

بسم الله الرحمن الرحيم



El-Sheikh Abdullah El-Badri University

Faculty of Health Science



Department of Medical Laboratory Science

Sero-prevalence of hepatitis B virus antigen
and main Risk factors among people in Abu-
Hamad locality River Nile State 2021

*A thesis submitted for partial fulfillment of requirement for the degree
of B. S. C in medical laboratory science (honor)*

Presented by:

1. Asia Ali Ahmed Mohammed
2. Fatima Ismail Hassan Omer
3. Safia Abd- Elaziz Ahmed Ali
4. Sahar Abass Abd-Alrahim Seid-Ahmed
5. Shroug Ali Suliman Ali
6. Mohammed Bakhit Adam Rahamat-Allah

Supervisor by:

Dr. Alwathig Yahia

MBBS-MPS-MD

الآية

قال تعالى : { ذَاكَ مَبْلَغُهُمْ مِنَ الْعِلْمِ
إِنَّ رَبَّكَ هُوَ أَعْلَمُ بِمَنْ ضَلَّ عَنْ سَبِيلِهِ وَهُوَ
أَعْلَمُ بِمَنْ اهْتَدَى }

سورة النجم الآية (30)

Dedication

We dedicated this study to the **Omnipotent Allah** who provided us with the knowledge and understanding as well as the strength to complete it.

Also wholeheartedly we dedicated it to our beloved parents , who continually provide their moral , spiritual , emotional and financial support

.

To our brothers , sisters , relatives , mentor , friends and classmates who shared their words and advice and encouragement to finish this study .

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Firstly our gratitude and prayers to **The Almighty God** , for his mercy, guidance , strength, power of mind , protection and skills and for giving us a healthy life throughout the long path of this research.

We owe so much to our supervisor **Dr. Alwathig Yahia** for his close supervision , valuable advices and stimulating suggestions. His pleasant personality made it easy for us to do this project and complete the research .

Last but not least , we would like to thank everyone who contributed by any means in this study from the beginning, during the processing of the specimens or through the final stage specially people in Abu-Hamad locality .Also our thanks extend to our college and our teachers.

Finally , we would like to thank all the participants for their kind cooperation.

Abstract

Hepatitis B virus also known as serum hepatitis , has incubation period 2 – 6 months. Infection occurs by direct inoculation or by contamination of mucous membranes. It may be self-limiting or develop to cause hepatocellular carcinoma [HCC] that cause death in regions where HBV is endemic and neonatal infection is common. The study aim to determine the sero-prevalence of hepatitis B virus antigen and main risk factors among people in Abu-Hamad locality River Nile state 2021. A cross-sectional study design conducted to collect information from 384 participant selected randomly from Abu-Hamad locality in River Nile state during the period , June to August 2021, through questionnaire by offering a number of questions relevant to the objectives of the study . The statistical analysis was performed by SPSS version 14. The study reflect that 18.5% of participants results were positive for hepatitis B virus, and found association between infected with HBV and some risk factors like: age, residence, alcohol drinking, whipping, etc. The prevalence of Hepatitis B virus in Abu-Hamad is high and the risk factor whipping is associated with infection. Health education to eliminate whipping in social events should be promoted.

الخلاصة

فيروس التهاب الكبد الوبائي النوع (ب) ، يعرف أيضاً بالتهاب الكبد المصلي ، مدة حضانتها من 2-6 شهور . تحدث العدوى عن طريق الحقن المباشر أو تلوث الأغشية المخاطية. يمكن أن يكون ذاتي الشفاء أو يتطور إلى سرطان الخلية الكبدية الذي يسبب الوفاة في المناطق التي يكون فيها فيروس الكبد الوبائي النوع (ب) متوطن وإصابة حديثي الولادة شائعة . تهدف الدراسة لتحديد معدل الانتشار المصلي لفيروس التهاب الكبد الوبائي النوع(ب) وعوامل الخطورة الرئيسية على سكان محلية أبو حمد بولاية نهر النيل 2021 . تم إجراء الدراسة بتصميم مقطع مستعرض وقد تم جمع المعلومات من 384 مشارك تم إختيارهم عشوائياً من سكان محلية أبو حمد بولاية نهر النيل خلال الفترة من شهر يونيو حتى أغسطس 2021 ، من خلال إستبيان يعرض عدد من الأسئلة ذات الصلة بأهداف الدراسة . تم تنفيذ التحليل الإحصائي بإستخدام برنامج التحليل الإحصائي النوع (14). تعكس الدراسة أن 18.5% من نتائج المشاركين كانت إيجابية لفيروس التهاب الكبد الوبائي من النوع (ب) ، ووجدت علاقة بين الإصابة بفيروس التهاب الكبد الوبائي النوع (ب) وبعض عوامل الخطورة مثل : العمر ، السكن ، شراب الكحول ، الجِد ، إلى آخره . خلصت الدراسة إلى أن معدل إنتشار فيروس الكبد الوبائي النوع (ب) في محلية أبو حمد مرتفع ، وعامل الخطورة الجِد له علاقة بالإصابة به . يجب تعزيز التوعية الصحية لإزالة عادة الجِد في المناسبات الإجتماعية .

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List of abbreviations

HBV	Hepatitis B virus
HCC	Hepatocellular cancer
HCV	Hepatitis C virus
ICT	Immune chromatography test
HBsAg	Hepatitis B surface antigen
Anti-HBcAg	Antibody to hepatitis B core antigen
ELISA	Enzyme linked immunosorbent assay
SPSS	Statistical package for social science
HIV	Human immunodeficiency virus

Chapter One

Introduction

1.1 Introduction

Hepatitis B is a viral infection that attacks the liver and can cause both acute and chronic disease. Hepatitis B virus (HBV) disease is serious complication worldwide and it's the most common cause of chronic hepatitis or liver cirrhosis and hepatocellular cancer (HCC)^[1].

It's estimated that universally more than approximately two billion of people have been infected by hepatitis B virus and 350 million of them have chronic condition^[2]. Hepatitis B prevalence is highest in the World Health Organization (WHO) Western Pacific region and the WHO African region, where 6.2% and 6.1% of the adult population is infected respectively. In the WHO Eastern Mediterranean region, the WHO South-East Asia region and the WHO European region, an estimated 3.3%, 2.0% and 1.6% of the general population is infected, respectively. In addition, in the WHO region of Americas, 0.7% of the population is infected. WHO estimates that in 2015, 257 million people were living with chronic hepatitis B infection. IN 2015, hepatitis B resulted in an estimated 887000 deaths, mostly from cirrhosis and hepatocellular carcinoma. As 2016, 27 million people were aware of their infection. While 4.5 million of the people diagnosed were no treatment. At least 391 million people, or 5% of the world's population, had chronic HBV infection as of 2017. While another 145 million cases of acute HBV infection occurred that year. Regional prevalence range from around 6% in Africa to 0.7% in the America. In low prevalence areas, which include Eastern Europe, Russia, and Japan where 2-7% of the population is chronically infected, the disease is predominantly spread among children. Each year, approximately 1 million people die as a result of HBV infection and over 4 million new acute clinical cases occur^[3]. Three quarter of the world population lives in endemic areas of infection^[4]. The prevalence of HBV infection in Ethiopia in 2016 was 0.22, in 2017 was 0.06 in 2018 was 0.07 and in 2019 was 0.06^{[5] [6] [7] [8]}. Sudan is classified among countries of endemic hepatitis B infection (HBV)^[9]. Exposure to the virus varied from 47% - 78%, with a hepatitis B surface antigen prevalence ranging from 6.8% in central Sudan to 26% in southern Sudan. The overall prevalence of HBV in Sudan in 2014 was 4.2%.

The survey included 18 states and HBV prevalence ranged between 0.5% in the Northern state and 0.9 in River Nile to 8.8% in Gadarif^[10].

In 2016 , 1,678 cases recorded in Sudan , 952 cases was in Khartoum state, 96 was in Kassala , 61 was in Red Sea state and 5 was In River Nile state^[11]. In 2018, the prevalence was found to be 12.07% ^[12]. In 2020 the prevalence was found to be 15.51%^[13]. This data presented annually increasing prevalence of HBV in Sudan.

In Abu-Hamad locality a 139 cases of HBV infection died in 2013, and monthly there is 11 new cases present in Kurqus^[14] .

1.2. Research problem

This is of necessary; it is fertile to get effective information about prevalence of hepatitis surface antigen and its risk factors associated with it for transmission HBV infection in Abu-Hamad locality in River Nile state.

1.3. Justification

Prevalence and risk factors may help the health system to minimize the occurrence of disease by vaccination, medication and health education.

Health system also need complementary data for two previous studies in Atbara ,Barber and Ad-Damar done by El-sheikh Abdullah El-Badri university students of Medical Laboratory Science department to determine prevalence in all River Nile State.

1.4. Objective

1.4.1 General objectives

To detect the sero-prevalence of hepatitis B virus antigen and main Risk factors among people in Abu-Hamad locality River Nile state in 2021.

1.4.2 Specific objectives

1. To detect prevalence of hepatitis B virus antigen among people in Abu-Hamad 2021.
2. To determine main risk factors of hepatitis B virus in Abu-Hamad 2021.

Chapter Two

Literature Review

2. Literature review

2.1. Definition:

Hepatitis is an infectious disease of the liver caused by the hepatitis virus. The most common viruses are named for the first three letters of the alphabet, A, B and C. These viruses each cause a different type of infection with different symptoms and duration of illness. HBV and HCV are common nosocomial infections that cause higher rates of mortality and morbidity in blood recipient than other population. In addition to causing hepatitis, infection with HBV can be complicated to liver cirrhosis and hepatocellular carcinoma ^[15] , The HBV particle, (virion) consists of an outer lipid envelope and an icosahedral nucleocapsid core composed of protein. These virions are 42 nm in diameter and are sometimes referred to as "Dane particles". The nucleocapsid encloses the viral DNA and a DNA polymerase that has reverse transcriptase activity. The outer envelope contains embedded proteins that are involved in viral binding and entry into susceptible cells. The virus is one of the smallest enveloped animal viruses, but pleomorphic forms exist, including filamentous and spherical bodies lacking a core. These particles are composed of the lipid and protein that forms part of the surface of the virion, which is called the surface antigen (HBsAg), and is produced in excess during the life cycle of the virus ^[16]. Acute infection with hepatitis B virus is associated with acute viral hepatitis- an illness that begins with general ill-health, loss of appetite, nausea, vomiting, body aches, mild fever, and dark urine, and then progresses to development of jaundice. It has been noted that itchy skin has been an indication as a possible symptom of all hepatitis virus types. The illness lasts for a few weeks and then gradually improves in most affected people. A few people may have more severe liver disease (fulminant hepatic failure), and may die as a result.

The infection may be entirely asymptomatic and may go unrecognized ^[17].

HBV has three main modes of transmission are via blood, during sexual intercourse, and prenatally from mother to newborn ^[18].

2.2. Previous studies

Eshan U. Patel , Chloe Thio and et al in January 2019 published a study aimed to estimate the prevalence of hepatitis B and hepatitis D virus infection in the United States. The method used was cross-sectional study , conducted using collected data from the 2011-2016 by the National Center for Health Statistics (NCHS) . The study resulted among adults was 0.36% and 3.4% in non-Hispanic Asians^[19] .

In Slovakia , May 2018, Sylvia Drazilova , Martin Janicko , Daniel Pella and et al were carry out a study aimed to map hepatitis B prevalence in Roma and compare it to non – Roma population and explore potential socio-economic and health related risk factor. The study design was cross-sectional include total of 855 participants randomly sampled , comprehensive questionnaire about risk factors was administered and blood samples were drawn for HBV serology and virology test , the study resulted that prevalence of hepatitis surface antigen (HBsAg) and anti-hepatitis B core antigen (AntiHBcAg) was 7.7% and 34.6% respectively and Roma population had significantly higher prevalence of HBV infection , the main risk factor for HBsAg positivity were Roma ethnicity, male sex and tattoo. The study concluded that there is very high prevalence of hepatitis B in Roma communities in Slovakia^[20] .

Shigui Yang, Cheng Ding , Yuanxia Cui , Jun Yao and et al in 2017 conducted a study aimed to assess prevalence and influencing factors of hepatitis B among a rural residential population in Zhejiang Province , China .The method used was cross-sectional study , stratified multistage cluster sampling was utilized in five districts , a structured questionnaire was used to collect the information . The study resulted that the positive rate of hepatitis B surface antigen (HBsAg) was 4.04% , and 3.85% when standardized by age and gender. Multistage logistic regression indicated that occupation, living status, history of hepatitis examinations, vaccination and district were the influencing factors^[21] .

Alashary Adam Eisa Hamdoon , Sleem Buyyan Aljahdali and et al in 2019, conducted study aimed to estimate the prevalence of HBV and HCV and associated risk factor among blood donor attending Alleith General Hospital Saudi Arabia . The method used was cross-sectional descriptive study, blood sample were taken from all blood donor total average 473 donors, tests by ELISA. The result was that the prevalence of HBV were found 6.1% , high prevalence of HBV , and low prevalence of HCV , highest infected blood donors were found in age group 27-36 years, risk factor significantly associated with HBV and HCV were found^[22] .

In September 2020 Philip Apraku was published a study aimed to determine the prevalence and risk factor of hepatitis B virus (HBV) infection among Medical Laboratory Science Students [MLSSs] in University of Health and Allied [UHAS] , Ghana . The study was cross-sectional study design employed to recruit 178 students into study, a self-administered questionnaire was used to gather relevant information on risk factors and HBV diagnostic test kit was used to test for HBV infection. The study resulted that the prevalence of HBV infection among MLSSs was 6.7%, the most risk factor of HBV infection was torn gloves and splash of blood and body fluid. The study concluded that sharp related injuries , torn gloves and vaccination were strong predictors of HBV infection and since infection among students was high^[23] .

Adebola T. Olyinka , Akin Oyemakinde and et al in 2016 published a study that aimed to determine the prevalence, distribution of HBV and factor associated with infection in an apparently health population in Nigeria . A cross-sectional study among the general population was conducted employing a multistage sampling technique. Data on demographic, social and behavioral indicators were collected using questionnaires and blood samples tested for HBV seromarkers , descriptive bivariate and multivariate analyses were done. The study showed that the prevalence of hepatitis B infection was 12.2% and that was related to dental procedure outside the health facility, local circumcision and uvulectomy and this highest prevalence need for improve vaccination against HBV^[24] .

Behailu Tsegaye , Eyayou Girma , Tesfaye Kanko and et al in 2020 , disseminated a study aimed to estimate the sero-prevalence and risk factors for hepatitis B virus infection among the consumers of alcoholic beverage , cheka in Konso zone south western Ethiopia .The method used was community-based cross-sectional study , conducted in a total of 633 cheka consumers between October 01, 2018 , and May 31 , 2019 . The socio-demographic characteristics and associated factors were collected using a pre-tested semi-structured questionnaire. The study resulted that the prevalence of HBV was found to be 18.2%. Gender (male), age (35-44 yrs), nature of job (daily laborer), awareness about the transmission of the disease and previous history of contacts with patients having liver disease, were identified as factors which are being significantly associated with the HBV infection ^[25] .

Yassin Alsony Almobarak Ahmed in 2014 conducted study aimed to investigate HBV infection among men whipped during Sudanese wedding ceremonies in Al- Gadarif State using ELISA. the study was descriptive non probability comparative cross-sectional , a total of 100 rural participants living in Al-Gadarif state , 50 whipped men and 50 not whipped were controlled , the study resulted that 9 (18%) of whipped men were positive and 7(2%) positive in other group, showed relationship between HBsAg and frequency of whipping ritual among whipped men during wedding ceremonies in Al-Gadarif ^[26] .

In April 12, 2017 Mohammed Mustafa Ahmed Mohammed printed a study aimed to estimate prevalence of HBV, HCV and HIV among Whip Battered individuals during social events in North Sudan. The study was analytic study, sample collect from 126 cases in north Sudan target age above 12 years administrated by randomized method male class. No HIV, HBV cases in all study group. In this study there was no relationship between HBV and hitting , non-hitting , socistatus , occupation, education and all of Data related to hitted person that because we have not any case of HBV ^[27] .

Abdallah Hassan Mudardum and Abbakar Adam Mohammed in 2019 published a study aimed to determine the sero-prevalence of HBV and risk factors for its acquisition among antenatal care attendants in UM Dafog area, South Darfur State, Sudan. The method used is cross-sectional study, blood samples were collected from 165 pregnant women, socio-demographic characteristics and risk factors were collected through face-to-face interviews using structured questionnaires. The study resulted in HBsAg being detected in 8.5% of the study population. Participants from the Central African Republic recorded a higher prevalence (18.2%) than those from Sudan (7%). There was no significant association between the prevalence of HBsAg and residence. The study concluded that the prevalence of HBV among pregnant women in the UM Dafog area is high, indicating endemicity according to WHO [28].

Chapter Three

Methodology

3. Material and methodology

3.1. Study design

Cross sectional study design in community base.

3.2. Study area

The study was conducted at Abu-Hamad locality in River Nile State.

3.3. Study setting

The study was conduct in household

3.4. Study population

People live in Abu-Hamad locality River Nile state " community base".

1. Inclusion criteria:

Adult people live in Abu-Hamad locality River Nile state.

2.Exclusion criteria:

Dialysis patients, children and elderly people (above 60).

3.5. Sample size

384 samples are collect from various capillary bloods for ICT viral scanning according to the equation:

$$n = \frac{z^2 \times p \times q}{d^2}$$

z: factor (1.96)

p: prevalence

d: degree of precision (0.05)

q: (1-p)

3.6. Sample technique

The selection of house was randomly from Abu-Hamad locality in River Nile State.

3.7. Study period:

From June to August 2021.

3.8. Data collection tools

Primary data was collected by using questionnaire, taking 2 cc (2ml) of blood sample by well-trained person from cubital vein. All test ICT rapid diagnostic technique with error = 0.3%

3.8.1. ICT Method

principle

The HBsAg rapid test cassette is a qualitative solid phase two side sandwich immune assay for the detection of HBsAg in serum or plasma . The membrane is pre coated with anti HBsAg antibody on the test line region of the cassette . During testing the serum or plasma specimen reacts with particle coated with anti HBsAg antibodies . The mixture migrated upward on the membrane chromatographically by capillary action to react with anti HBsAg antibody on the membrane and the generate are colored line . The presence of this colored line in the test region indicated a positive result , while it is absence indicated a negative result . To serve as a procedural control, a colored line will always appear in the control line region indicated that proper volume of specimen has been added and membrane wicking has occurred ^[29] .

Materials provided

- Test cassette
- Droppers
- Package insert
- Specimen collection containers
- Centrifuges
- Timer
- Gloves
- Syringe
- Cotton
- Tourniquet

Procedure

Step 1 : remove the cassette from sealed foil pouch and use it as soon as possible. Best results will be obtained if the assay is performed immediately after opening the foil pouch.

For serum or plasma specimen .

Step 2 : Hold the dropper vertically and transfer three drops of serum or plasma (approximately 120 microliter) to the specimen well of test device and start the timer . See illustration below .

Step 3 : wait for the colored line is appeared . The result should be read at 15-30 minutes . Do not interpret the result after 30 minutes .

3.9. Data analysis

Data was analyzed by using statistical package for social science (SPSS). Describe table and graph was present . Chi-square ALL test was used to determine the risk factor, p-value is 0.05 is considered significant .

3.10. Study variables

Age , gender , residence , level of education , occupation ,marital status , socio-economic status ,whipping, blood transfusion , surgical operation, alcohol drinking , vaccination ,un legal sexual intercourse, hospital admission , dental surgery , history of injection ,family or friend with liver disease or recurrent jaundice, history of sharing personal tools , skin scarring and tattooing .

3.11. Ethical consideration

Ethical approval for our study was given by the University of El-sheikh Abdullah El-badri ethics committee and permission from Ministry of health granted as well.

Information about the study was deliver to the participant and consent was obtain then face to face interview conduction .

Inform consent was wrote to obtain from participant who was agree to participate in the study with commitment with confidentiality , benefit , justice and right of withdraw .

Chapter Four

Results

4.1 Results

This analytical prospective descriptive study which was conducted in Abu-Hamad during the period from June to August 2021. The study aimed to detect the sero-prevalence of hepatitis B virus antigen among people in Abu-Hamad locality River Nile State .

Our results showed that 18.5% of all participants in Abu-Hamad during the period from June to August were positive for hepatitis B virus.

After statistical analysis by SPSS , the analysis shows that there is significant association between hepatitis B results and study risk factors including age , residence , socio-economic status , marital status , whipping , Alcohol drinking ,hospital admission , participant's family or friend with liver disease or recurrent jaundice . vaccination and history of sharing personal tools.

All specimen were taken from 384 participants were included in this study , 18.5% of them were positive , while other sample were negative .

All of participants according to :

- Age group : 18-30 (41.4%) , 31-40 (24.2%) , 41-50 (20.3%) and 51-60 (14.1%) as it showed in figure 4.1.2
- Gender : 244 (63.5%) of them were male and 140 (36.5%) were female as it showed in figure 4.1.3
- Residence : they are all from Abu-Hamad locality residences , 201 (52.3%) were from rural and 183 (47.7%) were from urban as it showed in figure 4.1.4
- Level of education : 33 (8.6%) of them were illiterates , 72 (18.8%) were studied primary/khalwa ,149 (38.8%) were studied secondary , 121 (31.5%) were studied university and 9 (2.3%) of them are post graduated as it showed in figure 4.1.5
- Occupation : 61 (15.9%) of them were farmer , 98 (25.5%) were worker , 39 (10.2%) were officer-governmental , 34 (8.9%) were officer-private , 7 (1.8%) were idle , 49 (12.8%) were student , 7 (1.8%) were retired and 89 (23.3%) were housewives as it showed in figure 4.1.6
- Socio-economic status : 132 (34.4%) of them were low , 222 (57.8%) were middle and 30 (7.8%) were high as it showed in figure 4.1.7

- Marital status : 142 (37.0%) of them were single , 13 (3.4%) were divorced , 16 (4.2%) were widowed and 213 (55.5%) were married as it showed in figure 4.1.8
- Un legal sexual intercourse : 384 (100%) of them had no un legal sexual intercourse as it showed in table 4.1.9
- Alcohol drinking : 49 (12.8%) of them were drinking alcohol while 335 (87.2%) were not as it showed in table 4.1.10
- Hospital admission : 208 (54.2%) of them were admitted to hospital while 176 (45.8%) were not as it showed in table 4.1.11
- Blood transfusion :46 (12%) of them were transfused blood while 338 (88%) other were not as it showed in table 4.1.12
- Surgical operation : 117 (30.5%) of them were surgically operated while 267 (69.5%) were not as it showed in table 4.1.13
- Dental surgery : 105 (27.3%) of them had dental surgery while 279 (72.7%) had not as it showed in table 4.1.14
- History of injection : 384 (100%) of them had history of injection as it showed in table 4.1.15
- Family or friend with liver disease or recurrent jaundice : 149 (38.8%) of them had family or friend with liver disease or recurrent jaundice while 235 (61.2%) had not as it showed in table 4.1.16
- Vaccination : 40 (10.4%) of them were vaccinated while 344 (89.6%) other were not as it showed in table 4.1.17
- Skin tattooing : 384 (100%) of them have no tattooing as it showed in table 4.1.18
- Skin scarring : 34 (8.9%) of them have scarring while 350 (91.1%) other have not as it showed in table 4.1.19
- Whipping : 72 (18.8%) of them were whipping while 312 (81.3%) other were not as it showed in table 4.1.20
- History of sharing personal tools : 212 (55.2%) of them had history of sharing personal tools while 172 (44.8%) had not as it showed in table 4.1.21

Table (4.1.1) sero-prevalence of hepatitis B virus among people in Abu-Hamad.

Result of Hepatitis

		Frequency	Percent
Valid	positive	71	18.5
	negative	313	81.5
	Total	384	100.0

Result of Hepatitis

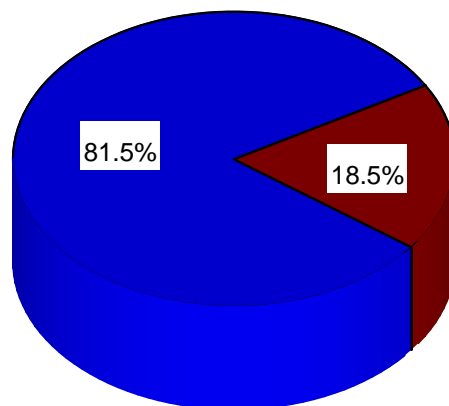


Figure (4.1.2) Distribution of participants according to age



Figure (4.1.3) Distribution of participants according to gender

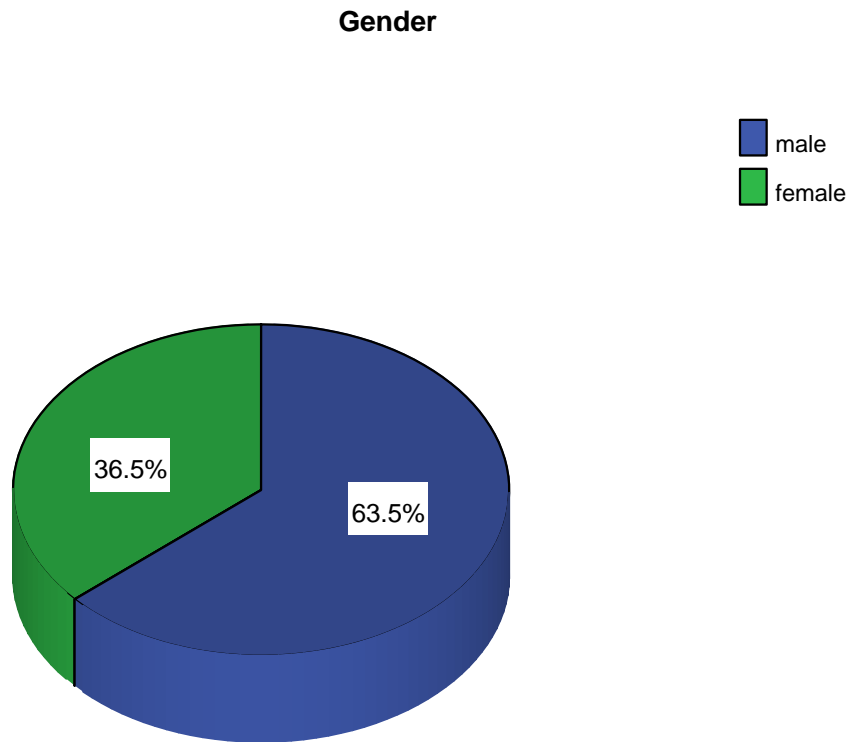


Figure (4.1.4) Distribution of participants according to

Residence

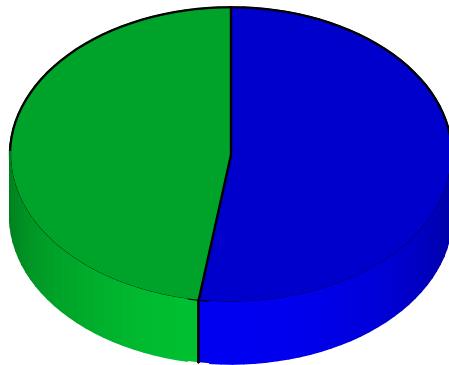


Figure (4.1.5) Distribution of participants according to level of education

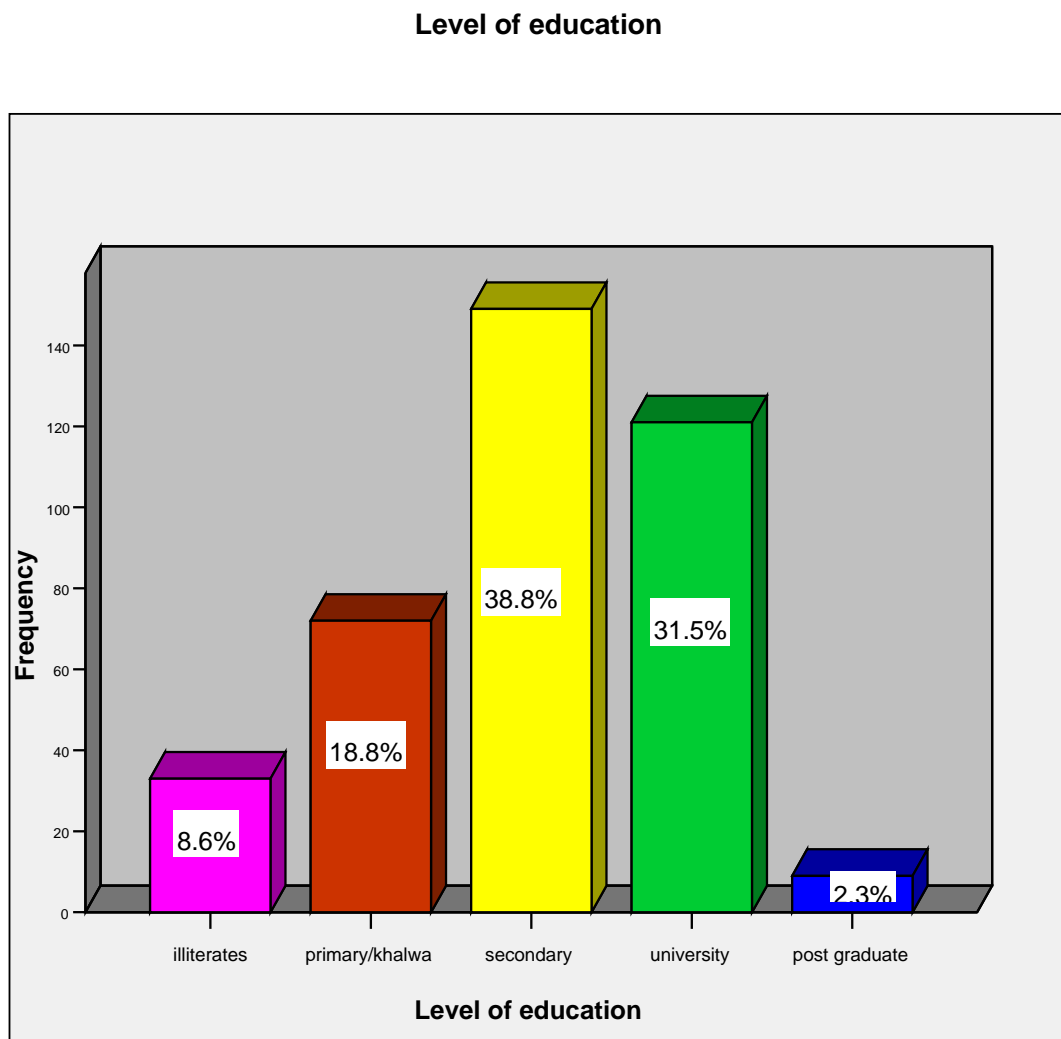


Figure (4.1.6) Distribution of participants according to occupation

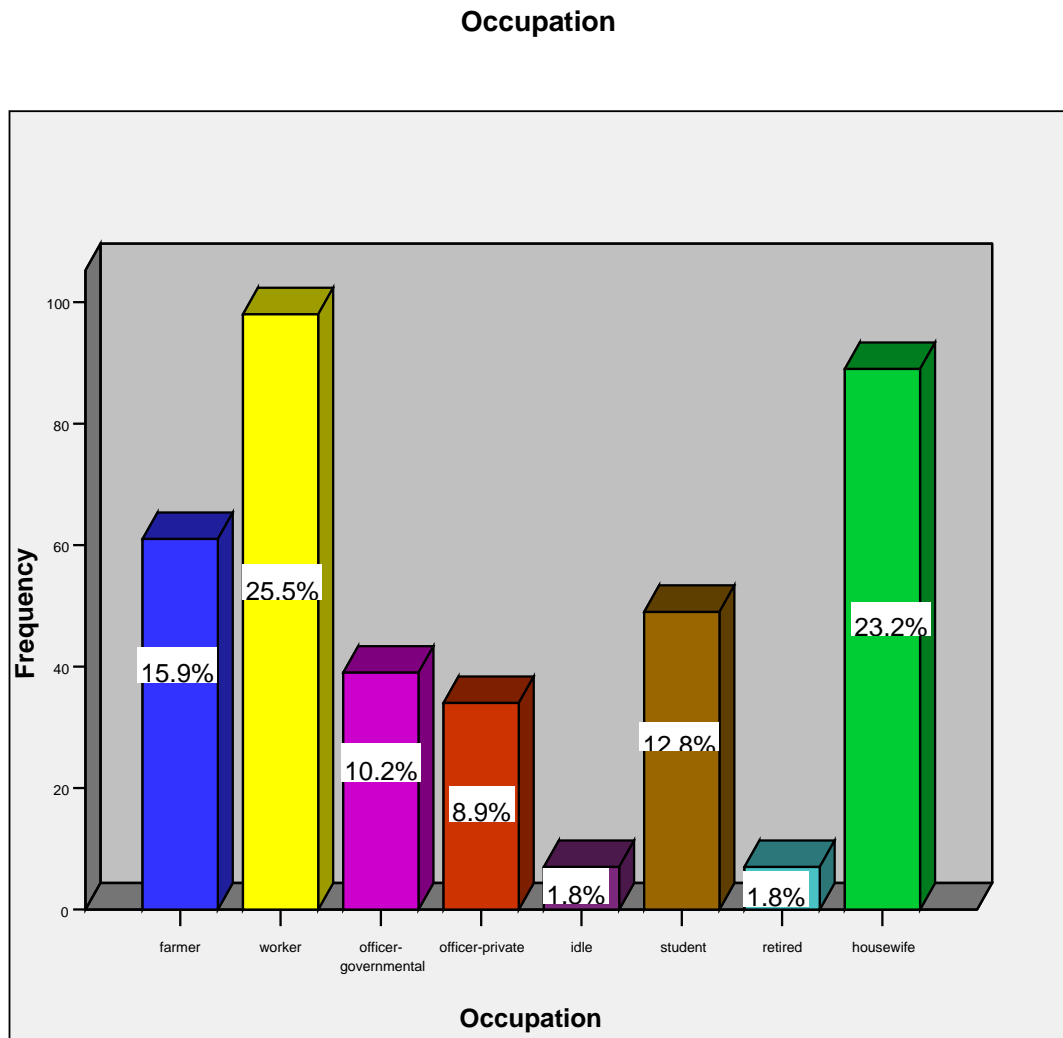


Figure (4.1.7) Distribution of participants according to socio-economic status

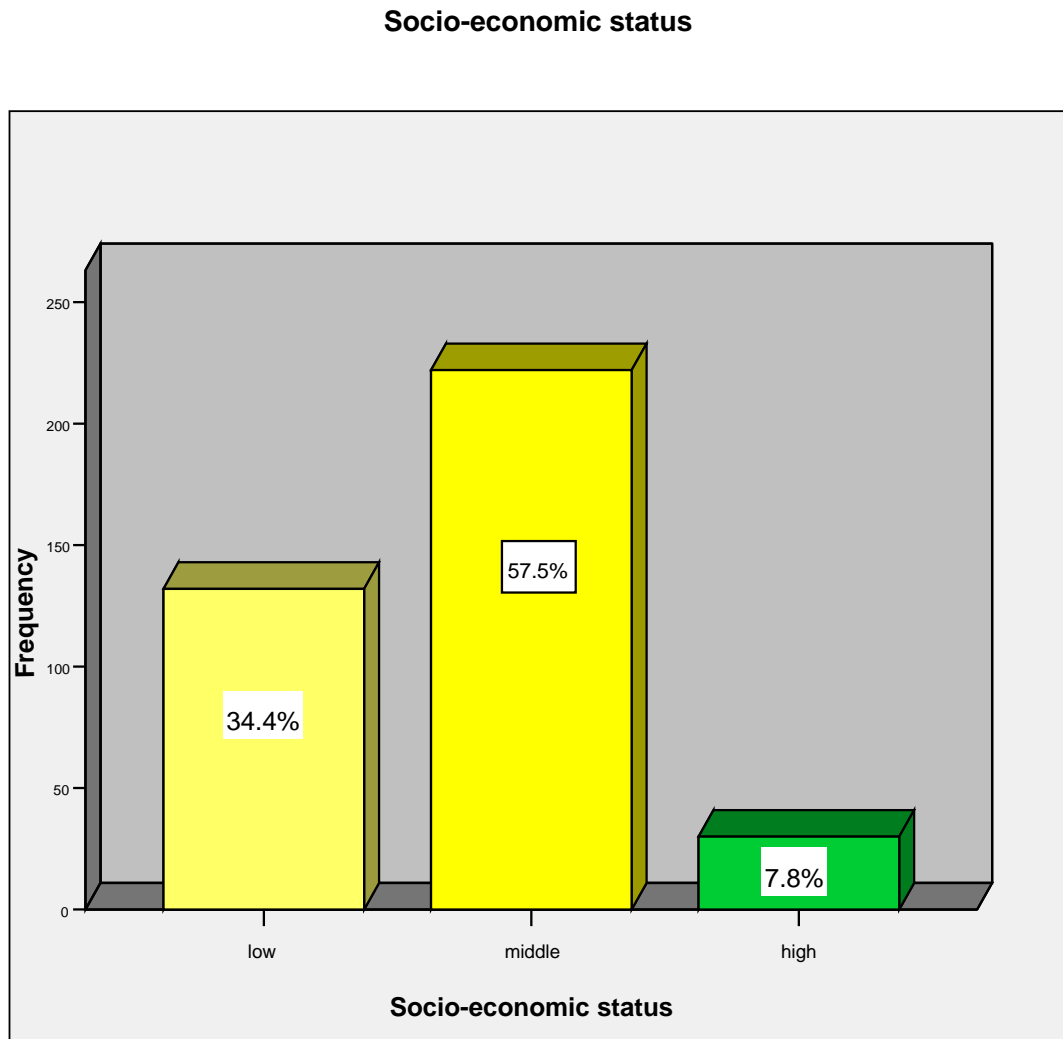
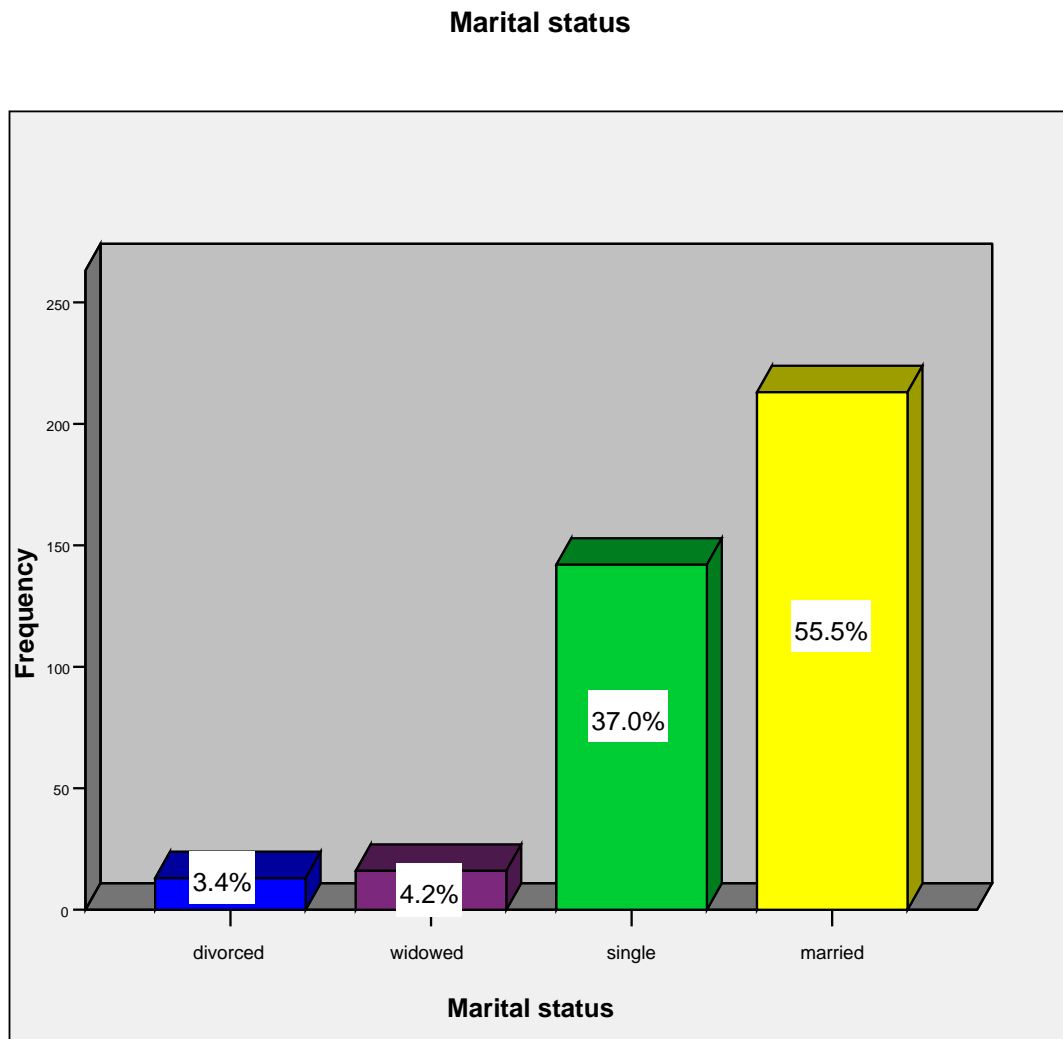


Figure (4.1.8) Distribution of participants according to marital status



Table(4.1.9) Distribution of participants according to

Unlegal sexual intercourse

	Frequency	Percent
Valid no	384	100.0

Table(4.1.10) Distribution of participants according to

Alcohol drinking

	Frequency	Percent
Valid yes	49	12.8
no	335	87.2
Total	384	100.0

Table(4.1.11) Distribution of participants according to

Hospital admission

	Frequency	Percent
Valid yes	208	54.2
no	176	45.8
Total	384	100.0

Table(4.1.12) Distribution of participants according to

Blood transfusion

	Frequency	Percent
Valid yes	46	12.0
no	338	88.0
Total	384	100.0

Table(4.1.13) Distribution of participants according to

Surgical operation

	Frequency	Percent
Valid yes	117	30.5
no	267	69.5
Total	384	100.0

Table(4.1.14) Distribution of participants according to

Dental surgery

	Frequency	Percent
Valid yes	105	27.3
no	279	72.7
Total	384	100.0

Table(4.1.15) Distribution of participants according to

History of injection

	Frequency	Percent
Valid yes	384	100.0

Table(4.1.16) Distribution of participants according to

Family or friend with liver disease or recurrent jaundice

	Frequency	Percent
Valid yes	149	38.8
no	235	61.2
Total	384	100.0

Table(4.1.17) Distribution of participants according to

Vaccination

	Frequency	Percent
Valid yes	40	10.4
no	344	89.6
Total	384	100.0

Table(4.1.18) Distribution of participants according to

Skin tattooing

	Frequency	Percent
Valid no	384	100.0

Table(4.1.19) Distribution of participants according to

Skin scarring

		Frequency	Percent
Valid	yes	34	8.9
	no	350	91.1
Total		384	100.0

Table(4.1.20) Distribution of participants according to

Whipping

		Frequency	Percent
Valid	yes	72	18.8
	no	312	81.3
Total		384	100.0

Table(4.1.21) Distribution of participants according to

History of sharing personal tools

		Frequency	Percent
Valid	yes	212	55.2
	no	172	44.8
Total		384	100.0

4.2. Comparisons by cross tabulation according to hepatitis B results

Table (4.2.1) co-relation between presence of hepatitis B virus antigen and age .

		Result of Hepatitis		Total
		positive	negative	
Age	18-30	41	118	159
	31-40	17	76	93
	41-50	6	72	78
	51-60	7	47	54
Total		71	313	384

Chi-square Tests

P-value is 0.002 so there is significance between hepatitis B results and participant's age .

Table (4.2.2) co-relation between presence of hepatitis B virus antigen and gender.

		Result of Hepatitis		Total
		positive	negative	
Gender	male	46	198	244
	female	25	115	140
Total		71	313	384

Chi-square Tests

P-value is 0.810 so there is no significance between hepatitis B results and participant's gender .

Table (4.2.3) co-relation between presence of hepatitis B virus antigen and residence.

		Result of Hepatitis		Total
		positive	negative	
Residence	rural	27	174	201
	urban	44	139	183
Total		71	313	384

Chi-square Tests

P-value is 0.007 so there is significance between hepatitis B results and participant's residence .

Table (4.2.4) co-relation between presence of hepatitis B virus antigen and level of education.

		Result of Hepatitis		Total
		positive	negative	
Level of education	illiterates	7	26	33
	primary/khalwa	12	60	72
	secondary	28	121	149
	university	24	97	121
	post graduate	0	9	9
Total		71	313	384

Chi-square Tests

P-value is 0.768 so there is no significance between hepatitis B results and participant's level of education .

Table (4.2.5) co-relation between presence of hepatitis B virus antigen and occupation.

		Result of Hepatitis		Total
		positive	negative	
Occupation	farmer	9	52	61
	worker	23	75	98
	officer-governmental	4	35	39
	officer-private	0	34	34
	idle	0	7	7
	student	17	32	49
	retired	3	4	7
	housewife	15	74	89
Total		71	313	384

Chi-square Tests

P-value is 0.480 so there is no significance between hepatitis B results and participant's occupation .

Table (4.2.6) co-relation between presence of hepatitis B virus antigen and socio-economic status.

		Result of Hepatitis		Total
		positive	negative	
Socio-economic status	low	30	102	132
	middle	41	181	222
	high	0	30	30
Total		71	313	384

Chi-square Tests

P-value is 0.013 so there is significance between hepatitis B results and participant's socio-economic status .

Table (4.2.7) co-relation between presence of hepatitis B virus antigen and marital status.

		Result of Hepatitis		Total
		positive	negative	
Marital status	single	39	103	142
	divorced	1	12	13
	widowed	3	13	16
	married	28	185	213
Total		71	313	384

Chi-square Tests

P-value is 0.001 so there is significance between hepatitis B results and participant's marital status .

Table (4.2.8) co-relation between presence of hepatitis B virus antigen and alcohol drinking.

		Result of Hepatitis		Total
		positive	negative	
Alcohol drinking	yes	17	32	49
	no	54	281	335
Total		71	313	384

Chi-square Tests

P-value is 0.002 so there is significance between hepatitis B results and alcohol drinking .

Table (4.2.9) co-relation between presence of hepatitis B virus antigen and hospital admission.

		Result of Hepatitis		Total
		positive	negative	
Hospital admission	yes	62	146	208
	no	9	167	176
Total		71	313	384

Chi-square Tests

P-value is 0.000 so there is significance between hepatitis B results and hospital admission .

Table (4.2.10) co-relation between presence of hepatitis B virus antigen and blood transfusion .

		Result of Hepatitis		Total
		positive	negative	
Blood transfusion	yes	8	38	46
	no	63	275	338
Total		71	313	384

Chi-square Tests

P-value is 0.838 so there is no significance between hepatitis B results and blood transfusion.

Table (4.2.11) co-relation between presence of hepatitis B virus antigen and surgical operation.

		Result of Hepatitis		Total
		positive	negative	
Surgical operation	yes	20	97	117
	no	51	216	267
Total		71	313	384

Chi-square Tests

P-value is 0.642 so there is no significance between hepatitis B results and surgical operation.

Table (4.2.12) co-relation between presence of hepatitis B virus antigen and dental surgery.

		Result of Hepatitis		Total
		positive	negative	
Dental surgery	yes	17	88	105
	no	54	225	279
Total		71	313	384

Chi-square Tests

P-value is 0.478 so there is no significance between hepatitis B results and dental surgery.

Table (4.2.13) co-relation between presence of hepatitis B virus antigen and family or friend with liver disease or recurrent jaundice.

		Result of Hepatitis		Total
		positive	negative	
Family or friend with liver disease or recurrent jaundice	yes	62	87	149
	no	9	226	235
Total		71	313	384

Chi-square Tests

P-value is 0.000 so there is significance between hepatitis B results and participant's family or friend with liver disease or recurrent jaundice .

Table (4.2.14) co-relation between presence of hepatitis B virus antigen and vaccination.

		Result of Hepatitis		Total
		positive	negative	
Vaccination	yes	0	40	40
	no	71	273	344
Total		71	313	384

Chi-square Tests

P-value is 0.001 so there is significance between hepatitis B results and vaccination .

Table (4.2.15) co-relation between presence of hepatitis B virus antigen and skin scarring.

		Result of Hepatitis		Total
		positive	negative	
Skin scarring	yes	6	28	34
	no	65	285	350
Total		71	313	384

Chi-square Tests

P-value is 0.895 so there is no significance between hepatitis B results and Participant's skin scarring.

Table (4.2.16) co-relation between presence of hepatitis B virus antigen and whipping.

		Result of Hepatitis		Total
		positive	negative	
Whipping	yes	42	30	72
	no	29	283	312
Total		71	313	384

Chi-square Tests

P-value is 0.000 so there is significance between hepatitis B results and whipping .

Table (4.2.17) co-relation between presence of hepatitis B virus antigen and history of sharing personal tools.

		Result of Hepatitis		Total
		positive	negative	
History of sharing personal tools	yes	70	142	212
	no	1	171	172
Total		71	313	384

Chi-square Tests

P-value is 0.000 so there is significance between hepatitis B results and History of sharing personal tools .

Chapter Five

Discussion

5.1. Discussion

This study was conducted in Abu-Hamad locality River Nile state. In this study, we found that the main age among participants is youth (18-30). The most of participants was male. In other hand the participants is almost similar in percentage of those from rural or urban, common level of education in participants was secondary school then university level. In related to occupation there are two more frequency participants job it is worker and housewife , more than half of participants have middle socio-economic status , majority of them is married in marital status.

In this study we found that the prevalence of HBV about one fifth have positive result. This result was similar to study conducted in Ethiopia in 2020, in Al-Gadarif in 2014 and in Umdafog [South Darfur state] on participant from Central Africa Republic in 2019. [25, 26, 28]

And this result differ from another studies conducted in United State in 2019 ,in Slovakia in 2018 , in China in 2019 , in Saudi Arabia in 2019 , in Ghana in 2020 , in Nigeria in 2016 and North Sudan in 2017 , that show results less than prevalence of our study . These differences mainly due to vaccination, health education and torn gloves. [19, 20 , 21, 22 , 23, 24, 27]

Whipping in social event was found associated with infected with HBV antigen. This result was similar to study conducted in Al-Gadarif before 7 years . And it was differ from study conducted in North Sudan in 2017 resulted that there is no association between infected with HBV antigen and whipping during social events due to it carry out with small sample size (126) compare to population density in North Sudan . [27]

The common risk factor of infected with HBV antigen is hospital admission, alcohol drinking , rural residence and history of family or friend with liver disease or recurrent jaundice .

This risk factor found to be not different from study conducted by Eyayou Girman , Tesfaye Kanko and et al in 2020 , and another study conducted by Yassin Alsony in 2014 . [25, 27]

This risk factor already known previously in medical science but the majority of factor it may differ from society to another.

No association between infected with HBV antigen and blood transfusion, surgical operation and dental surgery is ascribed to following Standard Operating Procedures (SOPs) and healthy protocols in hospitals, health centers and clinics.

5.2. Conclusion

The prevalence of HBV in Abu-Hamad is high and the risk factor whipping is associated with infection.

5.3. Recommendation

1. To communicate this result of study with Health system and Ministry of Health.
2. To build and promote program of health education to eliminate whipping in social event in River Nile state.
3. To promote health and counselling of those who infected to be aware about control of transmission or prevention of transmission.
4. Administrate HBV vaccine in all Abu-Hamad locality.
5. Further research to make evidence about transmission through whipping.

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Appendix (1)

Questionnaire

El-Sheikh Abdullah El-Badri University

Sero-prevalence of hepatitis B virus antigen and main Risk factors among people in Abu-Hamad locality River Nile State 2021

1. Age : 18-30 years
: 31-40 years
: 41-50 years
: 51-60 years
2. Gender: male female
3. Residence : rural urban
4. Level of education : Illiterates
primary/khalwa secondary
university Post graduate
5. Occupation : Farmer worker officer -
governmental private
Idle Student retired
housewife
6. Socio-economic status : Low Middle High
7. Marital status : Single Divorced
Widowed Married

8. Un legal sexual intercourse : Yes No
9. Alcohol drinking : Yes No
10. Hospital admission : Yes No
11. Blood transfusion : Yes No
12. Surgical Operation : Yes No
13. Dental surgery : Yes No
14. History of injection : Yes No
15. Family or friend with liver disease or recurrent jaundice : Yes
 No
16. Vaccination : Yes No
17. Skin tattooing: Yes No
18. Skin scarring: Yes No
19. Whipping : Yes No
20. History of sharing personal tools: Yes No

Results of hepatitis

1. Positive 2. Negative