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Assessment of knowledge attitude and behavior towards hepatitis B and its vaccine among the population in Benghazi

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Abstract

Background: Hepatitis B (HepB) is a major global public health problem and a leading cause of liver cirrhosis and hepatocellular carcinoma, with an estimated 296 million people chronically infected worldwide. In Libya, a 2014 epidemiological study reported a HepB surface antigen (HBsAg) seroprevalence of 2.2% in the general population, classifying the country as having an intermediate level of HBV endemicity.**The aim:** to assess gaps in knowledge, attitudes, and behaviors toward viral hepatitis among the Benghazi public and examine their association with key demographic factors, in order to inform local efforts toward achieving the World Health Organization's viral hepatitis elimination targets. **Method**: A cross-sectional survey was conducted in Benghazi in September and October 2023. Online questionnaires with voluntary response sampling were used as a sampling technique. Statistical analyses were performed using SPSS.28. The *p*-value ≤0.05 was set as the significance level of the study. **Results**: 303 participants completed the survey and were included in the present analysis. Of the 303 participants, 191 (63%) were female, with the majority of 137 (45.2%) between 20 and 30 years old. 200 (66%) attended university; 95 (31.4%) are students; and 173 (57.1%) are single. Of the participants, only 29.4% had good knowledge and 70.6% had poor knowledge of HBV and its vaccine. 89.1% of the 303 participants had a positive attitude toward HBV and its vaccine, compared to 10.9% who had a negative attitude. The majority, 66.7%, rated participants' general behavior toward HBV as poor, while 33.3% demonstrated good behavior toward HBV and its vaccine. There is a significant correlation between Attitude with age and behavior with education. **Conclusion**: The study revealed moderate knowledge and generally positive attitudes toward hepatitis B among the Benghazi public, but preventive behaviors, including screening and vaccination, remained limited. These findings highlight the need for targeted awareness, vaccination promotion, and stigma-reduction programs to support the WHO goal of hepatitis B elimination.

Keywords: Hepatitis B Virus (HBV),Knowledge, Attitude, and Practice (KAP),HBV Vaccinatio,Public Health Awarenes

Introduction

Hepatitis B (Hep B) infection is a global public health problem of great concern. It is associated with significant morbidity and mortality. The disease spectrum is highly diverse, ranging from moderate to chronic liver illnesses such as hepatocellular carcinoma and cirrhosis, all of which are considered fatal consequences.[1]

Chronic infection with hepatitis B virus (HBV) affects approximately 296 million people worldwide and is the most common cause of liver cirrhosis and liver cancer worldwide.[2] HBV-related liver cirrhosis resulted in an estimated 331,000 deaths in 2019, and it is estimated that deaths from HBV-related liver cancer were 192,000 in 2019, an increase from 156,000 in 2010.[2] Although the World Health Organization (WHO) aims to eliminate viral hepatitis as a public health problem by 2030, annual global deaths from HBV are projected to increase by 39% from 2015 to 2030 if the status quo remains in place.[2]

The prevalence of HBV infection is classified into low (< 2%), low-intermediate (2– 4.9%), high-intermediate (5-7.9%), and high (≥ 8). [3] HBsAg is of the main concern, especially for the Western Pacific regions with 6.25 seropositivity. The global prevalence of chronic hepatitis B infection in the Eastern Mediterranean Region, South-East Asia Region, European Region, Regions of the Americas, and African Region is estimated at 3.3% , 2.0%, 1.6%, 0.7%, and 6.1% respectively.[3,4]

Qirbi et al., study looking at the epidemiology of HBV infection in the Middle East in 2001 showed that Libya has a prevalence rate of 2 to 6%. [5]. The lower prevalence rate of HBV observed (2.2%) in Libya classifies it in the lower part of the low-intermediate endemicity class (2−4.9% category), even though North Africa is overall an area of relatively high HBV endemicity. Tunisia, Algeria, and Morocco fall in the intermediate category, with current infection rates of

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about 7%.[6] The lower rate in Libya compared to the high endemicity surrounding areas could be due to the better socioeconomic conditions and the early efforts by the National Prevention Program of Infectious Diseases in Libya. Vaccination against HBV infection has been strongly encouraged and offered free of charge in Libya since 1989, and in 1991 it became compulsory for infants 3 months of age and children 12 years of age.

HepB is highly contagious, 50-100 times more infectious than the Human Immunodeficiency Virus (HIV), and is transmitted between people via blood, semen, vaginal fluids, and mucous membranes; thus, the most common modes of transmission are unprotected sex, unsafe blood transfusions, unsafe needle use, and transmission from mother to child at birth [1]. Hepatitis viruses A to G have been identified, with HepB remaining the most dangerous, with a significant chance of mortality from liver cirrhosis and carcinoma. HBV is distinct from other sexually transmitted illnesses in that it can be prevented using vaccinations. [1].

Eni et al., showed that the burden of HepB is on the increase even though effective vaccines to prevent the disease have existed since the 1980s [7]. This continued increase in burden is due to the ineffective or nonexistence of hepatitis management programs in the African region. The high mortality and morbidity that results are due in part to the fact that persons can live asymptomatically with the virus for up to 30 years; as such, testing is mostly conducted when the disease becomes chronic and liver cirrhosis is already severe. Furthermore, there is a general lack of awareness with studies showing average to poor knowledge of hepatitis B virus infection and hepatitis vaccine among persons residing in regions of high risk [8,9].

One of the effective strategies for hepatitis B management is increasing public awareness of the disease's symptoms, transmission, and prevention methods. It is assumed that increased knowledge will lead to an increase in public attitude and behavior toward hepatitis B screening and prevention, thereby lowering the prevalence of this disease in the population. Thus, the WHO has prioritized raising awareness about the disease [10, 11].

In 2020, the Hong Kong Viral Hepatitis Action Plan (HKVHAP) 2020–2024 was launched to facilitate achieving the WHO's eradication target goals by 2030. The action plan outlined three major strategies: (1) Awareness, (2) Prevention, and (3) Monitoring and implementing local efforts towards achieving the WHO's 2030 elimination target [10]. Achieving the World Health Organization's hepatitis B elimination goals requires targeted behavior-change interventions, particularly in areas of intermediate to high prevalence. Therefore, assessing the public's knowledge, attitudes, and behaviors toward hepatitis B and its vaccine is essential to identify knowledge gaps, misconceptions, and barriers to prevention and vaccination. This study aims to evaluate these factors among the Benghazi public to inform focused public health interventions and improve hepatitis B outcomes, as well as to examine their association with key demographic characteristics, including age, gender, and education level. The aim of this study is to assess gaps in knowledge, attitudes, and behaviors toward viral hepatitis among the Benghazi public and examine their association with key demographic factors, in order to inform local efforts toward achieving the World Health Organization's viral hepatitis elimination targets.

Materials and Methods

Study population and design

The current descriptive cross-sectional study was conducted from September to October 2025 across Benghazi City to assess and evaluate the knowledge, behavior, and attitude towards HepB and its vaccine targeting the general population of the Benghazi community.

Sampling

The sampling method that was used is voluntary response sampling through online questionnaires. The sample size was calculated as follows by using Cochran's Formula:

$Z^2pq \div d^2 = Ni$, Where: Z = Confidence interval 95%, p = positive prevalence 50%, q = Negative prevalence 50% , d=Marginal error 5% [12].

$(1.96)^2 (0.5) (0.5) \div (0.05)^2 = 384$

There has been no previous research on the prevalence (P) of knowledge, behavior, and attitude about HepB among the Benghazi general population. As a result, it was considered that the general population of Benghazi had 50% knowledge, behavior, and attitude concerning awareness of HepB and its vaccine.

Survey questionnaire

The study instrument was a self-administered Google form online questionnaire with 19 questions, developed through an extensive literature review in English. In addition to the demographic data, 6 questions for knowledge, 2 questions for attitude, and 4 questions for behavior. All questions are multiple-choice with a closed-ended structure. The survey questionnaire was developed in English and translated into Arabic, and the translation was validated by a linguist from the Head of Health Professional Education at Libya International Medical University. The final version of the questionnaire was reviewed through a pilot study. The questionnaire was distributed on social media via a funded advertisement trying to reach the sample size that we needed.

Study variables

Dependent variables

The response variables in this study were knowledge behavior and attitude of HepB among community members in Benghazi. A total of 6 questions were used to measure knowledge of HepB four to measure the behavior and only two for attitude. A correct response to

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KAB questions was given a score of one, whereas an incorrect response was given a score of zero.

Independent variables

The following demographic and social variables were included in this study: gender, age, level of education, marital status, and occupation. Educational level, defined as the highest level of formal education completed was classified into illiterate or primary school, preparatory school, secondary, and postgraduate. Participants' age was divided into six groups (16–19, 20–30, 31–40, 41-50, 51-60, and over 60). For occupation status, six general types were used for classification: An employee in the government sector, self-employment, student, unemployed, housewife, and medical field.

Statistical analysis

Microsoft Excel 2016 was used for data presentation, while SPSS version 28 was used for data analysis. Data were summarized as frequencies and percentages. Associations between categorical variables (knowledge, attitude, and behavior regarding HBV and its vaccine)

Scoring

Knowledge behavior and attitude were assessed using close-ended questions. Correct answers scored 1 point, whereas wrong/"do not know" answers scored 0 points. Each outcome was computed as the sum of participant responses and categorized based on Bloom's cut-off point. [16] The total score was qualified as "good" if exceeding 80% to 100% of the total score, "moderate" for scores from 60% to 75% and low for scores below 50%.[13]

Ethical approval

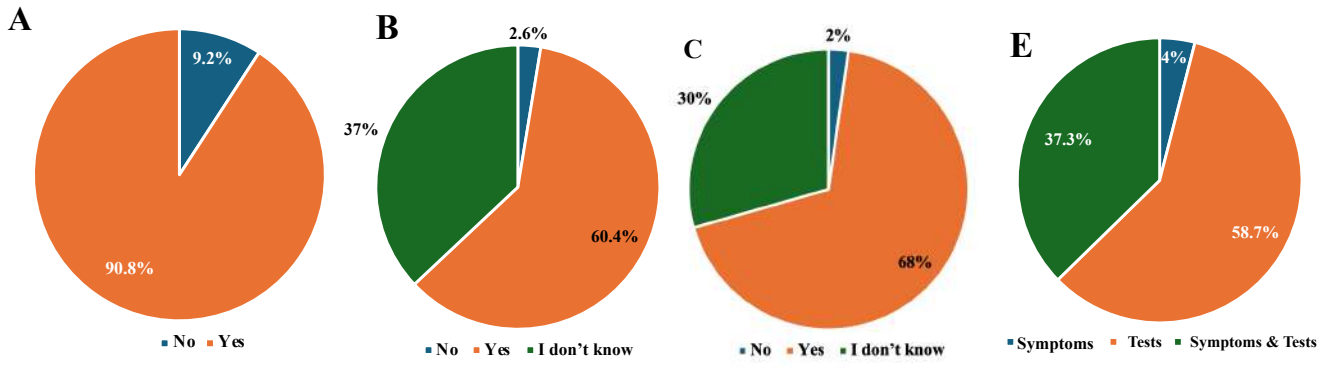
Regarding ethical considerations, ethical approval has been obtained from the Research and Consultation Center at Libyan International University.

Results

Knowledge level of the respondents on HBV

Figure 1 displays participants' knowledge regarding HepB as evaluated with questions about cause, complications class and transmission. A majority of respondents (90.8%) had heard of HepB previously, and 60.4% identified it correctly as being viral in origin, and 68.4% associated it with liver failure and chronic liver disease (Figure 1A-C). Figure 1D illustrates the knowledge regarding transmission routes, , 63% 50.8% 31.7% of the participants, recognized blood exposure unprotected, Sexual intercourse by and unsterile medical needles as corresponding mechanisms of infection respectively.

However, misconceptions persisted: 32.7% agreed that sharing food HBV carries increases the risk of HBV transmission, 8.9% considered physical contact a route of HBV transmission, 17.5% recognized proper food hygiene as a means of HBV prevention, and 30.4% incorrectly identified gloves and masks as protective measures. About 67% were aware that vaccination prevents HBV infection (Figure 1D). Approximately 67% were aware that vaccination prevents HBV infection (Figure 1F). Overall knowledge scores demonstrated that 29% had good, 42% moderate, and 29% poor knowledge as demonstrated in Figure 4.



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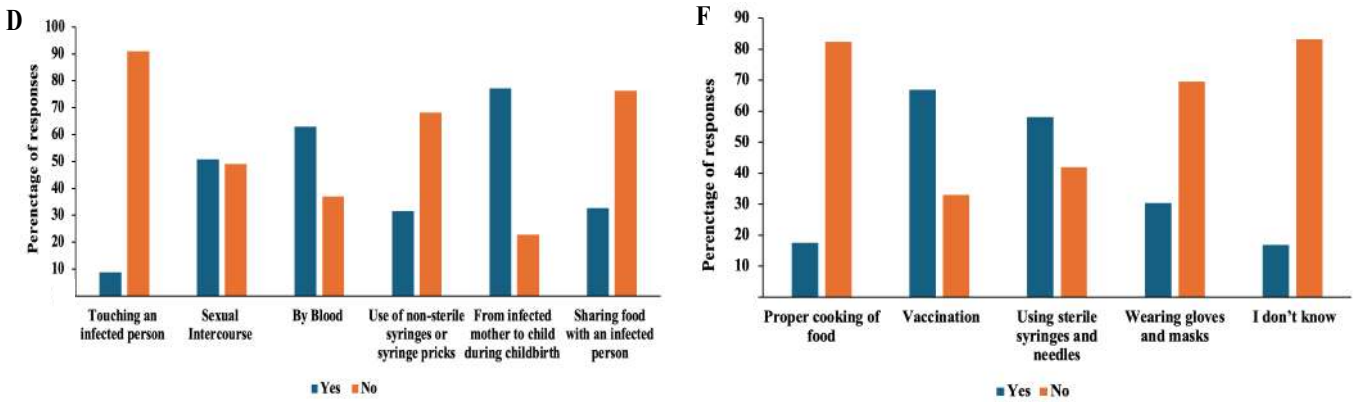

Figure 1: Participants'(n= 303) knowledge regarding HepB. (**A**) Heard about HepB previously. (**B**) knew the Viruses Causing HepB. (**C**) Knowing the association between HBV infection and liver failure and chronic liver disease. (**D**) Knowledge regarding HBV transmission routes. (**E**) Knowledge regarding HepB diagnosing. (**F**) Knowledge regarding prevention measures for HepB

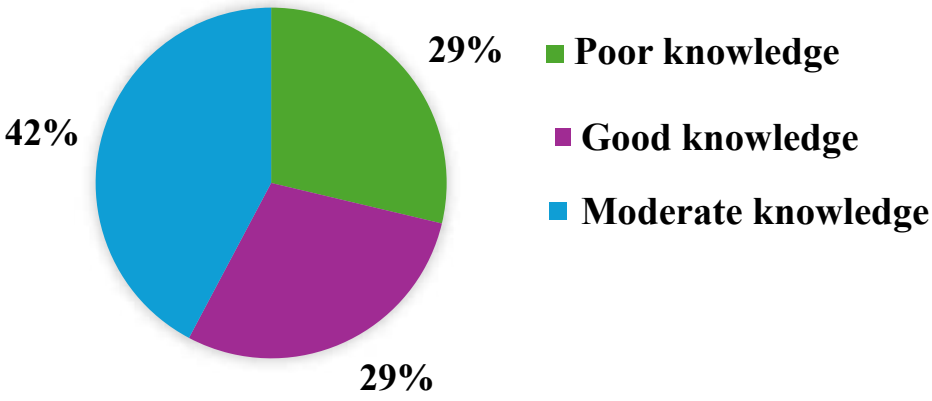

Figure 2: Participants' (n=303) score of knowledge HepB.

Attitudes towards HBV infection

Participants' attitudes toward hepatitis B and possible stigma were evaluated by asking the group how they would feel if diagnosed with the infection. 68% of respondents reported fear of disease transmission, with 33.7% indicating they will panic, 14.2% fearing death, 11.9% feeling that they will be socially exclud **Figure 2**: Participants' (n=303) score of knowledge HepB.

ed and 13.2% not caring (Figure 2A). Approximately 41.6% of respondents would go to the health facility if they suspected HBV infection; private practitioner was number one choice preferred by 62.4%, only few individuals ,1.3%, mentioned that they will not do anything (Figure 2B).

The overall attitude scores indicated that 42% of participants exhibited a positive attitude towards hepatitis B, 48% showed a moderate attitude and finally, 10% demonstrated poor attitudes (Figure 6)

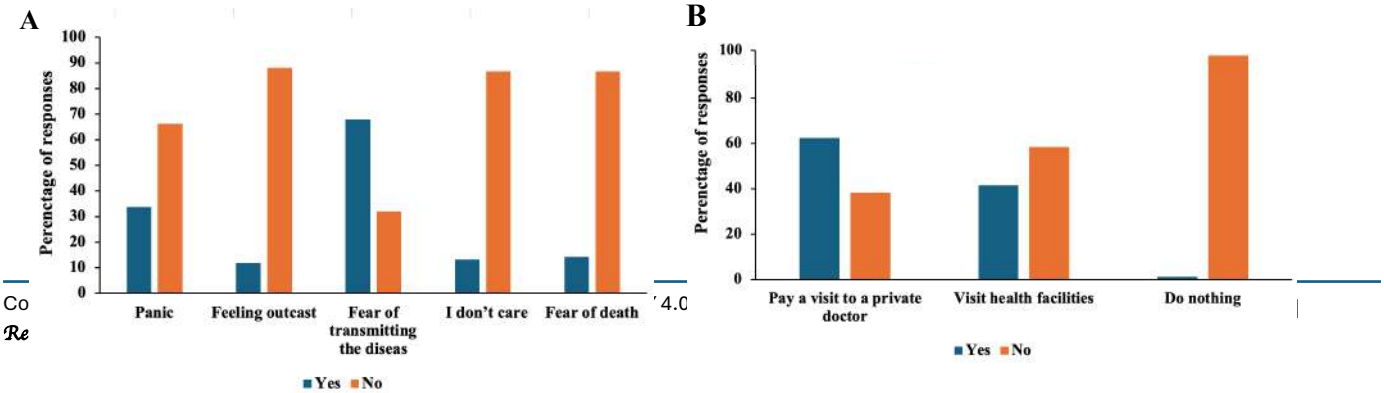

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Figure 3: Participants'(n= 303) Attitudes regarding HBV infection. (**A**) Attitudes towards being diagnosed HepB. (**B**) Attitudes towards being suspected to have HepB

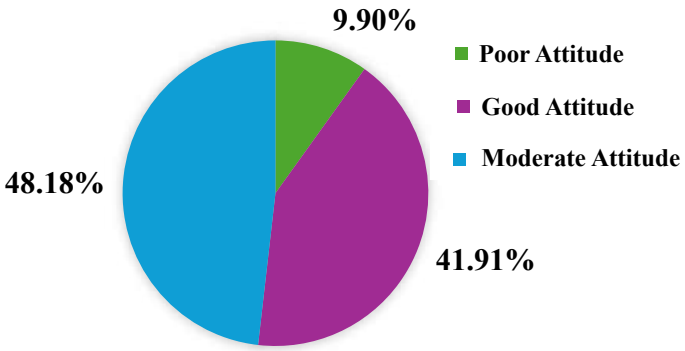
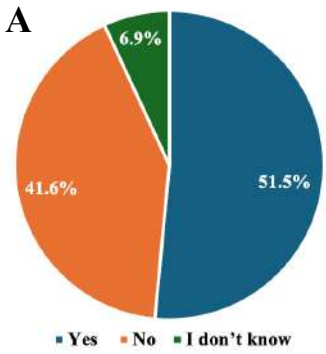


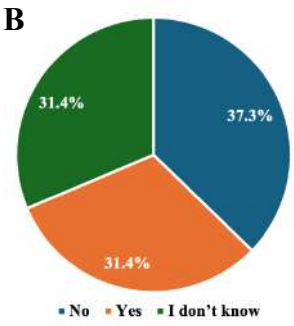
Figure 4: Participants'(n= 303) score of Attitude

Behavior Measures for HBV

Four questions were used to measure behavior toward Hep B, as shown in Figure 3. Only 31.4% of the participants had been vaccinated against HBV (Figure B), with 24.8% vaccinating as a prerequisite of a job or study (Figure 4C), and 35.6%vaccinating because of the importance of the vaccine in HepB prevention (Figure 4C)

By giving multiple situations, the participants were asked in which condition they would test, and approximately 49.5% said they would do the test if they had a needle stick injury. The results also revealed that the majority, approximately 53.1%, would do the test for hepatitis B if they had contact with an infected person, 20.8% would do it if they get a tattoo or piercing, 20.4% would test if they wanted to be pregnant, and approximately 23.1%chosen to not doing the test in any situation (Figure 3D). General behavior toward HBV was rated as poor by the majority of 64.36% respondents, with 7.26% participants exhibiting good behavior and 28.38% having moderate behavior (Figure 4).





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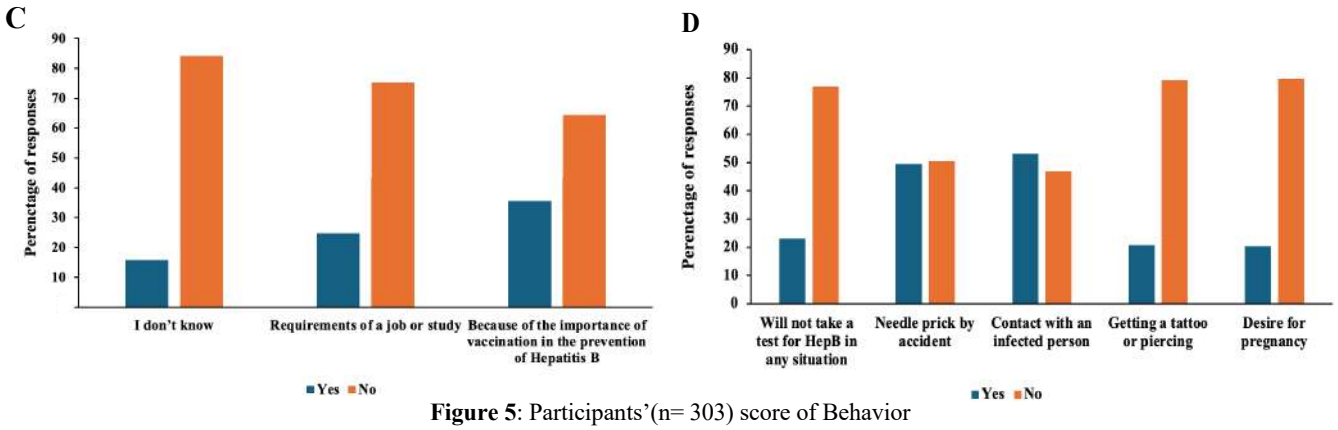

Figure 5: Participants'(n= 303) score of Behavior

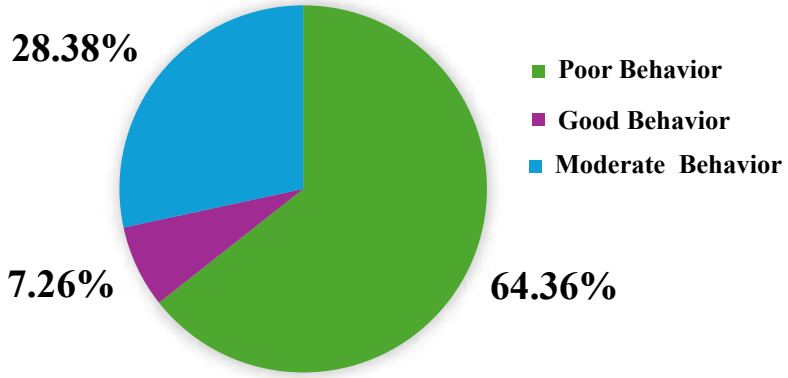

Figure 6: Participants'(n= 303) score of Behavior

Discussion

Knowledge toward HBV

The findings of this study indicate moderate knowledge of hepatitis B among participants**,** with only a minority demonstrating good knowledge. Although most respondents had previously heard about hepatitis B, fewer participants correctly identified it as a viral infection. This level of awareness is higher than that reported in Cameroon, where only a small proportion of participants recognized HBV as a virus-caused disease [14]. Despite relatively good awareness, several misconceptions about HBV transmission were identified. A considerable number of respondents believed that HBV could be transmitted through sharing food or through physical contact with infected individuals. Similar misconceptions have been reported in other studies and contribute to stigma and discrimination against infected individuals [15-20].Participants showed better knowledge regarding mother-to-child transmission, while knowledge of horizontal transmission was less adequate. Only a limited number of participants recognized that non-sterile syringes and sexual contact could transmit HBV. These findings highlight the need for public education programs addressing transmission routes and prevention strategies. Healthcare professionals and social media were the most frequently reported sources of information, suggesting strong public trust in medical professionals. Encouragingly, many participants recognized vaccination as an effective preventive measure, which is consistent with WHO recommendations that vaccination is the primary strategy for HBV prevention [10,21-23].

Attitude toward HBV

Overall, participants demonstrated generally positive attitudes toward HepB. Many respondents expressed concern about spreading the infection if diagnosed with HBV. While this reflects awareness of disease transmission, it may also contribute to social isolation or stigma**.**Social isolation has been reported among individuals with chronic diseases, including HepB, particularly in conservative societies.[24, 25] Fear of

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transmitting the infection may lead individuals to avoid social interactions.[24] Therefore, educating patients and the public about accurate transmission routes is important to reduce stigma and unnecessary social avoidance.Regarding healthcare-seeking attitudes, many respondents reported that they would seek medical care if they suspected infection, and a large proportion preferred consulting private general practitioners. These findings are higher than those reported in a Pakistani study, where substantially fewer respondents reported similar actions [24], suggesting greater trust in healthcare services and modern medical treatment among the study population.

Behavior toward HBV

Despite moderate knowledge and generally positive attitudes, preventive behavior toward HBV remained suboptimal. Many participants had never undergone hepatitis B testing, and a notable number were unaware of their infection status.

Vaccination coverage was also limited, as only a minority reported receiving the hepatitis B vaccine. Vaccination can prevent the vast majority of HBV infections and their long-term complications.[26] Highlighting the need for expanded vaccination campaigns and improved public awareness. Gender differences were also observed. Although many participants were aware of the risk of mother-to-child transmission, only a small number of women indicated that they would undergo HBV testing before pregnancy. This finding emphasizes the need for targeted education programs for women of reproductive age.

Knowledge–Attitude–Behavior relationship

The results of this study indicate that knowledge and behavioral practices were limited despite generally positive attitudes. Similar findings have been reported in other studies, suggesting that increased knowledge alone does not always translate into improved preventive behavior[27-30].Cultural beliefs, socioeconomic conditions, and stigma may influence individuals' health decisions. Therefore, effective public health strategies should combine education, vaccination programs, and stigma-reduction initiatives to support the WHO goal of eliminating hepatitis B as a public health threat .

Conclusion

The present study revealed that the general public in Benghazi demonstrated moderate knowledge and generally positive attitudes toward hepatitis B, while preventive behaviors remained limited. Several misconceptions regarding HBV transmission were identified, indicating persistent knowledge gaps within the community. In addition, vaccination coverage and screening practices were relatively low, highlighting the need for improved public health interventions.

These findings emphasize the importance of strengthening public awareness campaigns, promoting hepatitis B vaccination, and encouraging early screening and diagnosis. Educational programs should focus on correcting misconceptions about transmission, reducing stigma associated with the disease, and targeting high-risk groups, particularly women of reproductive age. Improving public knowledge and preventive practices through coordinated educational and healthcare initiatives will be essential to support national efforts and contribute to achieving the World Health Organization goal of eliminating viral hepatitis as a public health threat by 2030.

Conflicts of interest: The authors declare that they have no Conflicts of interest related to this study

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