

Assessment the knowledge and Attitude of Hepatitis B in Students of University of Karbala in Karbala Governorate

Hawraa Abd Al Abass Al Shouk^{1*}, Marwa Abed Al Abass Al Shouk²,
Zainab Abed Al Abass Al Shouk²

Author's Information

1. MBChB, FABHS-FM
Karbala Health Directorate
2. MBChB, High Diploma in Family
Medicine, Karbala Health
Directorate

Corresponding author:

Hawraa Abd Al Abass Al Shouk
drmanakhoor@gmail.com

Funding information

Self-funded

Conflict of interest

None declared by author

ABSTRACT

Background: Hepatitis B virus (HBV) infection is a large public health problem. It is the one of most common causes of chronic hepatitis, liver cirrhosis and hepatocellular carcinoma in the world, among health professionals, medical and non-medical college students are at risk.

Objectives: To determine the knowledge and attitude towards Hepatitis B virus prevention and associated factors among medical, historical college students in Karbala university in Karbala governorate.

Methods: A cross-sectional study was done that included a sample of 442 students (Karbala university in Karbala governorate). Data collection was done from 3rd January to the 28 February 2020 by a list of questionnaires given to the students who want to participate in this study.

Results: The knowledge ranged from poor to moderate knowledge or transmission of HBV good knowledge for prevention and control measures and very good knowledge for epidemiology of HBV, attitude was moderate.

Conclusions: The medical college students had more knowledge and attitude than non-medical college students.

Keywords: Hepatitis B, Knowledge, Attitude, College Students, Karbala

This article is open access published under CC BY-NC Creative Commons Attribution Non-Commercial License: This License permits users to use, reproduce, disseminate or display the article provided that the author is attributed as the original creator and that the reuse is restricted to non-commercial purposes, (research or educational use).



1. INTRODUCTION

Viral hepatitis B (HBV) is a disease condition of the liver caused by the hepatitis B virus from the Hepadnaviridae family of viruses. Hepatitis B is a highly infectious disease that inflames the liver and eventually leads to complications (1). It is considered a major public health problem worldwide particularly in healthcare institutions. The risk of occupational exposure to HBV among health care workers (HCWs), particularly students in health professions, is a major public health issue. HBV has both acute and chronic phases (2). Health care workers are considered to be at substantial risk for acquiring or transmitting the virus because of the occupational contact with blood, blood products and other body fluids. The occupational risk for HBV acquisition varies according to the work place in the health care setting and time of exposure to the agent. The practice of modern medicine has widely contributed to increasing the cases and spreading the disease in the society. HBV infection is common due to lapse in the sterilization technique of instruments or due to the im- proper hospital waste management as 10 to 20% health care waste is regarded hazardous and it may create variety of health risk (3). Medical students being part of the health care delivery system are ex- posed to the same risk as other health care workers when they come in con- tact with patients and contaminated instruments. They are the first level of contact between patients and medical care. They are expected to undertake activities related to patient care with the beginning of their clinical years. Health care workers (HCWs), especially physicians and medical students are always in direct contact with patients and are vulnerable to the acquisition of these infectious diseases during their practices. They should be aware of the risk involved in the treatment procedures and should take appropriate precautions in dealing with patients. Assessing people's knowledge is a useful step to assess the extent to which an individual or community is in a position to adopt a disease risk- free behavior for this disease (3). Medical and health 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. They are the first level of contact between patients and medical care. They are expected to undertake activities related to patient care with the beginning of their clinical years (4). A high proportion of medical students in a Saudi Arabian study showed poor knowledge

about HBV and those with good knowledge had the highest vaccination rates. Studies have shown a positive correlation between the attitudes towards HBV and mean knowledge level of hepatitis B patients and the healthy population, although many studies in various countries have been conducted, there have been very few attempts to evaluate the knowledge, attitudes and practice of Nigerian undergraduates regarding HBV (5). The spread of HBV is usually through body fluids such as blood, semen, and vaginal secretions, consequently, the likely channels for infection of HBV are sexual activity, needle-sharing or an unintentional needle-stick, blood transfusions, and organ transplantation ,infected mothers can also pass the infection to their newborns during the delivery period ,HBV cannot be transmitted by holding hands, sharing food, kissing, hugging, coughing, sneezing, or breastfeeding (6). Hepatitis B virus infection can be prevented by adhering to universal pre- cautions including the use of protective barriers like gloves, proper sterilization of medical equipment, proper hospital wastes management system and vaccination. Moreover, post-exposure prophylaxis can be used as a means of HBV prevention after accidental exposure to contaminated blood or body fluids (7). The vaccine has been available for three decades, and by 2013, it was included in the national immunization programs of 183 World Health Organization (WHO) Member States. Widespread vaccination has been shown to reduce the disease burden in several high-endemicity countries (8). In Iraq, HBV vaccination is a part of expanded program of vaccination targeting new born babies (9). For the establishment of public health plan to combat HBV infection, studying the risk factors for transmission of infection is of great importance. It is known that the major risk factors for HBV transmission are blood and transfusion of blood products, pregnancy, healthcare workers, tattoo, drug abuse, and high-risk sexual behaviors (9). Although the disease can lead to huge burden especially in endemic areas, it is preventable. Prevention is the only safe strategy against high prevalence of viral hepatitis. Having enough Knowledge and proper attitudes toward these infections are cornerstone of preventing the spread of them. Health staff and medical students have the most important role in preventing the disease by improving the disease knowledge among them and the patients because medical students are in close contact with hepatitis patients during their studying and afterwards. Because medical students who consist future health staff face the threat of percutaneous injuries with the consequent risk of contracting blood-borne infections such as hepatitis B and

C viruses, their general knowledge and attitude about viral hepatitis and its transmission and prevention can stop the spread of this disease in hospitals and society (10) . Therefore, the present study aimed to determine the knowledge and attitude towards Hepatitis B virus prevention and associated factors among medical, historical college students in Karbala university in Karbala governorate in 2020.

2. METHODOLOGY

This was a Cross-sectional study conducted at Karbala city in the Middle of Iraq included the Students of Karbala University as study population during the study period.

Sample size was calculated according to the standard equation for the cross-sectional studies at a confidence level of 95% and a degree of precision of 5%. The sample size was estimated to include 384 clients. An additional 12% was added to compensate for the non-response and the net sample size was 430. However, 442 questionnaires returned with full answers and were analyzed. Regarding the sampling technique, we used a multistage stratified random sampling method to select four colleges (2 medical and 2 historical colleges). A total of 442 students were included choosing from the 1st year of four colleges

The medical colleges (medicine and dentistry) selected randomly from all medical colleges and medical science. Non-medical colleges (engineering and education) also selected randomly from the remaining colleges (other than medical colleges). The 1st grade was chosen randomly from 6 grades.

Inclusion criteria:

The students of Karbala University of both genders and agreed to participate.

Exclusion criteria:

- Students not attended the class.
- Students not fully answered the questionnaire.

Data collection and analysis:

Data collected using a preprepared questionnaire during the period from the first of January to the end of February.

The data relevant to the study purpose obtained through a special structured validated questionnaire. The questionnaire consisted of: socio-demo- graphic data, knowledge, and

attitude. (20) The items of the questionnaires were either formulated or identified and extracted from published questionnaires, scientific literature and text book. The final instrument designed for the purpose of the study reviewed by 5 public health and internal medicine faculties from Karbala Colleges of Medicine.

Data management:

Data were entered and analyzed using the Statistical Package for Social Sciences (SPSS) IBM, US; version 23, Statistical Analysis performed accordingly; Qualitative data were presented as numbers and percentages, while continuous numerical data as mean \pm standard deviation. Numerical variables were compared using Student's t-test, while categorical variables were compared using chi-square test. Level of significance, P value of ≤ 0.05 was considered statistically significant.

Scoring:

Scores for correct answers to knowledge questions were calculated for each participant, with a scale of 1-5 for each question. For strong agreement with the correct answer; a score of 5 was given, a score of 4 for agreement with correct answer, 3 points for "I don't know", 2 points for disagreement with the correct answer, and 1 point for strong disagreement with the correct answer.

3. RESULTS

This study included a total of 442 participating students from four different colleges, 66 students were from college of medicine, forming (14.93%) of study sample, 125 from college of dentistry (28.28%), 105 from college of engineering (23.76%), and the remaining 146 from college of education (33.03%). Females formed (54.52%) of study participants while males formed the remaining (45.48%). Age of participants ranged between 18 and 25 years with a mean age of (19.39 \pm 1.21) years. Among, students (96.38%) were single, (77.15%) were of urban origin, all these findings are shown in **(Table 1)**.

Regarding knowledge, the proportion of correct answers for the questions about cause, risk factors, and complications; the questions "Hepatitis B is caused by a virus", "Hepatitis B is contagious disease", and "Hepatitis B infection can lead to liver cancer" had significantly different scores, while non-significant difference was observed regarding the remaining two questions **(Table 2)**.

Regarding the proportion of correct answers for the questions about transmission, significant differences were found regarding the spread by mosquitoes, transmission by blood transfusion, mother milk, shaking hands and sharing dishes with HBV positive patients, while the remaining questions had no significant difference (**Table 3**). The correct answers for the questions about treatment, prevention and vaccination, are summarized in (**Table 4**); significant differences in correct answers were observed between medical and non-medical groups in questions regarding prevention by good hand hygiene, antiviral therapy, diet recommendation, and the cure of the disease, ($P < 0.05$), no significant difference was found in the knowledge about presence of a vaccine for Hepatitis B, ($P > 0.05$).

The overall mean knowledge score for all participants was (76.07 ± 5.77), ranging between 61-98. Comparison of mean scores revealed no significant difference according to gender or residence, $P > 0.05$. Students of medical colleges (medicine and dentistry) had significantly higher knowledge score than students of non-medical colleges (engineering and education), P -value < 0.001 . Moreover, ANOVA test was used to compare knowledge scores among the 4 different colleges, which showed a significant difference, $P < 0.001$, however, post-hoc test was performed using Tukey method for pairwise comparisons across the colleges and revealed that students in the college of medicine had significantly the higher score than those in the college of engineering and college of education (P -value = 0.009, 0.001, respectively). Students in the college of dentistry had significantly higher score compared to college of education (P -value = 0.010). No other significant differences were observed, (**Table 5**).

The analysis of responses of the study participants about the attitude questions were detailed in (**Table 6 and Table 7**). ANOVA test showed a significant difference in attitude scores across the colleges, ($P < 0.001$), furthermore, pairwise comparisons revealed a significant difference between dentistry and each of engineering and education ($P < 0.001$) and no other significant differences had been found, (**Table 8**).

Table 1. Demographic characteristics of study participants

Variable		No.	%
College	Medicine	66	14.93
	Dentistry	125	28.28
	Engineering	105	23.76
	Education	146	33.03
Age, mean (SD) year		19.39 (1.21)	-
Gender	Male	201	45.5
	Female	241	54.5
Marital Status	Single	426	96.38
	Married, divorced, Widow	16	3.62
Residence	Urban	341	77.15
	Rural	101	22.85

Table 2. Frequency distribution of correct knowledge responses of the study participants about causes, risk factors, and complications

Question	Medical Colleges (n=191)		Non- medical colleges (n=251)		Total (n=442)		P. value
	No.	%	No.	%	No.	%	
Caused by a virus	170	89.01	179	71.31	349	78.96	<0.001*
A contagious disease	135	70.68	138	54.98	273	61.76	<0.001*
Infected person may not have symptoms	71	37.17	97	38.65	168	38.01	0.755
It can lead to cirrhosis	113	59.16	146	58.17	259	58.6	0.83
It can lead to liver cancer	66	34.55	116	46.22	182	41.18	0.044*

*Significant at P<0.05

Table 3. Frequency distribution of correct responses of the study participants toward knowledge questions about transmission and spread of HBV

Question/Item		Medical Colleges (n=191)		Non-medical colleges (n=251)		Total (n=442)		P. value
		No.	%	No.	%	No.	%	
HBV is transmitted through	Personal contact	42	21.99	43	17.13	85	19.23	0.120
	Infected mother to fetus during pregnancy	113	59.16	129	51.39	242	54.75	0.267
	Blood transfusion	162	84.82	155	61.75	317	71.72	<0.001*
	surgical or dental procedure	81	42.41	86	34.26	167	37.78	0.124
	sexual contact	63	32.98	101	40.24	164	37.10	0.190
	mother milk	39	20.42	40	15.94	79	17.87	0.014*
	sharing of unsafe needles or sharps	122	63.87	141	56.18	263	59.50	0.223
	tattoos	93	48.69	113	45.02	206	46.61	0.376
HBV can spread by	Mosquitoes	61	31.94	54	21.51	115	26.02	0.001*
	Shaking hands with an infected person	92	48.17	64	25.50	156	35.29	<0.001*
	Contaminated water/food prepared by infected person	44	23.04	39	15.54	83	18.78	0.094
	In the air on enclosed environment	47	24.61	42	16.73	89	20.14	0.112
	Sharing dishes with Hepatitis B positive patient	25	13.09	34	13.55	59	13.35	<0.001*
	Coughing & sneezing	30	15.71	27	10.76	57	12.90	0.149

*Significant at P<0.05

Table 4. Frequency distribution of correct responses of the study participants toward knowledge questions about prevention and treatment of HBV

Question	Medical Colleges (n=191)		Non-medical colleges (n=251)		Total (n=442)		P. value
	No.	%	No.	%	No.	%	
Hepatitis B infection can be prevented with good hand hygiene	93	48.69	157	62.55	250	56.56	0.002*
There is an antiviral therapy for hepatitis B	129	67.54	145	57.77	274	61.99	0.012*
Special diet is recommended for Hepatitis B	34	17.80	25	9.96	59	13.35	0.021*
There is a vaccine for Hepatitis B	138	72.25	163	64.94	301	68.10	0.258
Hepatitis B is curable/treatable	13	6.81	13	5.18	26	5.88	0.014*

*Significant at P<0.05

Table 5. Comparison of mean Knowledge scores by certain variables

Variables	Grouping	N	Mean	SD	P-value
Overall		442	76.07	5.77	-
Gender	Males	201	75.86	5.68	0.476
	Females	241	76.25	5.85	
Residence	Urban	341	76	5.79	0.653
	Rural	101	76.3	5.74	
Study field	Medical	191	77.4	6.01	<0.001*
	Non-medical	251	75.06	5.38	
College	Medicine	66	78.17	5.62	<0.001*
	Dentistry	125	77	6.19	
	Engineering	105	75.35	5.23	
	Education	146	74.84	5.49	
Post-hoc Pairwise comparison according to college					
Medicine vs. Dentistry					0.528
Medicine vs. Engineering					0.009*
Medicine vs. Education					0.001*
Dentistry vs. Engineering					0.125
Dentistry vs. Education					0.010*
Engineering vs. Education					0.895

*Significant at P<0.05

Table 6. Frequency distribution of responses of the study participants toward attitude questions (1 - 8)

Question	Group	Strongly agree	Agree	Don't know	Disagree	Strongly disagree	P. value
Instrument sterilization is important to prevent transmission	Medical	99	66	20	5	1	0.019*
	Non- medical	107	79	57	6	2	
Wearing gloves is important to prevent transmission	Medical	54	73	42	20	2	0.259
	Non- medical	53	90	72	31	5	
Vaccination could prevent transmission	Medical	49	77	53	11	1	0.781
	Non- medical	68	95	71	17	0	
Everyone should get HBV vaccination	Medical	75	70	32	14	0	0.042*
	Non- medical	76	88	59	22	6	
I think that HBV is essential to prevent transmission	Medical	67	76	39	6	3	0.116
	Non- medical	79	79	75	12	6	
Asking for new syringe before an injection	Medical	105	49	31	5	1	<0.001*
	Non- medical	68	89	81	8	5	
Discard material in contact with blood and body fluids after treatment of patient	Medical	54	28	52	28	29	<0.001*
	Non- medical	44	54	102	38	13	
I am not at risk, so I do not need HBV vaccination	Medical	17	26	38	63	47	<0.001*
	Non- medical	36	50	76	56	33	

Table7. Frequency distribution of responses of the study participants toward attitude questions (9-16)

Question	Group	Strongly agree	Agree	Don't know	Disagree	Strongly disagree	P. value
I'm always careful so don't need HBV vaccination	Medical	25	25	31	67	43	<0.001*
	Non- medical	40	47	72	60	32	
Ask the barber to change razor for haircut	Medical	86	47	43	11	4	0.063
	Non- medical	80	71	79	14	7	
Choose clean food premise	Medical	115	57	17	1	1	<0.001*
	Non- medical	111	71	60	7	2	
Ask whether the blood had screened before blood transfusion	Medical	93	54	38	4	2	0.329
	Non- medical	105	68	65	11	2	
Spread the information regarding HBV to family and friend	Medical	75	60	42	8	6	0.312
	Non- medical	84	81	70	13	3	
Avoid meeting HBV patient	Medical	59	72	40	18	2	0.336
	Non- medical	69	81	65	29	7	
Like to get screened for HBV	Medical	60	72	40	15	4	0.814
	Non- medical	73	91	62	17	8	
Like to get further investigation and treatment if found positive HBV without any symptoms	Medical	78	56	41	13	3	0.044*
	Non- medical	77	78	78	10	8	

Table 8. Attitude scores by college

College	N	Mean score	SD	P-value
Medicine	66	60.08	7.23	<0.001*
Dentistry	125	62.08	6.83	
Engineering	105	57.99	7.85	
Education	146	58.38	6.88	
Total	442	59.59	7.33	
Post-hoc Pairwise comparison according to college				
Medicine vs. Dentistry				0.256
Medicine vs. Engineering				0.249
Medicine vs. Education				0.383
Dentistry vs. Engineering				<0.001*
Dentistry vs. Education				<0.001*
Engineering vs. Education				0.973

*Significant

4. DISCUSSION

Hepatitis B virus (HBV) is a major health problem globally. Only HBV and HCV have been studied in Iraq, Karbala City located about 100 km south of Baghdad, is one of the cities that attract refugees after 2003. The increasing population density in Karbala City is the main cause of the spread of different diseases (11). Since 2014, the prevalence of HBV has been steadily increased because the high migration to Karbala due to ISIS attack in some north-cities of Iraq, leads to the inability of the health sector to cover all people with vaccination (11). The present study tried to assess the knowledge and attitude towards Hepatitis B virus prevention and associated factors among medical and non-medical college students in Karbala university in Karbala governorate in 2020. The age of students ranged between 18 and 25 with a mean of (19.39 ± 1.21) years which is less than that in India (12), Egypt (13), Ghana (14) and Saudi Arabia (15), the lowest mean age for medical students and high mean age for educational students and male higher mean age than female. The females more participate in this study more than the male which is opposed to study in Iraq (3), Ethiopia (16) and (10), due to the

females more than males in medicine, dentistry and education colleges. The most participate were singles, either male or female, then married, like a study in Ethiopia (16) then divorced, and similar to the participation of the medical students of Saudi Arabia (15). Most of participations were of urban area and this is similar to what found in study in Baghdad 2017 (17) and different from those participated in the study done in Egypt 2013, where most of them were of rural region (18) and Ethiopia (16). There was a statistically significant relationship between residence and college, more than half of rural residents were in the college of education. No statistically significant difference was found in knowledge scores across the sex or marital state of the participants, while in a previous study conducted by Mansour-Ghanaei et al. (10), females were more knowledgeable than males. From other point of view, the knowledge the students in this study regarding the mode of transmission was generally disappointing. However, in this study, there is a significant difference in the knowledge of medical and non-medical students with more knowledge in medical students. Similarly, other studies showed a significant relationship between medical groups and knowledge scores: nurses were more knowledgeable than other groups. Richmond also reported that doctors were the most knowledgeable group (10), because they are riskier to exposure to HBV infection than others, so they taking care of HBV infection and information. In our study, 78.96% of students know that hepatitis B is caused by a virus, 61.76% of students know that hepatitis B virus is contagious, 54.75% of students know that hepatitis B virus can be vertically transmitted, which is higher than a previous Iraqi study conducted in Baghdad (17), Vietnam (19) and north India (12) while lower than that in other Indian study (20) and Ethiopia (16). Almost 55% of our students know that the hepatitis B virus is transmitted by blood transfusion, this is regarded good percent in compare to that found in Baghdad in 2017 (17) and north India (12) and less than that reported in Erbil (3), India (20) and Ethiopia (16). In the present study, only 37.1% of the participants know that hepatitis B transmitted by sexual contact, and this is close to the findings of a previous Iraqi study in Baghdad 2017 (17) but less than that reported in Erbil/ Iraq (3), Vietnam (19), India (20) and Ethiopia study (16) and higher than other study in north India (12). We found that 59.5% of the students know that hepatitis B virus is transmitted by unsafe needles, which is higher than that found in Baghdad study 2017 (17) and in north India (12) but lower than that in Erbil (3), India (20) and Ethiopia (16).

Unfortunately only 18.78% of the students know that hepatitis B virus is not transmitted by contaminated water/food prepared by infected person, which is not varied from the findings of the Iraqi study done in Baghdad (17) but is less than that found in Erbil (3), Vietnam (19) and Ethiopia (16), this may be due to the inclusion of t students in the first grade who did not have good information or lectures about HBV. In the present study, only 13.35% of students know that hepatitis B virus is not transmitted by sharing infected dishes, this proportion is lower than that reported in Baghdad in 2017 (17). We found that 46.61% of students know that hepatitis B virus is transmitted by tattoo, which is different from the study in Baghdad (17). About 35.29% of students in this study know that shaking hands not transmitted the disease, and this percent is much less than the percentage reported in Iraq/ Erbil (3) and Vietnam (19). More than half, 56.56%, of the students knew that HBV can cause liver cancer which is similar to the Vietnamese students (19) this indicates that our students did not understand the seriousness of the HBV disease. About 58.60% know that HBV can lead to liver cirrhosis which is less than that in Ethiopia (16) About 56.56% know that HBV can cause liver cancer, which less than that found in Erbil (3). Only 5.88% know that HBV is curable/treatable which is less than that of Erbil (3) and Ethiopia(16). About 68.1% know that there is vaccine for HBV which is less than that of Ethiopia(16). Only 12.90% know that HBV not transmitted by cough which is less than the study in Erbil (3). About 38.01% know that asymptomatic patient can transmitted the infection which is less than that of Erbil (3). In the present study the difference in the knowledge score among the four colleges was significant, $P < 0.001$, with a highest mean knowledge score for the medical students, followed by dentistry student which consistent with the findings of Maroof et al. in North Indian (12), the engineering and then the educational students showed the least mean score of knowledge. The highest knowledge of students that HBV is caused by a virus, and the lowest knowledge that HBV is curable / treatable. In all questions the medical students have correct answers more than historical students except the knowledge of HBV transmission by sexual contact, the person can be infected with HBV without symptoms, HBV can lead to liver cancer and HBV can be prevented by good hand hygiene, in which the historical students have more correct answers, and nearly equal in knowledge of sharing dishes of HBV infected patient can spread the infection due to non-medical students answer the questions by chance or may have information from net., TV.

and others, even medical students of 1st grade not have good information about HBV. This study showed a great difference in knowledge scores among different colleges. This may be due to lack of standard educational programs. About 75.92% of medical students and 65.43% of non-medical students, 70.675% of all students know that everyone should have HBV vaccination which is less than that of Vietnamese 97.9% (19).

5. CONCLUSIONS

The overall knowledge of the included medical and non-medical specialty students was poor to moderate regarding the mode of transmission and people who are at risk to have the disease, good for the prevention and control measures and very good for the disease epidemiology. The medical college students showed higher knowledge scores than non-medical college students. The clinical management scored the lowest and the natural history scored the highest. Hence, we recommend establishing educational seminars, programs and workshops for medical and non-medical specialty students to increase their knowledge and attitude regarding Hepatitis B. However, further studies are highly suggested for more precise assessment particularly with larger sample size at multiple centers and universities.

Ethical Approval:

All ethical issues were approved by the author. Data collection and patients enrollment were in accordance with Declaration of Helsinki of World Medical Association, 2013 for the ethical principles of researches involving human. Signed informed consent was obtained from each participant and data were kept confidentially.

6. BIBLIOGRAPHY

1. Aniaku JK, Amedonu EK, Fusheini A. *Assessment of Knowledge, Attitude and Vaccination Status of Hepatitis B among Nursing Training Students in Ho, Ghana. Ann Glob Health. 2019;85(1).*
2. Al Wutayd O, AlRehaili A, AlSafrani K, Abalkhail A, AlEidi SM. *Current Knowledge, Attitudes, and Practice of Medical Students Regarding the Risk of Hepatitis B Virus Infection and Control Measures at Qassim University. Open Access Maced J Med Sci. 2019;7(3):435-9.*
3. Othman SM, Saleh AM, Shabila NPJESJ. *Knowledge about hepatitis B infection among medical students in Erbil city, Iraq. 2013.*
4. Mesfin YM, Kibret KTJPo. *Assessment of knowledge and practice towards hepatitis B among medical and health science students in Haramaya University, Ethiopia. 2013;8(11):e79642.*

5. Amorha KC, Chiebue MI, Ayogu EE, Ukoha-Kalu OB, Okonta MJ. Knowledge, Attitudes and Practice of Undergraduate Students in University of Nigeria Enugu campus (UNEC) towards Hepatitis B.
6. Alhowaish MA, Alhowaish JA, Alanazi YH, Alshammari MM, Alshammari MS, Alshamari NG, et al. Knowledge, attitudes and practices toward prevention of hepatitis B virus infection among medical students at Northern Border University, Arar, Kingdom of Saudi Arabia. 2017;9(9):5388.
7. Abdela A, Woldu B, Haile K, Mathewos B, Deressa TJB. Assessment of knowledge, attitudes and practices toward prevention of hepatitis B virus infection among students of medicine and health sciences in Northwest Ethiopia. 2016;9(1):410.
8. Choudhuri G, Ojha R, Negi T, Gupta V, Saxena S, Choudhuri A, et al. A school-based intervention of screening a movie to increase hepatitis B vaccination levels among students in Uttar Pradesh, India: impact on knowledge, awareness, attitudes and vaccination levels. 2017;2(1):10.
9. N RH. Risk factors of hepatitis B virus infection among blood donors in Duhok city, Kurdistan Region, Iraq. *Caspian J Intern Med*. 2018;9(1):22-6.
10. Mansour-Ghanaei R, Joukar F, Souti F, Atrkar-Roushan ZIJ. *medicine e*. Knowledge and attitude of medical science students toward hepatitis B and C infections. 2013;6(3):197.
11. Merzah MA, Mohammed A, Hassan Al-Aaragi AN, Salim M. Epidemiology of Viral Hepatitis from 2007 to 2016 in Karbala Governorate, Iraq. *J Res Health Sci*. 2019;19(2):e00445.
12. Maroof KA, Bansal R, Parashar P, Sartaj AJJ-JotPMA. Do the medical, dental and nursing students of first year know about hepatitis B? A study from a university of North India. 2012;62(1):25.
13. Atlam SA, Elsabagh HM, Shehab NSJJ. *JoRiMS*. Knowledge, attitude and practice of Tanta University medical students towards hepatitis B and C. 2016;4(3):749-56.
14. DONKOR AG. Knowledge and Attitude Towards Hepatitis B Virus Infection Among Adults in Tamale in the Northern Region of Ghana: a Descriptive study: Ankara Yıldırım Beyazıt Üniversitesi Sağlık Bilimleri Enstitüsü; 2019.
15. Mubarak MG, Alamir SA, Qohal MM, Alamir OH, Quadri MFJT. *joedp*. Relation between Knowledge, Attitude and Practice of Hepatitis B among Dental Undergraduates in the Kingdom of Saudi Arabia. 2019;20(12):1447-55.
16. Kassa TB, Bantie GM, Begosew AM. Knowledge, Attitude and Practice towards Hepatitis B Virus Prevention and its Associated Factors among Private Medical/Health Sciences College Students, Bahir Dar, Ethiopia. 2019.
17. Thabit MF, Ali MH, AL-Bahadeli NMJMMJ. Knowledge about hepatitis B infection among undergraduate medical and health college Students, Baghdad. 2017;16(2):63-7.

18. *Abd El-Nasser GJKJfNS. Assessment of students knowledge and attitude toward hepatitis B and C in Sohag University/Egypt. 2013;3(1):1-14.*
19. *Dahlström E, Funegård Viberg E. Knowledge about hepatitis B virus infection and attitudes towards hepatitis B virus vaccination among Vietnamese university students in Ho Chi Minh City:–A quantitative study. 2013.*
20. *Singh A, Jain SJH. Prevention of hepatitis B; knowledge and practices among medical students. 2011;2(2):8-11.*

Citation:

Al Shouk H.A, Al Shouk M.A, Al Shouk Z.A Assessment The Knowledge and Attitude of Hepatitis B In Students of University of Karbala in Karbala Governorate. AJMS 2025; 11 (1):79-95