

KNOWLEDGE AND PRACTICE OF HEPATITIS B PREVENTION AMONG HEALTHY POPULATION IN COMMUNITY

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Abstract

Introduction: Hepatitis B (HB) is a serious global public health problem.

The aim of this study was to evaluate knowledge of transmission and practice (KAP) towards hepatitis B (HBV) among healthy population in R. N. Macedonia.

Methods: A cross-sectional study was undertaken. Six hundred healthy individuals (aged 18 years and older) were included in the study. Descriptive statistics was conducted using frequencies and proportions. Unadjusted odds ratios (OR) and their 95% confidence intervals (CI) were used as indicators of the strength of association. A p-value of 0.05 or less was used as a cut-off level for statistical significance. All analyses were performed using SPSS 20.0 Statistical program. Internal consistency was assessed by using Cronbach's alpha ($\alpha = 0.78$) and was found to be in acceptable ranges.

Results: Majority of participants (39.7%) were in the age group 40 - 49 years; 65.3% were female; 46.8% were with university degree; 72.2% were married; 92.2% came from an urban area; 76.7% were employed and 67.7% were with moderate monthly income. In terms of knowledge about the mode of transmission, the majority of respondents, i.e. participants in the study showed a moderate level of knowledge - 56.6% points (50% -75% points). Poor knowledge was evident in the answers to the questions related to the transmission by piercing (tattoo) -48.3% and to the question related to transmission by cocaine sniffing - 21.0 %. A correct answer in the study that showed a good level of knowledge was given to i.v. drug use - 87.2%.

Conclusion: The positive linear correlations have reaffirmed that better knowledge of transmission can lead to positive prevention and subsequently to good practices. This will further help in prevention and management. Therefore, extensive health educational campaign should be provided to general population.

Keywords: knowledge, transmission, practice, hepatitis B, healthy population

Introduction

Hepatitis may well be considered as a silent epidemic of the modern world. It is a highly infectious disease which is 50-100 times more contagious than HIV^[1,2]. Hepatitis B is a potentially life-threatening liver infection caused by the hepatitis B virus (HBV). It is a major global health problem. It can cause chronic infection and put people at high risk of death from cirrhosis and liver cancer^[1,3].

The hepatitis B virus (HBV), discovered in 1966, infects more than 350 million people worldwide^[4]. Hepatitis B virus is a leading cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma, accounting for 1 million deaths annually.

The disease can be transmitted via direct or indirect modes of cross-infection. HBV has been detected in blood, saliva, semen, and other body secretions and fluids. HBV is contagious and easy to be transmitted from one infected individual to another by blood-to-blood contact. The virus is spread by direct contact with the blood, serum, or sexual fluids of an infected person. This can happen by sharing needles or having unprotected sexual contact with a hepatitis B patient, sharing of eating utensils and other barber shop and beauty salon equipment^[4]. Infected women can pass the virus to their babies. Other, less frequent causes of infection include household contact, hemodialysis, transmission from a surgeon, and receipt of organs or blood products^[4,5]. Immigration, cheap air travel, and globalization are all factors contributing to a worldwide spread of hepatitis B virus^[4,6].

Prevention is the only safeguard against epidemic of viral hepatitis B. Knowing facts and having proper attitudes and behaviors are critical to prevent the spread of these infections. How can hepatitis B be prevented? A vaccine against HBV has been available since 1982, which is 95% effective in preventing HBV infection and its chronic consequences, including liver cancer. Universal HBV vaccination programs for infants, with first dose at birth, have been highly effective in reducing the incidence and prevalence of hepatitis B in many countries^[7].

The WHO recommends HBV vaccination, first in 1981 to high-risk individuals, then in 1991 all newborns and in 1995 adolescents.

By 2017, 49 of the 53 countries in the WHO European Region conducted universal HBV vaccination, but only 26 vaccinated all newborns, while the other 23 started vaccination at the age of 2 months or later.

Vaccination of adults, who are at high risk for HBV infection, including health care workers, can prevent transmission of HBV. A safe and effective vaccine against HBV is available since 20 years and is effective in preventing infection and the serious consequences of hepatitis including liver cancer and cirrhosis when given before or after exposure^[8,9].

The hepatitis B vaccines have been introduced into the program in Macedonia in 2004. All newborns receive three doses: 12 hours after birth, first revaccination after 1-2 months and second revaccination after 6 months.

Blood safety strategies, including quality-assured screening of all donated blood and blood components used for transfusion, safe injection practices and eliminating unnecessary and unsafe injections, can also protect against HBV transmission.

Safer sex practices, including minimizing the number of partners and using barrier protective measures (condoms), also protect against transmission.

Knowledge is usually assessed to see how far community knowledge corresponds to biomedical concepts^[8,10]. Practices in KAP surveys usually inquire about preventive measures or different health care options. Normally, hypothetical questions are asked, so it permits statements about actual practices, rather, it yields information on people's behaviors or on what they know should be done^[8,11].

Aim. To assess the knowledge and practice for prevention of hepatitis B, to determine the level of knowledge and practice of general population regarding HBV and its transmission and prevention.

Methodology

This is a cross-sectional study, and the time period is not limited. The estimated sample size for this study was 600 participants, adult individuals. Inclusion criteria for this study were: residents of the Republic of North Macedonia, older than 18 years, healthy,

receiving no medications, not mentally and physically handicapped, and voluntary participation. They were interviewed with a KAP questionnaire. The questionnaire was used to collect information about the socio-demographic characteristics of respondents, knowledge towards transmission and prevention method of hepatitis B virus and practice towards HBV prevention. A translated English version of the questionnaire was used for collection information from respondents.

Prevention against any disease is proportional to knowledge, attitude and practice (KAP) of the population and reflection of the importance that is paid to health-related issue by the society.

Categorical variables were measured as percentages while continuous variables were expressed as mean \pm standard deviation. Knowledge and practice of participants about prevention of hepatitis B virus (HBV) were considered as dependent variables and the independent variables were age, sex, place of living, and marital status of the study population. The results were statistically analyzed using the Chi-square test.

Data were checked for completeness and consistency. Coded data were analyzed using the Statistical program SPSS, version 20.0 (SPSS, Chicago, IL, USA). Bivariate and multivariate analyses were carried out using logistic regression to examine and evaluate the relationship between the outcome variable and selected socio-demographic variables that were independently associated with HBV knowledge as well as HBV vaccine uptake. Unadjusted odds ratios (OR) and their 95% confidence intervals (CI) were used as indicators of the strength of association. A p-value of 0.05 or less was used as a cut-off level for statistical significance. Internal consistency was assessed by using Cronbach's alpha ($\alpha = 0.7$) and was found to be in acceptable ranges.

Results

Table 1 shows detailed demographic characteristics of respondents. The majority of participants (39.7%) were in the age group 40 - 49 years, and 392 (65.3%) of respondents were females, with M:F ratio about 1:1.9. The majority, 281 (46.8%), were with a university degree; 72.2% were married; 92.2% came from an urban area; 76.7% were employed and 67.7% were with moderate monthly income (Table 1). The mean age was 36.4 years (SD \pm 9.9), and the median age was 38 (IQR: 28 to 43) years.

Table 1. Characteristics of the study participants

Age-years	N	%
<=29	178	29.7
30 – 39	137	22.8
40 – 49	238	39.7
>-50	47	7.8
gender		
male	208	34.7
female	392	65.3
education		
elementary	8	1.3
high	266	44.3
higher	45	7.5
university	281	46.8
place of residence		
urban	553	92.2
rural	47	7.8
marital status		
no	167	27.8
yes	433	72.2
employment status		

employed	460	76.7
unemployed	42	7.0
student	98	16.3
monthly income		
low	74	12.3
moderate	406	67.7
high	58	9.7
Does not want to share this information / I do not know	62	10.3

Table 2 gives details of the transmitted knowledge questions and the percentage of the correct answers. Nearly 89% of the total participants were aware that hepatitis B infection is caused by a virus and majority (96%) responded that it was the disease of the liver. To the question "Have you heard of hepatitis B?" (Q1) 89.0% of respondents answered positively - YES (have heard about it before the study), and 66 (11.0%) respondents had not heard about hepatitis B. A correct answer, correct information to the question "Hepatitis B causes" virus gave 83.7% of respondents, and 16.3% thought it was a bacterium; the percentage difference was statistically significant for $p < 0.05$ ($p = 0.000000$) (Table 2).

Table 2. Knowledge about HBV and mode of transmission (Q1-Q17)

<i>Q1 Have you heard of Hepatitis B</i>	<i>N</i>	<i>%</i>
yes	534	89.0
no	66	11.0
<i>Q2 Hepatitis B causes</i>		
virus/correct	502	83.7
bacteria/incorrect	98	16.3
<i>Q3 Transfusion of infected blood and blood product</i>		
correct	444	74.0
incorrect	65	10.8
I do not know	91	15.2
<i>Q4 Surgery</i>		
correct	355	59.2
incorrect	95	15.8
I do not know	150	25.0
<i>Q5 Gynecological intervention</i>		
correct	316	52.6
incorrect	148	24.7
I do not know	136	22.7
<i>Q6 Dental intervention</i>		
correct	355	59.2
incorrect	46	7.7
I do not know	199	33.2
<i>Q7 tattoo</i>		
correct	397	66.2
incorrect	48	8.0
I do not know	155	25.8
<i>Q 8 piercing</i>		
correct	290	48.3
incorrect	48	8.0
I do not know	262	43.7
<i>Q9 i.v. drug use</i>		
correct	523	87.2
incorrect	18	3.0
I do not know	59	9.8
<i>Q10 cocaine sniffing</i>		
correct	126	21.0
incorrect	331	55.2

I do not know	143	23.8
Q11 hemodialysis		
correct	327	54.5
incorrect	161	26.8
I do not know	112	18.7
Q12 hemophilia		
correct	344	57.3
incorrect	41	6.8
I do not know	215	35.8
Q13 hygiene habits - using common utensils to maintain personal hygiene		
correct	399	66.5
incorrect	31	5.2
I do not know	170	28.3
Q14 often changing sexual partner		
correct	308	51.3
incorrect	173	28.8
I do not know	119	19.8
Q 15 contaminated syringes and needles		
correct	450	75.0
incorrect	99	16.5
I do not know	51	8.5
Q 16 from a positive mother to a child		
correct	303	50.5
incorrect	67	11.2
I do not know	230	38.3
Q 17 through unsafe sex		
correct	406	67.7
incorrect	109	18.2
I do not know	85	14.2

The correct answers 89%, 87.2%, 83.7%, 81.5% were the highest given to questions 1, 2, and 9, respectively.

The profile of those who gave the correct answer regarding the cause of hepatitis B (that it is a virus) were women (65.3%), aged 40 to 49 years (42.8%), of Macedonian nationality, with completed higher education (52.8%), 92.8% lived in urban areas, 74.3% were married, 79.2% were employed and had a moderate monthly income (68.9%).

In terms of knowledge about the mode of transmission, the majority of respondents, i.e. participants in the study showed a moderate level of knowledge - 56.6% (50% -75%). Poor knowledge was evident in the answers to the questions related to transmission question 8 (piercing - 48.3%) and to transmission question 10 (cocaine sniffing - 21.0%). A correct answer in the study that showed a good level of knowledge was given regarding i.v. drug use - 87.2% (Q 9).

The transmission by blood and blood products (74%), needles and sharps (75%), unprotected sex (67.7%) showed a moderate knowledge level.

The largest percentage (74.0%) of respondents answered correctly that it HBV was transmitted through transfusion of infected blood and blood derivatives with HBV, and 16.7% of respondents answered that it was not the transmission mode, whereas 15.0% did not know the answer.

The knowledge of respondents about the transmission of HBV through surgical, gynecological and dental interventions (if the basic hygienic measures are not maintained) ranged from 59.2% for surgical and dental to 52.6% for gynecological intervention. In the range of 7.6% to 24.7%, respondents considered that surgical, gynecological and dental interventions (if the basic hygienic measures are not maintained) was not a possible mode of transmission. Respondents rated the transmission of HBV through piercing or tattoo from

48.3% to 66.2%. Ignorance and negation of piercing and tattoo placement as a possible mode of transmission ranged between 51.7% (negative answer - 8.0% and 43.7% know) to 33.8% (negative answer - 8.0% and 25.8% know). On the knowledge of the population at risk, more than half of the respondents (54.5%) knew that hemodialysis was a therapeutic method and its implementation can cause transmission of HBV. 57.3% of respondents gave the correct answer that hemophilia, when blood and blood products are received, could be a possible transmission mode of HBV.

Half of the respondents (51.3%) knew that frequent change of sexual partner was a risky behavior and 67.7% of respondents knew that unsafe sex was a risk for HBV transmission. 66.5% of respondents knew that hygienic habits - using common utensils to maintain personal hygiene (for shaving, for dental hygiene - toothbrushes, for injecting drugs) could be a transmission mode of HBV.

Perinatal and sexual transmissions of HBV were recognized by 52% and 51% of respondents (Table 2).

The relationship between demographic characteristics gender *versus* knowledge of transmission was not significantly associated. A significant association was found between the age - younger, higher education level, place of living and higher knowledge of HBV transmission (Pearson Chi-square: 36.2026, $p=0.000003$; Pearson Chi-square: 32.5689; $p=0.000013$; Pearson Chi-square: 10.5484, $p=0.005122$).

Respondents older than 40 years showed almost twice [OR = 1.8894 (95% CI 1.1799—3.0255); OR=2.2381 (95% CI 1.4626—3.4247); OR = 2.4193 (95% CI 1.6871—3.4693)] more knowledge of transmission through surgery, gynecological and dental intervention than respondents under 40 years of age.

Higher education was shown to be the strongest predictor of good knowledge of transmission through hemodialysis and hemophilia, surgery, gynecological and dental intervention,

Living in a urban areas was a predictive factor for good knowledge of transmission, which showed four and a half times (OR = 4.6442 95% CI: 1.5761-13.6848) more knowledge than that of respondents living in rural areas in terms of transmission through the use of i.v. drugs.

Practices towards HB prevention were assessed by asking three questions as shown in Table 3. It can be seen that the majority (76.3%) of respondents had knowledge about the presence of HBV vaccines, while 20.5% did not have and 3.2% did not know about available vaccines. The percentage of the correct answer *versus* the other two modalities was significant for $p < 0.05$.

Table 3. Distribution of respondents according to hepatitis B-related practice

Q18 Is there a vaccine for HBV	N	%
correct	458	76.3
incorrect	123	20.5
I do not know	19	3.2
Q19 have you ever been tested for HBV		
no	539	89.8
yes	61	10.2
Q20 have you been vaccinated		
yes	31	5.2
no	294	49.0
I do not know	275	45.8
Q21 Do you believe that vaccination could prevent transmission?		
yes	490	81.7
no	110	18.3

The majority of respondents (89.8%) have never been screened for HB and 49.0% stated a negative immunized status against HB.

A vast majority of participants (81.7%) reported that vaccination was an important protective measure.

Out of 600 participants, 5.2% were vaccinated against HBV, which was a significantly small percentage. In the vaccinated group, 64.5% completed all 3 doses of their vaccination schedule and the remaining 35.5% were incompletely vaccinated. Figure 1 shows reasons given for not being vaccinated. Reasons for not getting vaccinated were lack of information - 132 (44.9%) participants, no need was felt by 29 (9.9%) participants, 45 (15.3%) had fear of injection and 88 (29.9%) showed ignorance, but the major reason for not taking the vaccine was that they were not aware of it (58.3%) (Figure 1).

This study showed significant positive but weak linear correlations between knowledge of transmission and practice ($r = 0.173$, $p = 0.02$). The result reaffirmed the relationship between knowledge of transmission and practice with preventive measures even though the correlation was weak in this study. It can be concluded that adequate knowledge transmission can lead to good practices.

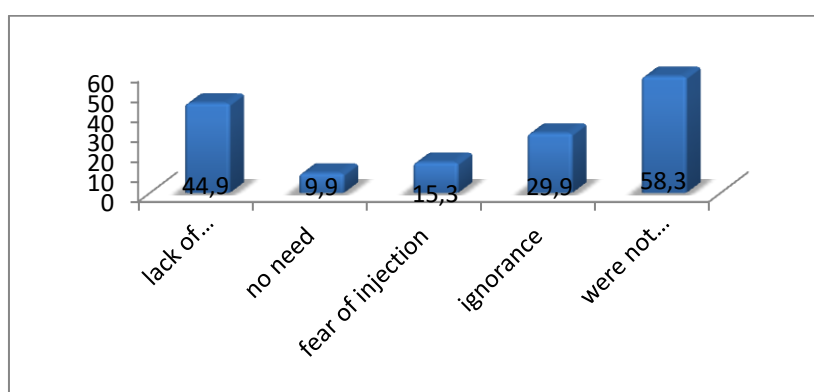


Fig. 1. Reasons for not taking hepatitis B vaccine

In the multivariate logistic regression model, the predictors of good knowledge of HBV transmission were age < 40 years, education, previous HBsAg test and complete immunization with HBV vaccine

Discussion

Hepatitis B infection is one of the major health problems worldwide causing health problems to the infected and an enormous burden on the health care system. HBV is an important cause of liver cancer and liver cirrhosis and is likely to persist as an important health issue resulting in substantial mortality and morbidity for many years to come, particularly in developing countries^[12-14].

In our study, in terms of knowledge about the mode of transmission, the majority of respondents, i.e. participants in the study showed a moderate level of knowledge - 56.6%, which was opposite to the investigation in Northern Nigeria^[12]. In the studies conducted in Ethiopia and Kuwait the percentages were 52.0% and 57.7%, respectively^[15,16]. However, the answers to some questions revealed a gap in knowledge. For example, poor knowledge was evident in the answers to the questions related to the transmission question 8 (piercing – 48.3%) and question 10 (cocaine sniffing – 21.0%). A correct answer in the study that showed a good level of knowledge was given to i.v. drug use – 87.2% (Q 9).

More than 74% and 75% of respondents in this study correctly mentioned that HBV can be transmitted through contaminated blood, which was similar to other studies from

Morocco, Sudan and Nigeria^[12-19]; there was a good knowledge of blood as a medium of transmission of infection.

In a study conducted in northern Nigeria, 21.0% thought that the virus cannot be transmitted through sexual intercourse, and in our study it was 18.2%^[12]. However, studies in Egypt have shown that HBV can be transmitted through sexual route^[20,21]. The data was in concordance with a study in France where about 70% of French respondents reported that hepatitis B could be transmitted sexually. Similar findings were observed in other European studies: 63% and 78%, respectively, in Germany and the Netherlands^[22].

Area of residence (locality) was a significant factor associated with KAP scores. However, the extensive literature review detected no studies reporting the relation of locality and KAP. In our study, we found a statistically significant association between knowledge of transmission and residence of living. Cheung *et al.* and Wu *et al.*, however, reported the education level as a significant factor associated with KAP in their study participants^[23,24].

There was a poor level of knowledge about hepatitis B prevention and transmission in the study by Gebrecherkos *et al.*^[25]. The level of education was significant only in the study by Saquib *et al.*^[26,27].

In the study by Fufore Mohammed Bello *et al.*^[12] there was no relationship between practice and total knowledge of way of transmission of HBV. In our study, we found significant positive but weak linear correlations between knowledge of transmission and practice.

Majority of respondents knew that the virus can be effectively prevented with vaccination - 81.7%. However, 20.5% of respondents claimed that there was no vaccine available for HBV. This large gap in knowledge should be bridged as a matter of urgency.

A total of 89.8% of respondents did not know their HBV status and only 5.2% of had received HB vaccine (low vaccination coverage in our study). Despite having awareness regarding the availability of HB vaccines, the majority of participants were not immunized against HB. The proportion of respondents that have ever been screened for HBV infection was particularly low. Similarly, the lack of knowledge among the general population that may be HB positive and did not know their status could potentially expose their loved ones to the risk of infection disease.

Furthermore, only 64.5% completed all 3 doses of their vaccination schedule. Similar findings were reported in other investigations^[12,28,29], while some have reported slightly higher level of vaccination^[17,30,31]. Similar results were reported from Pakistan^[32] and from Iran^[20], where participants reported to have poor practices which were directly related to the knowledge and awareness regarding HB infection.

A good knowledge about HBV virus and modes of infection as well as adequate vaccination may reduce the infection rate.

Shalaby *et al.* in Egypt reported that participants had adequate knowledge towards transmission, vaccination of HB^[33]. Possible reasons that can be attributed to this difference of response are demographic variation of the study population, study location as well as the study tool used for data collection.

Our observations were in concordance with the two studies^[34,35], which stated that those who were highly educated were more aware of HBV infection, its transmission and prevention.

Conclusions

Summarizing the results of this study has indicated a lack of understanding of the basics of infection control and prevention of HBV transmission. The findings suggest that there is a gap in knowledge of transmission and preventive measures among general population. Extensive health education campaign should be provided to general population

and especially to the residents of rural areas. There should be an increased awareness through campaigns geared towards educating general population about the dangers of HBV.

The strength of this study is that, to our knowledge, this is the first study conducted on general population in R. N. Macedonia that assessed the knowledge of transmission and practice and preventive measures for HBV. Furthermore, information obtained from this survey may contribute to scientific knowledge of transmission and practice and preventive measures about HBV among general population, and also add to future research on this health issue.

Conflict of interest statement. None declared.

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