infected with HBV dropped to just under 1% in 2019 down from around 5% in the pre-vaccine era ranging from the 1980s to the early 2000s.

## 2.6 Treatment

There is no specific treatment for acute hepatitis B. Therefore, care is aimed at maintaining comfort and adequate nutritional balance, including replacement of fluids lost from vomiting and diarrhoea. Most important is the avoidance of unnecessary medications. Acetaminophen, paracetamol and medication against vomiting should be avoided.

Chronic hepatitis B infection can be treated with medicines, including oral antiviral agents. Treatment can slow the progression of cirrhosis, reduce incidence of liver cancer and improve long term survival. In 2021 WHO estimated that 12% to 25% of people with chronic hepatitis B infection will require treatment, depending on setting and eligibility criteria.

WHO recommends the use of oral treatments (tenofovir or entecavir) as the most potent drugs to suppress hepatitis B virus. Most people who start hepatitis B treatment must continue it for life.

In low-income settings, most people with liver cancer die within months of diagnosis. In high-income countries, patient present to hospital earlier in the course of the disease, and have access to surgery and chemotherapy which can prolong life for several months to a few years. Liver transplantation is sometimes used in people with cirrhosis or liver cancer in high-income countries, with varying success.

## 2.7 Prevention

WHO recommends that all infants receive the hepatitis B vaccine as soon as possible after birth, preferably within 24 hours, followed by 2 or 3 doses of hepatitis B vaccine at least 4 weeks apart to complete the vaccination series. Protection lasts at least 20 years and is probably lifelong. WHO does not recommend booster vaccinations for persons who have completed the 3-dose vaccination schedule.

In addition to infant vaccination, WHO recommends the use of antiviral prophylaxis for the prevention of hepatitis B transmission from mother-to-child. Implementation of blood safety strategies and safer sex practices, including minimizing the number of partners and using barrier protective measures (condoms), also protect against transmission (WHO, 2021).

## 2.8 Previous studies

A study was done in Southwest Ethiopia in 2019 February to study (the Hepatitis B and C Viral Infection Prevalence, Knowledge, Attitude, Practice, and Occupational Exposure among Healthcare Workers of Jimma University Medical Center in Southwest Ethiopia)

The study revealed that the positivity of HBsAg was 2.5% (6/240; 95% CI: 0.52-4.48%) and that of anti-HCV antibody was 0.42% (1/240; 95% CI: 0.0-1.23%). Most participants had good knowledge of HBV (73.9%), HCV (60.9%), and SP (82.2%) and positive attitude towards SP (88.7%), but only 42.6% had a good practice of SP. More than half (60%) and nearly half (43%) had a history of ever exposure and exposure in the last one year before the survey, respectively. Females were at lower risk of both having ever exposure (95% CI: (0.241, 0.777)) and exposure in the last one year before the survey (95% CI: (0.297, 0.933)) compared to males.(Hebo, Gemeda, & Abdusemed, 2019)

A study was done in Saudi Arabia in 2019, titled (Current Knowledge, Attitudes, and Practice of Medical Students Regarding the Risk of Hepatitis B Virus Infection and Control Measures at Qassim University)

A total of 21%, 41%, and 8% of students expressed good knowledge, attitudes, and practice, respectively. There was no statistically significant difference between males and females on knowledge ($p = 0.089$), attitudes ($p = 0.829$), and practice ($p = 0.248$). There was a statistically significant difference between academic years on knowledge ($p = 0.0001$), attitudes ($p = 0.0001$), and practice ($p = 0.0001$). (Al Wutayd, AlRehaili, AlSafrani, Abalkhail, & AlEidi, 2019)

Also, study was conducted in Nigeria in 2017, to study (Medical and dental students' attitude and practice of prevention strategies against hepatitis B virus infection in a Nigerian university) demonstrated that over eighty percent (83.2%) of the participants had at least a dose of the HBV vaccine while 79.65% completed the three doses. 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. 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**.** (Adenlewo, Adeosun, & Fatusi, 2017)

According medical students at Northern Border University, in Kingdom of Saudi Arabia (2017), the students’ knowledge of the hepatitis B virus was found to be good . knowledge about hepatitis B infection, 81% of them knew that carriers could transmit infection, 89.5% of them knew that it could not be spread by casual contact, 80% by contact with open wound, 96.5% by contaminated blood and body fluids, 92.5% by unsterilized syringe, needle and surgical instruments and 79.5% by unsafe sex. In total, 86.5% of students knew that a vaccine could prevent HBV infection, 95% knew it had been laboratory tested, 64% knew HBV had

post exposure prophylaxis and only 55% knew that it could be cured. In all, 75.5% of students knew that HBV caused liver cancer. Regarding attitude, 23% of students said they had no concern of being infected with HBV, 86.5% agreed that HBV vaccine was safe and effective and 90% believed that following infection, control guidelines would protect them from being infected by HBV at work.

Regarding practice, only 56.5% of students had screened for HBV infection22% had had a needle prick injury but 68% would report that injury. Furthermore, 69.5% have received HBV vaccine but only 38% of them had received 3 doses (Alhowaish et al., 2017a).

According to Medical Students in College of Medicine, Aljouf University (2013). Infectious occupational risk of hepatitis B remains a challenge for medical students and the foundations of the medical institutes. Students must complete an infection control training before they start their clinical education. Response rate of 76.7% (92/120) yielded 92 questionnaires for analysis. Majority of the students surveyed 62.0% (57/92) perceived that they are at high risk of contracting and spreading HBV. The rate of this perception among students who had a history of training on universal precautions was more than that found among those who did not have (70.8% vs. 58.8%; $P < 0.01$). Most of the students surveyed 63.0% (58/92) considered vaccine is safe and more than half 52.2% (48/92) were vaccinated against HBV. There were a very strong agreement about needlestick 92.4% (85/92) and blood 87.0% (80/92) as efficient modes of HBV transmission. Seventy‐two percent of the participants did not have any knowledge about post‐exposure prophylaxis for hepatitis B. A significant relationship was found between students who had a history of training on universal precautions and knowledge about post needlestick injury ($P < 0.01$). (Al-Hazmi, 2015)

The study was coured out in Northwest Ethiopia (2015), the study found that trainees in health profession are at a very high risk of contracting HBV during their training owing to the low HBV vaccine uptake rate and high rate of accidental exposure to blood. Thus, we recommend that all students in the health profession should be vaccinated prior to their entry

into professional practices. Majority of the study participants, (>80 %) had an adequate knowledge on risk factors for HBV, its mode of transmissions, and preventions. Two hundred of 246 (83.3 %) participants had positive attitude towards following infection control guidelines, and 201 (81.7 %) respondents believe that all HCWs should take HBV vaccine. However, only 5 (2 %) students had completed the three doses schedule of HBV vaccination. Whereas, a significant number of students, 66 (26.8 %), had been exposed to blood/body fluid via needle stick injury at least once since they started their training in the health facility.(Abdela et al., 2016)

In Vietnam (Nguye et al.,2021), the research emphasized an immediate need to improve the medical schools' training curriculum in Vietnam to enable students' readiness in hepatitis B prevention and management. Among 2000 participants, 84.2% reported they had been tested for hepatitis B and 83.9% had received the hepatitis B vaccine. The mean knowledge, attitude, practice score was 40.2 out of 54 (74.4%) with only 19.9% of the study participants obtaining a good score. In multivariate analysis, fifth year students, students from central universities, students who had tested positive for hepatitis B and students who had received hepatitis B vaccine or had encountered patients with chronic hepatitis B had significantly higher knowledge score ($p < 0.05$). The study showed lack of trust in the hepatitis B vaccine safety and lack of confidence in providing counselling, testing and management of patients with chronic hepatitis B.(Nguyen et al., 2021)

The study was conducted in Ghana (2021), knowledge regarding general university students' population vaccination status remains limited in Ghana. Results showed that less than half of the participants (38.2%) have been vaccinated and (57.3%) were yet to complete full vaccination (taken the full three doses of the vaccine). Non-compulsory nature of Hepatitis B vaccination (22.7%), lack of awareness of the vaccination (22.7%), high cost of the vaccination (18.1%), no interest/motivation in the vaccination (16.5%) and availability issues (13.8%) were the common reasons cited for non-vaccination. In a multivariate logistic

regression analysis, participants who were aged 26 years or above had higher odds of taking Hepatitis B vaccination (AOR: 2.084; CI: 1.530– 2.838, p = .001). Also, non-Akans (AOR: 0.746; CI: 0.617–0.902, p = .002), urban residents (AOR: .695; CI: .578-.835, p = .001) and no social support receivers (AOR: .812; CI: .701–1.223, p = .005) had lesser odds of taking Hepatitis B vaccination. This study highlights the urgent need for continued health education on HBV infection and strategies that ensure that students are full vaccination.(Balegha, Yidana, & Abiiro, 2021)

A study was done in Yemen 2018 to study (knowledge, attitude and practice about hepatitis B and C among students of Hathrmout University , Al-Mukala city , Yemen), it found that the mean of participant's age ( 53.23 - 8.35). Majority of participants had poor knowledge and practice about hepatitis B and C and it's management . Also, the vast majority had negative attitude toward hepatitis.(Almualm, Banafa, & Al-Hanshi, 2018).

A study was done in Yemen 2000 for perceptions of Medical Sciences students towards hepatitis B virus vaccine in Sana'a City, Yemen), found that vaccination rate of 29.5%. The rate among Faculty of Medicine and Health Sciences students was 32.3%, whereas only 21.3% among the students of High Institute of Health Sciences. Students of dentistry attained the highest rate of vaccination (38.8%), while nursing students of the High Institute of Health Sciences achieved the lowest rate (17.1%). Rate of vaccination (46.6%) among female students was significantly higher than male students (22.3%) with a P-value of 0.0001. Medical assistants of the High Institute of Health Sciences scored the best (56%) in terms of knowledge, medical laboratory sciences students achieved the highest (43.6%) in attitude and dentistry students had the highest scores (35.5%) in practices. The mean knowledge of females and males was comparable, however, females achieved higher attitudes and practices. Final stage students attained better attitude scores than the pre-final and intermediate students (Al-Shamahy, 2000).

# CHAPTER 3 : METHODOLOGY

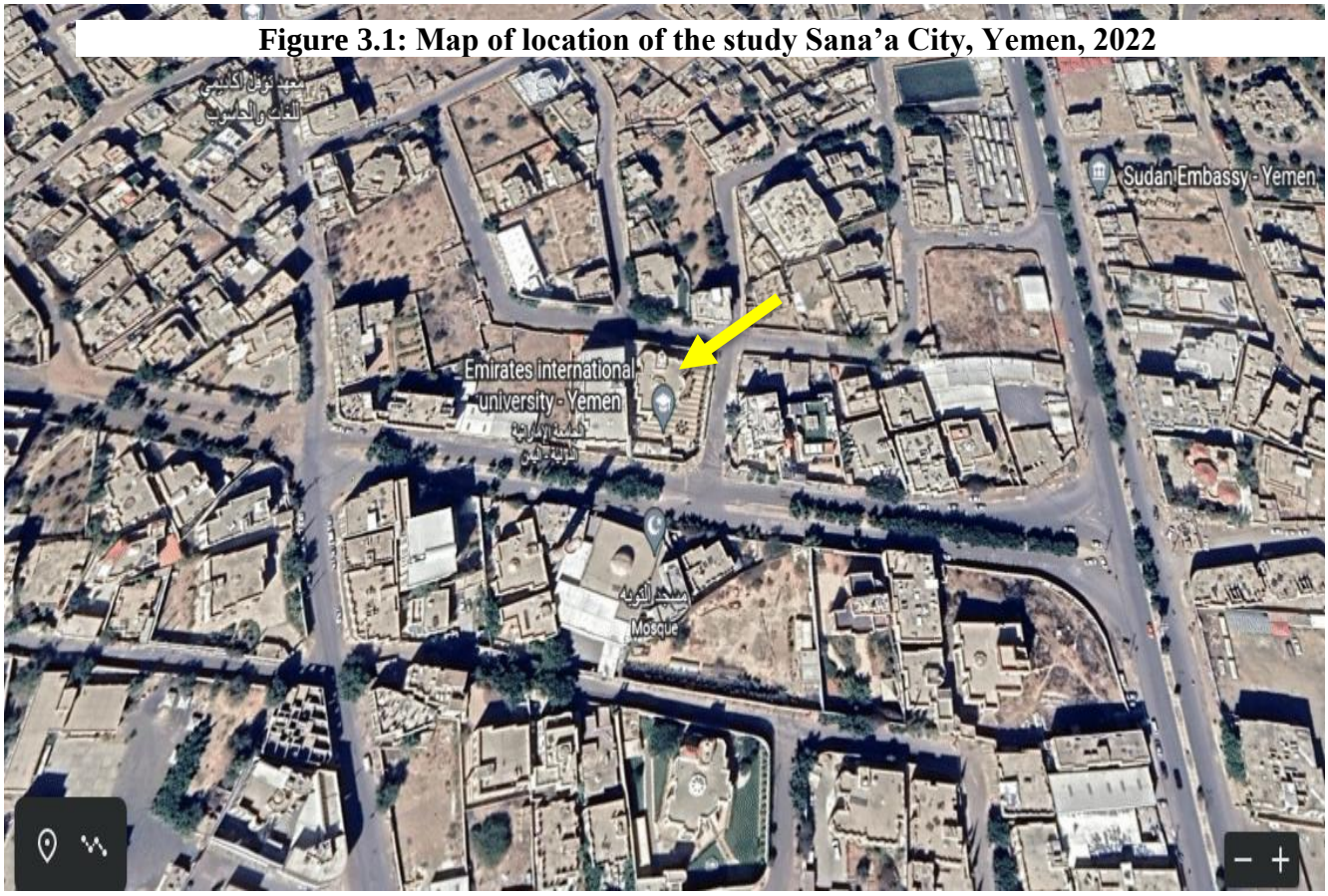
## 3.1 Study Design

A cross sectional descriptive study is carried out at Faculty of medicine and health sciences at Emirates international, Sana'a City, Yemen.

## 3.2 Setting of the Study

The study was conducted in the Faculty of Medicine and Health Sciences, Emirates international University, Sana'a, Yemen.

**Figure 3.1: Map of location of the study Sana'a City, Yemen, 2022**



The sample size was calculated using a single population proportion formula; considering 60% (Al-Abhar et al., 2020) proportion of students who have good preventive health practice towards COVID-19, 95% CI, marginal error (d) of 5% and 5% non-response rate yield 338 respondents. The final sample size was estimated to be (357) participants. The adequacy of the sample size for identifying the predictors of COVID-19-related knowledge preventive behavior was evaluated using power analysis (Figure 3.2).

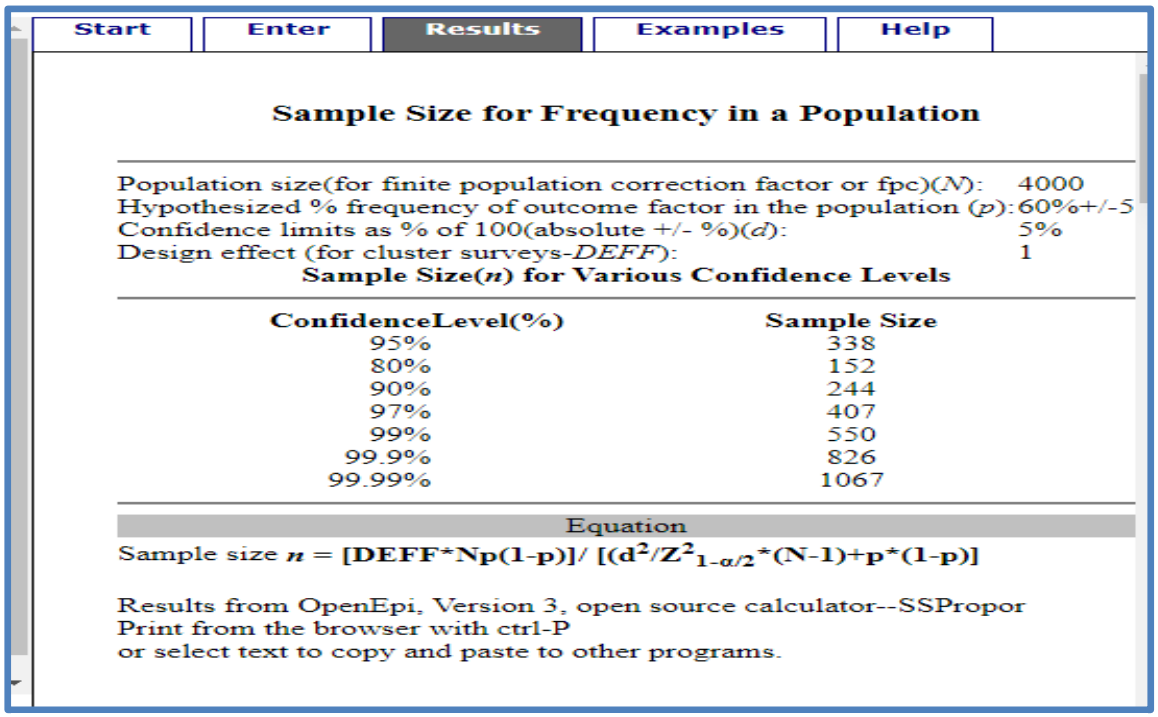



**Figure 3.2: Sample size calculation by Open Epi**

## 3.6 Sampling method

The sampling method was Stratified randomly selected academic levels after official consent was obtained from the University, calculate the number of sample from each level by using the following formula:

N= Total Study population

n= Sample size

k = Population of each faculty

$$\frac{\text{Sample size}}{\text{Total Study population}} \times \mathbf{k} = \text{sample size from each Facility}$$

## 3.7 Data collection method

The data collection procedure of this study was executed in the period from January to March, 2022. The researcher explained briefly the purpose of the study to the subjects who were willing to participate. A self-administered questionnaire was delivered. The duration of data collection of the assessment of males and female answers was about 4weeks and the time spent with each participant to answer the questionnaire sheet ranged from 30 to 45 minutes according to education level of each participant

## 3.8 Tool of the study

Data were collected by self-administrated questionnaire used for data collection:

The survey questionnaire was divided into four sections contains 38 items;

**Part1: Included demographic characteristics such as: age, gender, level of education and Marital state ,etc .**

**Part 2: Assessment of knowledge about hepatitis (mode transmission, Preventive of HBV measures, Hepatitis B vaccine, diagnosis, symptoms and treatment)**

It contains 32 items to assess the knowledge hepatitis B &C, definition, predisposing factors, signs and symptoms, and last part concern the treatment and vaccination. The knowledge questionnaire contains one type of questions; the respondents answer with either Yes or No

**Part 3: Attitudes scale toward hepatitis B**

It's composed of (7) statements to assess attitude response modified by the researcher after reviewing different related research and literature to measure attitude responses were measured using a five-point Likert scale; strongly agree, agree, neural, strongly disagree and disagree. The total mean attitude scores calculated by:

1- Positive response (strongly agree /agree) given a score of two

2. Negative response (strongly disagree/disagrees), given a score of zero

**Part 4: Assessment of practices about hepatitis B:**

It's composed from (3) items to assess the knowledge of practice about hepatitis B &C, using sterilizing instruments, hand washing, wearing gloves, and last part concern the blood analysis before blood transfusion. A score was given for each answer, with the true answer given a score of one and the false answer given a score of zero

## 3.9 Pilot study

A pilot study was carried on a sample of 20 participants excluded from the final sample of Medicine and health sciences, Medical Colleges during December 2021 in order to determine the adequacy, clarity of questions, and response of participants and estimate the length of time required to complete the questionnaire. The necessary modification was done.

## 3.10 Data analysis

Statistical analysis was conducted using frequency, Chi-square, and Fisher exact tests, with a 5% level of significance. Data analyses were performed using SPSS version 25.

## 3.11 Ethical considerations

The study's purpose, procedures, potential risks, and benefits were explained to medical students; participants were informed of the details and aims of the study before consenting to participation, and all of the information was collected and kept strictly confidential.

## 3.12 Inclusion and Exclusion criteria

### 3.12.1 Inclusion criteria

1. All medical students in the third, fourth, fifth, and sixth level
2. Attending University on the period of the survey.
3. Agree to participate in the study (oral consent from each student).

### 3.12.2 Exclusion criteria

1. All medical students in the first and second level and Other colleges of medical science (interns, nursing, dentistry)
2. The students were those who were not agree to participate in the study.
3. All students not fulfillment the above criteria

# CHAPTER 4 : RESULTS

## 4.1 Socio economic and demographic variables

This section of the study highlights the social-demographic features of the study sample. Table 4.1 shows these characteristics of the respondents. The participants were 375 students, 217 (57.9%) are males, and 158 (42.1%) are females. The age of participants ranges from 20 to 31 years with overall mean age and standard deviation of 23.87± 2.011 years. In term of age groups, the group with a majority (55.5%) of 23-25 years old with 208 respondents. The lowest frequency (3.2%) was 12 participants for the 29-31-year-old group. Students attend the University from three areas of Sana'a: 305 (81.3%) urban, 41 (10.9%) Rural, and 29 (7.7%) Suburban. Most of the respondents 125 (33.3%) were from fourth grade and 114 (30.4%) were third grade, 93 (24.8%) were fifth grade, and 43 (11.5%) were six grad in bachelor of medicine and surgery students at , the majority of them 236 (62.9%) were live with their family, 100 (26.7%) were live with alone, and 39 (10.4%) were live with their relatives, 236 (62.9%) were single, 72 (19.2%) were engaged, 63 (16.8%) were married, and 4 (1.1%) were Divorced. the mean, SD family size was 7.21±3.797, with a minimum value of one and a maximum value of twenty-eight. Most of the respondents 335 (89.3%) have 1-10 family size, the group 11-20 family size were 34 (9.1%), and 6 (1.6%) have 21-30 family size.

The family income varieties from YER 20000 to YER 3600000, which represents a mean of YER (450333.33, 343746.398). While 169 of the respondents (45.1%) have incomes of YER 300000 or below, 154 respondents (41.1%) have their incomes between YER 300001 to 600000, 27 respondents (7.2%) have their incomes between YER 601000 to 900000, 17 respondents (4.5%) have their incomes between YER 900001 to 1200000, 3 (0.8%) have their incomes between YER 1200001 to 1500000, and 5 (1.3%) have an income of over YER

1500000. 331 (88.3%) were having a family member infected with HBV, while 44 (11.7%) were no infected with HBV. 203 (54.1%) were no having a complete vaccination against hepatitis B (3 doses), 97 (25.9%) were having a complete vaccination against hepatitis B (3 doses), and 75 (20%) were not sure. The participants who were no encounter to transmission of blood were 310 (82.7%) and 65 (17.3%) were encounter to transmission of blood. The participants who were met a hepatitis B patient before 202 (53.9%), while 173 (46.1%) were not met a hepatitis B patient before.

**Table 4.1: Distribution of Socio-demographic variables among students towards the HBV**

| Variable/Factor | Frequency | Percentage |
|---|---|---|
| **Sex of student** | | |
| Male | 217 | 57.9 |
| Female | 158 | 42.1 |
| **Age of student (Years)** | | |
| 20-22 | 98 | 26.1 |
| 23-25 | 208 | 55.5 |
| 26-28 | 57 | 15.2 |
| 29-31 | 12 | 3.2 |
| Mean, SD | 23.87, 2.011 | |
| **Residence of student** | | |
| Urban | 305 | 81.3 |
| Suburban | 29 | 7.7 |
| Rural | 41 | 10.9 |
| **Grade** | | |
| Grade 3 | 114 | 30.4 |
| Grade 4 | 125 | 33.3 |
| Grade 5 | 93 | 24.8 |
| Grade 6 | 43 | 11.5 |
| **Living with** | | |
| Family | 236 | 62.9 |
| Relatives | 39 | 10.4 |
| Alone | 100 | 26.7 |
| Marital status | | |
| Married | 63 | 16.8 |
| Single | 236 | 62.9 |
| Engaged | 72 | 19.2 |
| Divorced | 4 | 1.1 |
| **Total family size** | | |
| 3-6 | 194 | 51.7 |
| 7-9 | 112 | 29.9 |
| 10-13 | 50 | 13.3 |
| >13 | 19 | 5.1 |
| Mean, SD | 7.25,3.75 | |

| | | |
|---|---|---|
| **Family monthly income (YR)** | | |
| less than 300000 | 154 | 41.1 |
| 300001-600000 | 169 | 45.1 |
| 600001-900000 | 27 | 7.2 |
| 900001-1200000 | 17 | 4.5 |
| 1200001-1500000 | 3 | 0.8 |
| more than 1500000 | 5 | 1.3 |
| Mean, SD | 450333.33, 343746.398 | |
| **Having_a_family_member_infected_with_HBV** | | |
| Yes | 44 | 11.7 |
| no | 331 | 88.3 |
| **Having a complete vaccination against hepatitis B (3 doses)** | | |
| yes | 97 | 25.9 |
| no | 203 | 54.1 |
| Not sure | 75 | 20.0 |
| **Did you encounter to transmission of blood?** | | |
| yes | 65 | 17.3 |
| no | 310 | 82.7 |
| Not sure | 65 | 17.3 |
| **Met a hepatitis B patient before** | | |
| yes | 202 | 53.9 |
| no | 173 | 46.1 |

Figure 4.1 shows the age of participants ranges from 20 to 31 years old, with a mean age equal to 23.87 and SD 2.011\

## 4.2

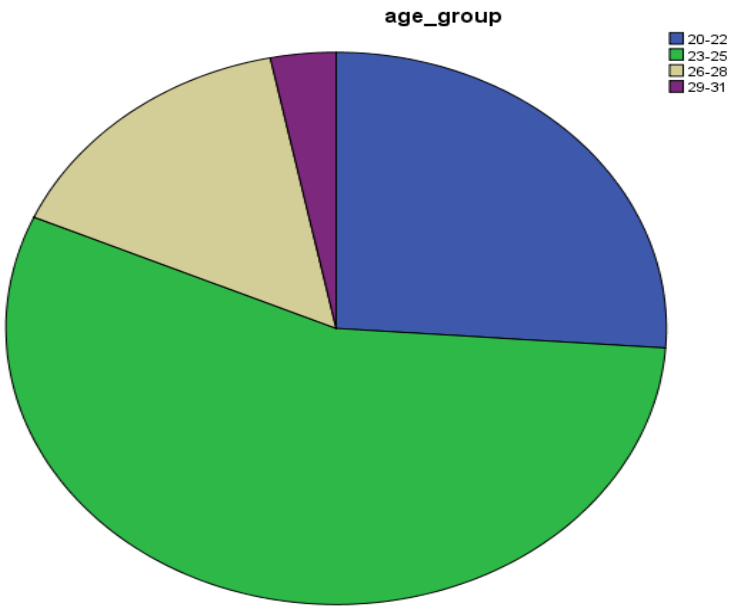



**Figure 4.1: Age Group dataset**

## Knowledge of HBV

### 4.2.1 Modes of hepatitis B transmission

Table 4.2 (a) shows these characteristics of the respondents who had no good level of knowledge on the modes of hepatitis B transmission through handshake (Needlestick injuries) 304 (81.1%), while 71 (18.9%) were a poor level of knowledge about of modes of hepatitis B transmission through handshake (Needlestick injuries). A high proportion of the respondents 321 (85.6%) who had a good level of knowledge that doctors and medical students are more prone to getting hepatitis B via cross-infection, while 54 (14.4%) were no good level of knowledge that doctors and medical students are more prone to getting hepatitis B via cross-infection, 299 (79.7%) had a good level of knowledge hepatitis B be transmitted from mother to child at birth, while 76 (20.2%) were no good level of knowledge that hepatitis B be transmitted from mother to child at birth. 207 (55.2%) had no good level of knowledge hepatitis B be transmitted through sharing food or utensils, while 168 (44.8%) were had a good level of knowledge that hepatitis B be transmitted through sharing food or utensils. 290 (77.3%) had a good level of knowledge that semen and vaginal secretions are modes of hepatitis B transmission, while 85 (22.7%) were had no good level of knowledge that semen and vaginal secretions are modes of hepatitis B transmission. 229 (70.1%) had no good level of knowledge that an infected mother may transmit HBV to her newborn baby through breast milk, while 146 (38.9%) were had a good level of knowledge that an infected mother may transmit HBV to her newborn baby through breast milk. 190 (50.7%) had a good level of knowledge that HBV could be transmitted in saliva, while 185 (49.3%) were had no good level of knowledge that HBV could be transmitted in saliva.

**Table 4.2 (a): Distribution of knowledge of Modes of hepatitis B transmission among students towards the HBV**

| Variable/Factor | Frequency | % |
|---|---|---|
| **a. Modes of hepatitis B transmission** | | |
| **Can hepatitis B be transmitted through handshake? Needlestick injuries** | | |
| True | 71 | 18.9 |
| False | 276 | 73.6 |
| Don't know | 28 | 7.5 |
| **Are doctors and medical students more prone of getting hepatitis B via cross-infection?** | | |
| True | 321 | 85.6 |
| False | 39 | 10.4 |
| Don't know | 15 | 4.0 |
| **Can hepatitis B be transmitted through from mother to child at birth?** | | |
| True | 299 | 79.7 |
| False | 38 | 10.1 |
| Don't know | 38 | 10.1 |
| **Can hepatitis B be transmitted through sharing food or utensils?** | | |
| True | 124 | 33.1 |
| False | 207 | 55.2 |
| Don't know | 44 | 11.7 |
| **Semen and vaginal secretions are modes of transmission** | | |
| True | 290 | 77.3 |
| False | 47 | 12.5 |
| Don't know | 38 | 10.2 |
| **An infected mother may transmit HBV to her new born baby through breast milk** | | |
| True | 146 | 38.9 |
| False | 156 | 41.6 |
| Don't know | 73 | 19.5 |
| **HBV could be transmitted in saliva** | | |
| True | 190 | 50.7 |
| False | 131 | 34.9 |
| Don't know | 54 | 14.4 |

### 4.2.2 Preventive of HBV measures

Table 4.3 (b) shows these characteristics of the respondents who had no good level of knowledge on the prevention of hepatitis B measures through cleaning and cooking food thoroughly to prevent HBV transmission 189 (50.4%), while 186 (49.6%) had a poor level of knowledge about of cleaning and cooking food thoroughly prevent HBV transmission. A high proportion of the respondents 287 (76.5%) had a good level of knowledge that the hepatitis B vaccine prevents HBV transmission, while 88 (23.5%) were no good level of knowledge that the hepatitis B vaccine prevents HBV transmission. 310 (82.7%) had a good level of knowledge that HBV transmission is prevented by not reusing or sharing needles/syringes, while 65 (17.4%), were no good level of knowledge that the HBV transmission be prevented by not reusing or sharing needles/syringes. 193 (51.4%) had no good level of knowledge that can HBV transmission be prevented by avoiding sharing food/utensils or eating with a person with chronic HBV, while 182 (48.6%) had a good level of knowledge that can HBV transmission be prevented by avoiding sharing food/utensils or eating with a person with chronic HBV. 252 (67.2%) had a good level of knowledge that using a condom prevents HBV transmission, while 123 (32.8%) had no good level of knowledge that using a condom prevents HBV transmission.

About the who needs the hepatitis B vaccine, 286 (76.3%) had a good level of knowledge that the hepatitis B vaccine is necessary to prevent mother-to-child transmission, while 89 (23.7%) had no good level of knowledge that the hepatitis B vaccine is necessary to prevent mother to child transmission. 280 (74.7%) had a good level of knowledge that the baby needs the hepatitis B vaccine first dose of the hepatitis B vaccine, while 95 (25.3%) had no good level of knowledge that the baby needs the first dose of the hepatitis B vaccine. 336 (89.6%) had a good level of knowledge is it necessary to have sharp-proof containers at clinics for disposing of needles and sharp objects, while 39 (10.4%) had no good level of knowledge it necessary to have sharp-proof containers at clinics for disposing of needles and sharp objects.

Students responses about prevent needle-stick injury, 304 (81.1%) had a good level of knowledge that washing hands with soap or disinfectant after each clinical procedure, while 39 (19.0%) had no good level of knowledge that washing hands with soap or disinfectant after each clinical procedure. 304 (81.1%) had a good level of knowledge that returning a needle cap with two hands after use and immediately disposing of it in a sharp-proof container prevents hepatitis B infection, while 71 (18.9%) did not have a good level of knowledge that re-cap Needle with two hands after use and dispose of immediately in a sharp-proof container prevents hepatitis B infection. 221 (58.9%) had no good level of knowledge that returning the needles cap and immediately disposing of it in a sharp's container prevented HBV infection, while 154 (41.1%) had a good knowledge of not returning the needles cap and immediately disposing of it in a sharp's container prevented HBV infection.

**Table 4.3(b): Distribution of knowledge variables among students towards the HBV**

| Variable/Factor | Frequency | % |
|---|---|---|
| **b. Preventive of HBV measures** | | |
| **Can cleaning and cooking food thoroughly prevent HBV transmission?** | | |
| True | 186 | 49.6 |
| False | 140 | 37.3 |
| Don't know | 49 | 13.1 |
| **Can the hepatitis B vaccine prevent HBV transmission?** | | |
| True | 287 | 76.5 |
| False | 56 | 14.9 |
| Don't know | 32 | 8.6 |
| **Can HBV transmission be prevented by not reusing or sharing needles/syringes?** | | |
| True | 310 | 82.7 |
| False | 34 | 9.1 |
| Don't know | 31 | 8.3 |
| **Can HBV transmission be prevented by avoid sharing food/utensils or eating with a person with chronic HBV?** | | |
| True | 182 | 48.6 |
| False | 152 | 40.5 |
| Don't know | 41 | 10.9 |
| **K13: Can using a condom prevent HBV transmission?** | | |
| True | 252 | 67.2 |
| False | 45 | 12.0 |
| Don't know | 78 | 20.8 |
| **Who needs the hepatitis B vaccine?** | | |
| **The hepatitis B vaccine is need to prevented of mother-to-child transmission** | | |
| True | 286 | 76.3 |
| False | 50 | 13.3 |
| Don't know | 39 | 10.4 |
| **The hepatitis B vaccine is needing the first dose of hepatitis B vaccine for baby** | | |
| True | 280 | 74.7 |
| False | 34 | 9.1 |
| Don't know | 61 | 16.2 |
| **Is it necessary to have sharp-proof containers at clinics for disposing of needles and sharp objects?** | | |
| True | 336 | 89.6 |
| False | 29 | 7.7 |
| Don't know | 10 | 2.7 |
| **What would you do to prevent needle-stick injury?** | | |
| **Wash hands with soap or disinfectant after each clinical procedure?** | | |
| True | 304 | 81.1 |
| False | 52 | 13.9 |
| Don't know | 19 | 5.1 |
| **Recap needle with two hands after use and discard immediately in a sharp-proof container** | | |
| True | 304 | 81.1 |
| False | 55 | 14.7 |
| Don't know | 16 | 4.2 |
| **Do not recap needle and discard immediately in a sharp-proof container** | | |
| True | 154 | 41.1 |
| False | 198 | 52.8 |
| Don't know | 23 | 6.1 |

### 4.2.3 Hepatitis B vaccine

Table 4.4 (c) shows characteristics of the respondent's hepatitis B vaccine, 252 (67.2%) had a good level of knowledge that is safe for people of all ages, while 123 (32.8%) did not have a good level of knowledge that is safe for people of all ages. 210 (60.0%) had no good level of knowledge that the duration of protection is at least 15 years and based on current scientific evidence, lifelong, while 165 (44.0%) had a good knowledge of not the duration of protection is at least 15 years and based on current scientific evidence, lifelong. 203 (54.1%) had a good level of knowledge that the complete vaccine series induces protective antibody levels in >95% of infants, children, and young adults, while 172 (45.9%) did not have a good level of knowledge that the complete vaccine series induces protective antibody levels in >95% of infants, children and young adults. 212 (56.6%) had no good level of knowledge that the hepatitis B vaccine can be given safely together with any other vaccine, and vice versa, while 163 (43.5%) had a good knowledge of not the hepatitis B vaccine can be given safely together with any other vaccine, and vice versa. 248 (66.1%) had no good level of knowledge that pregnancy is a one contraindication for use of this vaccine, while 127 (33.9%) had a good knowledge that pregnancy is one a contraindication for use of this vaccine.

**Table 4.4(c): Distribution of knowledge variables among students towards the hepatitis B vaccine**

| Variable/Factor | Frequency | Percentage |
|---|---|---|
| **c. Hepatitis B vaccine** | | |
| **Is safe for people of all ages** | | |
| True | 252 | 67.2 |
| False | 60 | 16.0 |
| Don't know | 63 | 16.8 |
| **The duration of protection is at least 15 years and based on current scientific evidence, lifelong** | | |
| True | 165 | 44.0 |
| False | 79 | 21.1 |
| Don't know | 131 | 34.9 |
| **The complete vaccine series induces protective antibody levels in >95% of infants, children and young adults** | | |
| True | 203 | 54.1 |
| False | 38 | 10.2 |
| Don't know | 134 | 35.7 |
| **Hepatitis B vaccine can be given safely together with any other vaccine, and vice versa** | | |
| True | 163 | 43.5 |
| False | 55 | 14.7 |
| Don't know | 157 | 41.9 |
| **Pregnancy is a contraindication for use of this vaccine** | | |
| True | 127 | 33.9 |
| False | 93 | 24.8 |
| Don't know | 155 | 41.3 |

### 4.2.4 Diagnosis of HBV

Table 4.5 (d) shows these characteristics of the respondents to the diagnosis of hepatitis B virus who should be tested for hepatitis B, 313 (83.5%) had a good level of knowledge that pregnant women should be tested for hepatitis B, while 61 (16.5%) had no good knowledge that, pregnant women should be tested for hepatitis B. 307 (81.9%) had a good level of knowledge that HIV-infected people should be tested for hepatitis B, while 68 (18.1%) had no good knowledge that HIV-infected people should be tested for hepatitis B. 268 (71.5%) had a good level of knowledge that Homosexual should be tested for hepatitis B, while 107 (28.5%) had no good knowledge that Homosexual should be tested for hepatitis B. 317 (84.5%) had a good level of knowledge that family members of those who have hepatitis B should be tested for hepatitis B, while 58 (15.5%) had no good knowledge that family members of those who

have hepatitis B should be tested for hepatitis B. 293 (78.1%) had a good level of knowledge when should infants born to mothers with CHB be evaluated for HBsAg status, while 82 (21.9%) had no good knowledge that when should infants born to mothers with CHB be evaluated for HBsAg status.

**Table 4.5(d): Distribution of knowledge variables among students towards the diagnosis of hepatitis virus**

| Variable/Factor | Frequency | Percentage |
|---|---|---|
| **d. Diagnosis of HBV** | | |
| Who should be tested for hepatitis B? | | |
| **Pregnant women should be tested for hepatitis B** | | |
| True | 313 | 83.5 |
| False | 28 | 7.4 |
| Don't know | 33 | 9.١ |
| **HIV-infected people should be tested for hepatitis B** | | |
| True | 307 | 81.9 |
| False | 33 | 8.8 |
| Don't know | 35 | 9.3 |
| **K28: Homosexual should be tested for hepatitis B** | | |
| True | 268 | 71.5 |
| False | 47 | 12.5 |
| Don't know | 60 | 16.0 |
| **Family members of those who have hepatitis B should be tested for hepatitis B** | | |
| True | 317 | 84.5 |
| False | 22 | 5.9 |
| Don't know | 36 | 9.6 |
| **When should infants born to mothers with CHB be evaluated for HBsAg status?** | | |
| True | 293 | 78.1 |
| False | 22 | 5.9 |
| Don't know | 60 | 16.0 |

### 4.2.5 Symptoms of HBV

Table 4.6 (e) shows these characteristics of the respondents to the symptoms and treatment of hepatitis. 256 (68.3%) had a good level of knowledge the symptom most patients with chronic hepatitis B such as, abdominal pain, while 119 (31.7%) had no good knowledge the symptom most patients with chronic hepatitis B such as, abdominal pain. 277 (73.9%) had a good level of knowledge of the symptom of most patients with chronic hepatitis B such as urine dark, while 98 (26.1%) had no good knowledge of the symptom of most patients with chronic hepatitis B such as urine dark. 196 (52.3%) had a good level of knowledge of the symptom of most patients with chronic hepatitis B such as arthralgia, while 179 (47.7%) had no good knowledge of the symptom of most patients with chronic hepatitis B such as arthralgia. 284 (75.7%) had a good level of knowledge of the symptom of most patients with chronic hepatitis B such as, loss of appetite, while 91 (24.3%) had no good knowledge of the symptom of most patients with chronic hepatitis B such as, loss appetite. 297 (79.2%) had a good level of knowledge of the symptom of most patients with chronic hepatitis B such as, nausea & vomiting, while 78 (20.8%) had no good knowledge of the symptom of most patients with chronic hepatitis B such as, nausea & vomiting. 307 (81.9%) had a good level of knowledge of the symptom of most patients with chronic hepatitis B such as, weakness, while 68 (18.1%) had no good knowledge of the symptom of most patients with chronic hepatitis B such as, weakness. 325 (86.7%) had a good level of knowledge of the symptom of most patients with chronic hepatitis B such as, jaundice of eyes, while 50 (13.3%) had no good knowledge of the symptom of most patients with chronic hepatitis B such as, jaundice of eyes. 275 (73.3%) had a good level of knowledge that there is no cure for HBV, but there are effective medications to manage and control the disease, while 100 (26.7%) they have not had good knowledge that there is no cure for HBV, but there are effective medications to manage and control the disease.

According to the treatment goals for patients with chronic hepatitis B, 275 (73.3%) had a good level of knowledge about inhibiting the replication of the hepatitis B virus, while 100 (26.7%) had no good knowledge about inhibiting the replication of the hepatitis B virus. 333 (88.8%) were had a good level of knowledge about the prevention of disease progression of the disease, particularly liver cirrhosis and liver cancer, while 42 (11.2%) had no good knowledge about the prevention of disease progression of the disease, particularly liver cirrhosis and liver cancer. 285 (76.0%) were having a good level of knowledge about the prevent mother-to-child transmission of HBV, while 90 (24.0%) had no good knowledge about the prevent mother-to-child transmission of HBV.

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**Table 4.6(e): Distribution of knowledge variables among students towards the symptoms and treatment of hepatitis**

| Variable/Factor | Frequency | Percentage |
|---|---|---|
| **E. Symptoms of HBV** | | |
| **What symptoms are present in most patients with hepatitis B?** | | |
| **What is the symptom most patients with chronic hepatitis B Abdominal Pain?** | | |
| True | 256 | 68.3 |
| False | 51 | 13.6 |
| Don't know | 68 | 18.1 |
| **What is the symptom most patients with chronic hepatitis B Urine dark** | | |
| True | 277 | 73.9 |
| False | 36 | 9.6 |
| Don't know | 62 | 16.5 |
| **What is the symptom most patients with chronic hepatitis B arthralgia** | | |
| True | 196 | 52.3 |
| False | 73 | 19.5 |
| Don't know | 106 | 28.2 |
| **What is the symptom most patients with chronic hepatitis B loss appetite** | | |
| True | 284 | 75.7 |
| False | 45 | 12.0 |
| Don't know | 46 | 12.3 |
| **What is the symptom most patients with chronic hepatitis B nausea and vomiting** | | |
| True | 297 | 79.2 |
| False | 24 | 6.4 |
| Don't know | 54 | 14.4 |
| **What is the symptom most patients with chronic hepatitis B weakness** | | |
| True | 307 | 81.9 |
| False | 28 | 7.5 |
| Don't know | 40 | 10.6 |
| **What is the symptom most patients with chronic hepatitis B jaundice of eyes** | | |
| True | 325 | 86.7 |
| False | 22 | 5.8 |
| Don't know | 28 | 7.5 |
| **Treatment of HBV** | | |
| **There is no cure, but there are effective medications to manage and control the disease** | | |
| True | 275 | 73.3 |
| False | 56 | 14.9 |
| Don't know | 44 | 11.8 |
| **What are the treatment goals for patients with chronic hepatitis B?** | | |
| **Inhibit the replication of the hepatitis B virus** | | |
| True | 275 | 73.3 |
| False | 49 | 13.1 |
| Don't know | 51 | 13.6 |
| **Prevent disease progression of disease, particularly liver cirrhosis and liver cancer** | | |
| True | 333 | 88.8 |
| False | 21 | 5.6 |
| Don't know | 21 | 5.6 |
| **Prevent mother-to-child transmission (MTCT)** | | |
| True | 285 | 76.0 |
| False | 50 | 13.3 |
| Don't know | 40 | 10.7 |

## 4.3 Attitudes towards the HBV

Respondent's attitudes toward hepatitis B. Table 4.7 shows that 339 (90.4%) respondents strongly disagreed and disagreed with their confidence in counselling patients about hepatitis B prevention, 14 (3.7%) were neutral, 107 (28.5%) agreed and strong agreement with mean, SD 1.54 ± 0.870.

Three-hundred and two (80.5%) respondents strongly disagreed and disagreed with their thinking that the hepatitis B vaccine is safe, 49 (13.1%) were neutral, 24 (6.4%) agreed and strong agreement with mean, SD 1.81 ± 0.947.

306 (81.6%) respondents strongly disagreed and disagreed with their thinking it is necessary to vaccinate newborns for hepatitis B at birth, 50 (13.3%) were neutral, 19 (5.1%) agreed and strong agreement with mean, SD 1.73 ± 0.931.

329 (87.7%) respondents strongly disagreed and disagreed with their thinking confidence in ordering laboratory tests to monitor CHB patients, 26 (6.9%) were neutral, and 20 (5.3%) were agreed and strong agreement with mean, SD 1.60 ± 0.884.

251 (66.9%) respondents strongly disagreed and disagreed with their thinking confidence in prescribing treatment for a patient with chronic hepatitis B, 72 (19.6%) were neutral, and 52 (13.8%) were agreed and strong agreement with mean, SD 2.13 ± 1.120.

226 (60.3%) respondents strongly disagreed and disagreed where, were had their concerns having casual contact or working together with a chronic HBV patient in the same office, 54 (14.4%) were neutral, and 95 (25.3%) agreed and strongly agreed that about their concerns having casual contact or working together with a chronic HBV patient in the same office with mean, SD 2.40 ± 1.314.

229 (70.0%) respondents strongly disagreed and disagreed, where had concerns about sharing food or utensils with the CHB, while 53 (14.1%) were neutral, and 93 (24.8%) agreed and strongly agreed that they have not had concerns about sharing food or utensils with a CHB with mean, SD 2.43 ± 1.334.

**Table 4.7: Distribution of Attitudes variables among students towards the HBV**

| Variable/Factor | Strongly agree | | Agree | | Neural | | Disagree | | Strongly disagree | | Mean | SD | Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % | | | |
| Are you confident in counseling patients about prevention of HBV? | 5 | 1.3 | 17 | 4.5 | 14 | 3.7 | 102 | 27.2 | 237 | 63.2 | 1.54 | 0.870 | **7** |
| Do you think that the hepatitis B vaccine is safe? | 6 | 1.6 | 18 | 4.8 | 49 | 13.1 | 128 | 34.1 | 174 | 46.4 | 1.81 | 0.947 | **4** |
| Do you think it is necessary to vaccinate newborns for hepatitis B at birth? | 6 | 1.6 | 13 | 3.5 | 50 | 13.3 | 110 | 29.3 | 196 | 52.3 | 1.73 | 0.931 | **5** |
| Are you confident in ordering laboratory tests to monitor CHB patients? | 5 | 1.3 | 15 | 4.0 | 26 | 6.9 | 108 | 28.8 | 221 | 58.9 | 1.60 | 0.884 | **6** |
| Are you confident in prescribing treatment for a patient with chronic hepatitis B? | 11 | 2.9 | 41 | 10.9 | 72 | 19.6 | 111 | 29.6 | 140 | 37.3 | 2.13 | 1.120 | **3** |
| Would you have any concerns having casual contact or working together with a chronic HBV patient in the same office? | 30 | 8.0 | 65 | 17.3 | 54 | 14.4 | 103 | 27.5 | 123 | 32.8 | 2.40 | 1.314 | **2** |
| Would you have any concerns sharing food or utensils with a CHB? | 39 | 10.4 | 54 | 14.4 | 53 | 14.1 | 113 | 30.1 | 116 | 30.9 | 2.43 | 1.334 | **1** |

## 4.4 Prevention Practices

Table 4.8 shows characteristics of the respondents' level of knowledge on the prevention of practices HBV. 253 (67.5%) were have not of respondents did get the hepatitis B vaccine before entering practicum at teaching hospitals, while 30 (8.4) had did get the hepatitis B vaccine before entering practicum at teaching hospitals. A high proportion of the respondents 251 (66.5%) were not get tested for HBV before entering practicum at teaching hospitals, while 124 (33.1%) were get tested for HBV before entering practicum at teaching hospitals. 201 (53.6%) were consistently wear gloves when administrating injections or performing medical procedures to patients, while 174 (46.4%) did not consistently wear gloves when administrating injections or performing medical procedures to patients.

**Table 4.8 Distribution of practices variables among students of the HBV**

| Variable/Factor | n | Percentage |
|---|---|---|
| **P1: Did you get the hepatitis B vaccine before entering practicum at teaching hospitals?** | | |
| True | 122 | 32.5 |
| False | 253 | 67.5 |
| **P2: Did you get tested for HBV before entering practicum at teaching hospitals?** | | |
| True | 124 | 33.1 |
| False | 251 | 66.9 |
| **P3: Do you consistently wear gloves when administrating injections or performing medical procedures to patients?** | | |
| True | 201 | 53.6 |
| False | 174 | 46.4 |

## 4.5 Bivariate analysis

Table 4.9 shows students' correct answer rates on knowledge about HBV distributed by their training stage (clinical and pre-clinical). Overall, only 19.0% (71/375) of the answers were correct. HBV is transmitted through handshake? Needle stick injuries, and hepatitis B is transmitted through sharing food or utensils 33.1% (124/375).

On the bases of their stage of training, students in the preclinical stage have better knowledge than students studying in the clinical stage regarding an infected mother may transmit HBV to her new born baby through breast milk (P=0.001).

**Table 4.9: Knowledge of students of mode transmission towards the HBV**

| Question item(correct answer) | Correct (n= (%) | Stage of training | | P | $X^2$ |
|---|---|---|---|---|---|
| | | Preclinical* n=114 (%) | Clinical ^ n=261 (%) | | |
| Can hepatitis B be transmitted through handshake? Needlestick injuries | 71 (18.9) | 18 (15.8) | 53 (20.3) | 0.553 | 1.19 |
| Are doctors and medical students more prone of getting hepatitis B via cross-infection? | 321 (85.6) | 98 (86.0) | 223 (85.4) | 0.927 | 0.15 |
| Can hepatitis B be transmitted through from mother to child at birth? | 299 (79.7) | 95 (83.3) | 204 (78.2) | 0.392 | 1.87 |

| | | | | | |
|---|---|---|---|---|---|
| Can hepatitis B be transmitted through sharing food or utensils? | 124 (33.1) | 37 (32.5) | 87 (33.3) | 0.852 | 0.32 |
| Semen and vaginal secretions are modes of transmission | 290 (77.3) | 96 (84.2) | 194 (74.3) | 0.071 | 5.28 |
| An infected mother may transmit HBV to her new born baby through breast milk | 146 (38.9) | 60 (52.6) | 86 (33.0) | **0.001** | 13.23 |
| HBV could be transmitted in saliva | 190 (50.7) | 51 (44.7) | 139 (53.3) | 0.313 | 2.32 |
| **Preclinical*-** Grade third; **Clinical ^-** Grade fourth, fifth and sixth | | | | | |

Students' responses on different aspects of measures that might help to prevent hepatitis B transmission are shown in Table 4.10. Is it necessary to have sharp-proof containers at clinics for disposing of needles and sharp objects ranked first suggested by majority of the participants 89.6% (336/375); followed by by not reusing or sharing needles/syringes among 82.7% (310/375).

On the bases of their stage of training, students in the clinical stage have better knowledge (53.6% (140/261) than students studying in the preclinical 40.4%(46/114) stage regarding cleaning and cooking food thoroughly prevent HBV transmission (P=0.001), HBV transmission be prevented by avoid sharing food/utensils or eating with a person with chronic HBV (P=0.041) and using a condom prevent HBV transmission (P<**0.001**).

In addition, students in the preclinical stage have better knowledge (80.7% (92/114) than students studying in the clinical 72.0%(188/261) stage regarding the hepatitis B vaccine is needing the first dose of hepatitis B vaccine for baby (P=0.041) while students in the clinical stage have better knowledge (45.2% (118/261) than students studying in the preclinical

31.6%(36/114) stage regarding do not recap needle and discard immediately in a sharp-proof container (P=0.028)

**Table 4.10: Knowledge of students of prevention towards the HBV**

| Question item(correct answer) | Correct (n= (%) | Stage of training | | p | $X^2$ |
|---|---|---|---|---|---|
| | | Preclinical n=114 (%) | Clinical n=261 (%) | | |
| Can cleaning and cooking food thoroughly prevent HBV transmission? | 186 (49.6) | 46 (40.4) | 140 (53.6) | **0.001** | 13.19 |
| Can the hepatitis B vaccine prevent HBV transmission? | 287 (76.5) | 98 (78.1) | 198 (75.9) | 0.816 | 0.41 |
| Can HBV transmission be prevented by not reusing or sharing needles/syringes? | 310 (82.7) | 102 (89.5) | 208 (79.7) | 0.066 | 5.45 |
| Can HBV transmission be prevented by avoid sharing food/utensils or eating with a person with chronic HBV? | 182 (48.6) | 48 (42.1) | 134 (51.3) | **0.041** | 6.40 |
| Can using a condom prevent HBV transmission? | 252 (67.2) | 70 (61.4) | 182 (69.7) | **<0.001** | 19.38 |
| Who needs the hepatitis B vaccine? | | | | | |
| The hepatitis B vaccine is need to prevented of mother-to-child transmission | 286 (76.3) | 94 (82.5) | 192 (73.6) | 0.103 | 4.55 |
| The hepatitis B vaccine is needing the first dose of hepatitis B vaccine for baby | 280 (74.7) | 92 (80.7) | 188 (72.0) | **0.041** | 6.40 |
| Is it necessary to have sharp-proof containers at clinics for disposing of needles and sharp objects? | 336 (89.6) | 107 (93.9) | 229 (87.7) | 0.200 | 3.22 |
| What would you do to prevent needle-stick injury? | | | | | |
| Wash hands with soap or disinfectant after each clinical procedure? | 304 (81.1) | 91 (79.8) | 213 (81.6) | 0.917 | 0.17 |
| Recap needle with two hands after use and discard immediately in a sharp-proof container | 304 (81.1) | 93 (81.6) | 211 (80.8) | 0.129 | 4.10 |
| Do not recap needle and discard immediately in a sharp-proof container | 154 (41.1) | 36 (31.6) | 118 (45.2) | **0.028** | 7.12 |

Whereas vaccination considered by 67.2% (252/375) in table 4.11. There were no statistical significant differences found between the students' responses on different aspects of vaccine that might help to prevent hepatitis B transmission and their clinical stages ($P > 0.05$).

**Table 4.11: Distribution of knowledge of vaccine among students towards the hepatitis B vaccine**

| | **n** | **Stage of training** | | | |
|---|---|---|---|---|---|
| **Question item(correct answer)** | Correct (n= (%) | Preclinical n=114 (%) | Clinical n=261 (%) | **P** | **$X^2$** |
| Is safe for people of all ages | 252 (67.2) | 71 (62.3) | 181 (69.3) | 0.375 | 1.96 |
| The duration of protection is at least 15 years and based on current scientific evidence, lifelong | 165 (44.0) | 46 (40.4) | 119 (45.6) | 0.144 | 3.87 |
| The complete vaccine series induces protective antibody levels in >95% of infants, children and young adults | 203 (54.1) | 58 (50.9) | 145 (55.6) | 0.070 | 5.31 |
| Hepatitis B vaccine can be given safely together with any other vaccine, and vice versa | 163 (43.5) | 48 (42.1) | 115 (44.1) | 0.351 | 2.10 |
| Pregnancy is a contraindication for use of this vaccine | 127 (33.9) | 33 (28.9) | 94 (36.0) | 0.328 | 2.23 |

Regarding the diagnostic for Hepatitis B (Table 4.12), 83.5% (313/375) reported the pregnant women should be tested for hepatitis B and found the better knowledge of diagnosis for Hepatitis B among preclinical stage students

**Table 4.12: Knowledge of students of diagnostic towards the HBV**

| **Question item(correct answer)** | **n** Correct (n=375 (%) | **Stage of training** | | **P** | **$X^2$** |
|---|---|---|---|---|---|
| | | Preclinical n=114 (%) | Clinical n=261 (%) | | |
| Pregnant women should be tested for hepatitis B | 313 (83.5) | 99 (86.8) | 214 (82.0) | **0.003** | 11.62 |
| HIV infected people should be tested for hepatitis B | 307 (81.9) | 96 (84.2) | 211 (80.8) | 0.362 | 2.03 |
| Homosexual should be tested for hepatitis B | 268 (71.5) | 80 (70.2) | 188 (72.0) | 0.845 | 0.34 |
| Family members of those who have hepatitis B should be tested | 317 (84.5) | 104 (91.2) | 213 (81.6) | **0.046** | 6.16 |
| When should infants born to mothers with_CHB_be_evaluated | 293 (78.1) | 92 (80.7) | 201 (77.0) | 0.728 | 0.64 |

Table 4.13 shows that Students' responses on different aspects of treatment toward HBV. Majority of the students surveyed 94.1% (353/375); believed that treatment is prevent disease progression of disease particularly liver cirrhosis. Two hundred-five 76.0% suggested that, treatment the hepatic B is prevent mother to child transmission (MTCT).

**Table 4.13: Knowledge of students of treatment towards the HBV**

| Question item(correct answer) | Correct (n= (%) | Stage of training | | P | $X^2$ |
|---|---|---|---|---|---|
| | | Preclinical n=114 (%) | Clinical n=261 (%) | | |
| There is no cure but there are effective medications to_mangement. | 275 (73.3) | 85 (74.6) | 190 (72.8) | 0.343 | 2.14 |
| Inhibit the replication of the hepatitis B virus | 275 (73.3) | 91 (79.8) | 184 (70.5) | 0.085 | 4.94 |
| Prevent disease progression of disease particularly liver cirrhosis | 353 (94.1) | 109 (95.6) | 244 (93.5) | 0.636 | 0.91 |
| Prevent mother to child transmission MTCT | 285 (76.0) | 94 (82.5) | 191 (73.2) | 0.096 | 4.69 |

# CHAPTER 5 : DISCUSSION

## 5.1 Brief overview of research

The current study was conducted to identify level of knowledge, attitude and practice toward hepatitis B and associated risk factors. In order to address these research objectives, we conducted a descriptive cross-sectional study of medical student.

This study was carried out at Emirates International University, Sana'a, Yemen. Stratified sampling method was applied to select the respondents for this study. The selected students interviewed by using structured questionnaire.

This section of the study highlights the social-demographic features of the study sample. Table 4.1 shows these characteristics of the respondents. The participants were 375 students, 217 (57.9%) are males, and 158 (42.1%) are females. The age of participants ranges from 20 to 31 years with overall mean age and standard deviation of 23.87± 2.011 years. In term of age groups, the group with a majority (55.5%) of 23-25 years old with 208 respondents. The lowest frequency (3.2%) was 12 participants for the 29-31-year-old group. Students attend the University from three areas of Sana'a: 305 (81.3%) urban, 41 (10.9%) Rural, and 29 (7.7%) Suburban. Most of the respondents 125 (33.3%) were from fourth grade and 114 (30.4%) were third grade, 93 (24.8%) were fifth grade, and 43 (11.5%) were six grad in bachelor of medicine and surgery students at , the majority of them 236 (62.9%) were live with their family, 100 (26.7%) were live with alone, and 39 (10.4%) were live with their relatives, 236 (62.9%) were single, 72 (19.2%) were engaged, 63 (16.8%) were married, and 4 (1.1%) were Divorced. the mean, SD family size was 7.21±3.797, with a minimum value of one and a maximum value of twenty-eight. Most of the respondents 335 (89.3%) have 1-10 family size, the group 11-20 family size were 34 (9.1%), and 6 (1.6%) have 21-30 family size.

## 5.2 The knowledge of the students about HBV

In this study, the overall good level of knowledge regarding HBV among medical students was positive (67,4 %). This finding was lower than studies conducted study was done in Southwest Ethiopia about the Hepatitis B HBV (73.9%) (Hebo et al., 2019), in Nepal was (87%)(Shah et al., 2016) and in Yemen 2018 was poor knowledge about hepatitis B (Almualm et al., 2018). to The differences in level of knowledge have been subjected values-variation in the cut i.e. most of the previous studies had been used more than 70.65 % to say very good knowledge categorized study to %٦٠while this study has been used participants with a good level of knowledge. In addition, the discrepancies might be due to differences in sample size and study settings. In this study, medical students in the age group (i.e. 23-25 years) were more knowledgeable (55.5%) regarding HBV compared to those who were above 26 and 29 years old (41.3 % ,3.2%) .This finding is higher than the previous study that done in Hathrmout University , Al-Mukala city , Yemen (Almualm et al., 2018). Hence, students in the age group (23-25) years old are more knowledgeable compared to those who has the age above ( 25) years old .This study showed that students who living in urban had (81%) more likely to have good knowledge of HBV than to those who living in suburban and rural .This could be justified by students from urban is easy to get information from the education people and News . In bivariate analysis found that On the bases of their stage of training, students in the preclinical stage have better knowledge than students studying in the clinical stage regarding an infected mother may transmit HBV to her new born baby through breast milk (P=0.001).

**The attitude of students towards HBV:**

This study revealed that of study participants had a negative 90.4% attitude towards the prevention and control measures of HBV. This finding was higher than study conducted in Southwest Ethiopia (83.3%) (Abdela et al., 2016), in Saudi Arabia in 2019 February (8%), in

Nigeria (83.2%) (Adenlewo et al., 2017), in Yemen the vast majority had negative attitude toward hepatitis (Almualm et al., 2018) .

The current study reported that 80.5% agreed that HBV vaccine was safe. Similar study conducted in Iran found that 86.5% of students knew that vaccine could prevent HBV infection (Alhowaish et al., 2017b).

This study revealed that 81.6% of respondents agreed with necessary to introduce vaccinate newborns for hepatitis B at birth.

In contrary, study in Vietnam presents that The study showed lack of trust in the hepatitis B vaccine safety and lack of confidence in providing counselling, testing and management of patients with chronic hepatitis B (Nguyen et al., 2021).

Our results show that (66.9%) respondents agreed to prescribing treatment for a patient with chronic hepatitis B.

**Practices of the students toward HBV:**

This study revealed that (41.7%) of medical students had a good knowledge level of prevention practice regarding HBV. This finding was lower than studies conducted in Southwest Ethiopia was (42.6%), (Hebo et al., 2019), in Nigeria was (74.1%) .

This study revealed that (67.5%) were have not of respondents did get the hepatitis B vaccine before entering practicum at teaching hospitals, while (32.5%) had did get the hepatitis B vaccine before entering practicum at teaching hospitals. This was finding lower than studies in southwest Ethiopia in 2019 February ( 42.6%)[ 9] which was also good . A high proportion of the respondents 251 (66.9%) were not get tested for HBV before entering practicum at teaching hospitals, while 124 (33.1%) were get tested for HBV before entering practicum at teaching hospitals.

on the other hand, in previous study in Kingdom of Saudi Arabia reported that 69.5% have received HBV vaccine (Alhowaish et al., 2017b).

The students in the preclinical stage have better than students studying in the clinical stage regarding an infected mother may transmit HBV to her new born baby through breast milk (P=0.001). This was lower among students of Hathrmout University , Al-Mukala city , Yemen) (Almualm et al., 2018). In addition, students in the preclinical stage have better knowledge (80.7% (92/114) than students studying in the clinical 72.0%(188/261) stage regarding the hepatitis B vaccine is needing the first dose of hepatitis B vaccine for baby (P=0.041) while students in the clinical stage have better knowledge (45.2% (118/261) than students studying in the preclinical 31.6%(36/114) stage regarding do not recap needle and discard immediately in a sharp-proof container (P=0.028).

## 5.3 Conclusion

Infectious occupational risk of hepatitis B remains a challenge for medical students and the foundations of the medical institutes. Students must complete an infection control training before they start their clinical education**.** The students had good knowledge regarding HBV infection and its preventive aspect. All students should be mandatorily vaccinated before attending the clinical years.

The study revealed a low level of HBV vaccination coverage rate and a high rate of recap needle with two hands after use and discard immediately in a sharp-proof container.

The attitude of medical students toward HBV was good and showed that most of the students in clinical levels was slightly warried about HBV disease where the most of the students mentioned that they hadn't vaccine yet and that’s why they were worry about infection of HBV. There was no significant difference among both male and female in the knowledge while there was a little difference in grade level in the knowledge toward HBV.

## 5.4 Limitation of the study

Despite the study has its strengths, there are also several limitations that should be addressed.

First, this study was requiring a personal interview with each student inside the college in order to clarify all the questions of the questionnaire, although we encountered the need to obtain a permit for approval and permission from the Education Office, and also we required much more days because of difficulty of finding whole student in college at same day. Moreover, the study also shares the limitations of a cross-sectional study design.

This study was conducted among Sana'a capital city exclusively in EI university and was not inclusive of other governorates or universities. Therefore, generalization of the findings to all governorates is a little bit difficult. Furthermore, this study was also limited to the four medical levels out of too many other levels in medical college due to limited time. Hence, the findings might not provide adequate representation for all Sana'a universities.

## 5.5 Recommendations

Prevention programs about HBV should be instituted and the existing ones must be strengthened, and health education settings should be more specific and clear for the public and students. Adequate commitment from the Ministry of Health is also advocated. Further strategies for preventing workplace exposure, training programs on HBV infection, including PEP, and increasing vaccination coverage rate of all HCWS are highly recommended.

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## APPENDIX 1: Questionars of the study

## Knowledge, attitude and practices of medical students regarding occupational risks of hepatitis B virus in international Emirates university, Yemen (2022)

| Section 1: Characteristics of Study Participants | Answer |
|---|---|
| **Age of student (Years)** | …… |
| **Gender** | |
| Male | |
| Female | |
| **Residence** | |
| Urban | |
| Suburban | |
| Rural | |
| **Grade** | |
| Grade 3 | |
| Grade 4 | |
| Grade 5 | |
| Grade 6 | |
| **Living with** | |
| Family | |
| Relatives | |
| Alone | |
| **Marital status** | |
| Married | |
| Single | |
| Engaged | |
| **Total family size** | …… |
| **Family monthly income (YR)** | …… |
| **Having a family member infected with HBV** | |
| Yes | |
| No | |
| **Having a complete vaccination against hepatitis B (3 doses)** | |
| Yes | |
| No | |
| Not sure | |
| **Did you encouter to transmission of blood?** | |
| Yes | |
| No | |
| **Met a hepatitis B patient before** | |
| Yes | |
| No | |

| Section 2: Knowledge of hepatiis B viruse | |
|---|---|
| **A.Modes of hepatitis B transmission** | |
| K1:Can hepatitis B be transmitted through handshake?<br>Needlestick injuries | ☐ True ☐ False ☐ Don't know |
| K2: Are doctors and medical students more prone of getting hepatitis B via cross-infection? | ☐ True ☐ False ☐ Don't know |
| K3: Can hepatitis B be transmitted through from mother to child at birth? | ☐ True ☐ False ☐ Don't know |
| K4: Can hepatitis B be transmitted through sharing food or utensils? | ☐ True ☐ False ☐ Don't know |
| K5: Semen and vaginal secretions are modes of transmission | ☐ True ☐ False ☐ Don't know |
| K6:Infected mothers during delivery to their infants | ☐ True ☐ False ☐ Don't know |
| K7: An infected mother may transmit HBV to her new born baby through breast milk | ☐ True ☐ False ☐ Don't know |
| K8: HBV could be transmitted in saliva | ☐ True ☐ False ☐ Don't know |
| **B. Preventive measures** | |
| K9: Can cleaning and cooking food thoroughly prevent HBV transmission? | ☐ True ☐ False ☐ Don't know |
| K10: Can the hepatitis B vaccine prevent HBV transmission? | ☐ True ☐ False ☐ Don't know |
| K11: Can HBV transmission be prevented by not reusing or sharing needles/syringes? | ☐ True ☐ False ☐ Don't know |
| K12: Can HBV transmission be prevented by avoid sharing food/utensils or eating with a person with chronic HBV? | ☐ True ☐ False ☐ Don't know |
| K13: Can using a condom prevent HBV transmission? | ☐ True ☐ False ☐ Don't know |
| K14: Who needs the hepatitis B vaccine? | ☐ True ☐ False ☐ Don't know |

| | |
|---|---|
| K15: The hepatitis B vaccine is need to prevente of mother-to-child transmission | ☐ True ☐ False ☐ Don't know |
| K16: The hepatitis B vaccine is need the first dose of hepatitis B vaccine for baby | ☐ True ☐ False ☐ Don't know |
| K17: Is it necessary to have sharp-proof containers at clinics for disposing of needles and sharp objects? | ☐ True ☐ False ☐ Don't know |
| **What would you do to prevent needle-stick injury?** | |
| K18: Wash hands with soap or disinfectant after each clinical procedure? | ☐ True ☐ False ☐ Don't know |
| K19: Recap needle with two hands after use and discard immediately in a sharp-proof container | ☐ True ☐ False ☐ Don't know |
| K20: Do not recap needle and discard immediately in a sharp-proof container | ☐ True ☐ False ☐ Don't know |
| **C.Hepatitis B vaccine** | |
| K21: Is safe for people of all ages | ☐ True ☐ False ☐ Don't know |
| K22:The duration of protection is at least 15 years and based on current scientific evidence, lifelong | ☐ True ☐ False ☐ Don't know |
| K23: The complete vaccine series induces protective antibody levels in >95% of infants, children and young adults | ☐ True ☐ False ☐ Don't know |
| K24: Hepatitis B vaccine can be given safely together with any other vaccine, and vice versa | ☐ True ☐ False ☐ Don't know |
| K25: Pregnancy is a contraindication for use of this vaccine | ☐ True ☐ False ☐ Don't know |

| | |
|---|---|
| **D. Diagnosis and Treatment** | |
| Who should be tested for hepatitis B? | |
| K26: Pregnant women should be tested for hepatitis B | ☐ True ☐ False ☐ Don't know |
| K27: HIV-infected people should be tested for hepatitis B | ☐ True ☐ False ☐ Don't know |
| K28: Homosexual should be tested for hepatitis B | ☐ True ☐ False ☐ Don't know |
| K29: Family members of those who have hepatitis B should be tested for hepatitis B | ☐ True ☐ False ☐ Don't know |
| K30: What is the symptom most patients with chronic hepatitis B present? | ☐ True ☐ False ☐ Don't know |
| K31: What are the criteria for indicating treatment in patients with CHB? | ☐ True ☐ False ☐ Don't know |
| K32: When should infants born to mothers with CHB be evaluated for HBsAg status? | ☐ True ☐ False ☐ Don't know |
| **E. Treatment** | |
| K33: There is no cure, but there are effective medications to manage and control the disease | ☐ True ☐ False ☐ Don't know |
| K34: What are the treatment goals for CHB patients? | ☐ True ☐ False ☐ Don't know |
| K35: Inhibit the replication of the hepatitis B virus | ☐ True ☐ False ☐ Don't know |
| K36: Prevent disease progression of disease, particularly liver cirrhosis and liver cancer | ☐ True ☐ False ☐ Don't know |
| K37: Prevent mother-to-child transmission (MTCT) | ☐ True ☐ False ☐ Don't know |
| K38: Prevent flare of hepatitis B | ☐ True ☐ False ☐ Don't know |
| **Section 3:Attitudes towards the COVID-19** | |

| **Section 3:Attitudes towards the COVID-19** | |
|---|---|
| **A1: Are you confident in counseling patients about prevention of HBV?** | **Strongly agree  Agree  Neural  Disagree  Strongly disagree** |
| A2: Do you think that the hepatitis B vaccine is safe? | ☐ ☐ ☐ ☐ ☐ |
| A3: Do you think it is necessary to vaccinate newborns for hepatitis B at birth? | ☐ ☐ ☐ ☐ ☐ |
| A4: Are you confident in ordering laboratory tests to monitor CHB patients? | ☐ ☐ ☐ ☐ ☐ |
| A5:Are you confident in prescribing treatment for a patient with chronic hepatitis B? | ☐ ☐ ☐ ☐ ☐ |
| A6: Are you confident in ordering diagnosis tests for patients with chronic HBV? | ☐ ☐ ☐ ☐ ☐ |
| A7: Would you have any concerns having casual contact or working together with a chronic HBV patient in the same office? | ☐ ☐ ☐ ☐ ☐ |
| A8: Would you have any concerns sharing food or utensils with a CHB? | ☐ ☐ ☐ ☐ ☐ |
| **Section 4: Prevention Practices** | |
| P1: Did you get the hepatitis B vaccine before entering practicum at teaching hospitals? | ☐ True ☐ False ☐ Don't know |
| P2: Did you get tested for HBV before entering practicum at teaching hospitals? | ☐ True ☐ False ☐ Don't know |
| P3: Do you consistently wear gloves when administrating injections or performing medical procedures to patients? | ☐ True ☐ False ☐ Don't know |

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الجمهورية اليمنية
وزارة التعليم العالي والبحث العلمي
الجامعة الإماراتية
كلية الطب والعلوم الصحية
قسم طب المجتمع

# تقييم المعرفة والموقف والممارسات لطلاب الطب حول المخاطر المهنية لفيروس الكبد الوبائي (ب) في كلية الطب الجامعة الإماراتية الدولية – اليمن

**بحث مقدم لقسم طب المجتمع، كلية الطب والعلوم الصحية، الجامعة الاماراتية، لتحقيق درجة بكالوريس الطب والجراحة ي الطب العام والجراحة.**

**فريق البحث**

**أنور صالح القديمي**
**عبد العزيز علي الشعيبي**
**محمد يحيى الديلمي**
**رغدة جعفر محمد**
**أمل عبد الكريم الصنوي**
**نجلاء محمد دحقة**
**حورية طلال الصنوي**
**انتصار أحمد السنيدر**
**ياسمين أحمد القراشي**

**إشراف: د.أ. أحمد حمود الشاحذي**

**٢٠٢٢م-١٤٤٣هـ**