

## Knowledge, Attitude and Preventive Measures regarding Hepatitis B among Adolescents contacting Outpatient Pediatric Clinics

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### ABSTRACT

Hepatitis B infection is a serious health problem worldwide. Prevention of this disease with its fatal consequences depends greatly on the level of adolescents' knowledge, attitudes and preventive measures about it. **Aim:** This study aimed to assess the knowledge, attitude and preventive measures regarding hepatitis B among adolescents contacting Pediatric Outpatient Clinics of Tanta University hospitals, Egypt. **Setting:** The study was carried out at Outpatients Pediatric Clinics of Tanta University Hospitals. **Sampling:** A purposive sample of all adolescents contacting the pediatric clinic from June - July 2016 and willing to participate in the study were included. Their number was 100 adolescents and their ages ranged from 12-18 years. **Research design:** A descriptive design was used. **Results:** The majority of the studied subjects had educated parents, about three fourth of them had unsatisfactory knowledge regarding hepatitis B definition, management and the family constitute the main sources of knowledge to 39% of them. About one third of the studied subjects who had unsatisfactory score of the total knowledge were males (29%) and had none employed parents (father 35% & mother 44%). Regarding the subjects' attitude, three fourth of them ; realize that hepatitis B is an infectious disease and half of them also accept to make a check up for hepatitis B. One third of the studied subjects' who had unsatisfactory attitude to hepatitis B infection were males and had none employed parents, compared to only one fifth of female subjects. Regarding subjects' preventive measures, about one third of male subjects had unsatisfactory preventive measures score regarding hepatitis B and had none employed parents. **Conclusion:** More than three fourth of the studied subjects had unsatisfactory knowledge about hepatitis B definition and management and have unsatisfactory attitude to hepatitis B and do unsatisfactory measures when dealing with hepatitis B infected persons. **Recommendations:** Educational and health promotion programs should be conducted to increase the level of knowledge, attitudes and preventive measures regarding Hepatitis B among the adolescents.

**Key words:** Knowledge, attitude, preventive measures, hepatitis B and adolescents.

#### Introduction

Hepatitis B infection is a major public health problem worldwide. It is the tenth leading cause of death globally and one of the most important infectious diseases affecting all countries, especially in

developing countries (Abeje & Azage 2015; Oyewusi, Okanlawon, & Ndikom, 2015). Worldwide two-billion people are estimated to be infected with hepatitis B virus (HBV) and about 360–400 million people are chronically infected (Ogoina, Pondei, Adetunji, Chima, and Isichei, 2014). In

Egypt, there are nearly 2-3 million chronic carriers of hepatitis B (Salama, Sami, Salama, Said, and Rabah, 2013). Adolescents are thought to be at risk for HBV because of their high-risk behaviors. It places adolescents at increased risk of significant health problems (Sami, Salama, Elmosalami, Abdel-Latif, and Abdel Hamid, 2015). The consequences of infection with HBV in adolescents continue to create a severe health problem that is potentially fatal. Approximately 650,000 die each year from cirrhosis and hepatocellular carcinoma due to chronic infection and 130,000 from acute HB (Schweitzer, Horn, Mikolajczyk, Krause, and Ott, 2015).

Adolescents are subject to most of the same illnesses as other age groups within the population. However, they are much less likely to recognize symptoms, and much more likely to underestimate the effective preventive measures. In addition, they usually do not know where to go for help. As a result, adolescents are the least likely section of the population to go for early treatment (WHO, 2002). Hepatitis B infection is a serious blood-borne disease, caused by the hepatitis B virus (HBV) which attacks the liver (Al- Gashanin & Mostafa, 2013). HBV is a deoxyribonucleic acid (DNA) virus that is transmitted primarily through blood (percutaneous and permucosal routes). It has been found in blood, saliva, semen, and vaginal secretions and can be transmitted through mucous membranes and breaks in the skin. HBV is also transferred from carrier mothers to their babies at birth and during close contact afterward (Smeltzer, Bare, Hinkle, and Cheever, 2010). Adolescence may engage in intentional or unintentional risk behaviors that can lead to significant consequences, complicating their future health (Salem, Al Shazaly, Salama, and Elseidy, 2015). High-risk behaviors such as injection drug use, cocaine snuffing, unprotected sexual practices, tattooing, and body piercing are common among adolescents. These practices place adolescents at an increased risk of

contracting hepatitis B infection (Sami, Salama, Elmosalami, Abdel-Latif, and Abdel Hamid, 2015).

Nurses play a key role in the prevention of HBV infection; together with the society, they are responsible for initiating and supporting activities that enhance a population's health and social needs (International Council of Nurses, 2012). Pediatric nurses have a critical role in the prevention efforts in both public health and school health when it comes to inhibiting the spread of HBV by disseminating information on preventive measures, which based on the understanding the knowledge among adolescents concerning hepatitis B infection through teaching about preventive measures regarding HBV infection, adolescents and their families education and promotion of vaccines and screening tests; moreover, explaining the importance of early detection and diagnosis, proper treatment and follow up (Dahlström & Viberg, 2013).

#### **Magnitude of the problem:**

The adolescence age is a critical and vital age, but faces complete neglect from health team services. The silent killer hepatitis B, though represents major threat to health globally. Adolescents are a huge and vulnerable group of infectious diseases which they suffer and die from complications of the disease daily, so it is important to understand their knowledge about hepatitis B, their attitude and their preventive measures to protect them from disease transmission, maintain their health and wellbeing of their families.

#### **Aim of the study:**

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This study aimed to assess knowledge, attitude and preventive measures regarding Hepatitis B among adolescents contacting Outpatient Pediatric Clinics of Tanta University Hospitals, Egypt.

## Subjects and Methods:

### Research hypothesis:

1. There is a significant relation between subjects' knowledge, attitude, hepatitis B preventive measures and their parents' education & employment.
2. There is a significant difference in knowledge, attitude and preventive measures regarding hepatitis B infection among male and female subjects.

**Type of the study:** It is a cross sectional study.

**Design:** A descriptive design was used.

**Sample:** A purposive sample of all adolescents contacting Outpatient Pediatric Clinics, from June - July 2016. The criteria of the study inclusion; adolescents from both genders, aged from 12 to 18 years and willing to participate in the study their number was 100 adolescents. Exclusion criteria; adolescent whom not complete the questionnaire, or not willing to participate in the study.

**Setting:** The study was carried out at Outpatients Pediatric Clinics of Tanta University hospitals, Tanta City, Al Gharbia governorate, Egypt.

**Tool:** Based on review of relevant literature and many validated questionnaires, the researchers developed a questionnaire sheet to cover the study aim and included 4 parts as follow;

- a. Part one: Concerned with subjects' socio-demographic variables.
- b. Part two: It had 22 statements which illustrate adolescents' knowledge about hepatitis B as; definition, causes, methods of transmission, manifestations, prevention, vaccinations, management,

complications and most common sources of their knowledge. Each subject was instructed to choose only one response for each question; correct answer was given a score of "1", wrong or not sure answers were given a score of zero. The attained scores of each subject were graded as "Unsatisfactory" if the total correct answer scores <50%; "Satisfactory" if the total correct answer scores 50% -75% and "Good" if the total correct answer scores were >75%.

- c. Part three: It had 9 statements to investigate adolescents' attitude toward hepatitis B. Positive attitude was given one score, but negative attitude were given zero. The attained scores were summed unsatisfactory attitude when the total score of positive attitude items <50%, satisfactory attitude when total score of positive attitude items 50-75% and good attitude which means that total score of positive attitude items > 75%.
- d. Part four: Concerned with 7 statements to assess adolescents' preventive measures related to hepatitis B. There were 2 possible responses to each statement, study subjects were instructed to choose only one response for each question; the responses were yes or no. Each correct preventive measure was given a score of "1", while wrong measures were given a score of "0". The attained scores were graded as "Unsatisfactory" if the total scores were <50% of correct measures; "Satisfactory" if the total scores of correct measures were from 50%-75% and "Good" if the total scores of correct measures were >75%. The reliability and validity of the questionnaire were tested by an assistant professor of medical-surgical nursing and a professor of public health medicine.

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### **Ethical considerations:**

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Permission to conduct the study was obtained from the study administrative authorities. All subjects were informed that participation in the study was voluntary, no name was included in the questionnaire sheet. Anonymity and confidentiality of participants were respected and protected. Confidentiality was assured and subjects were informed they have the rights to refuse to participate in the study or withdrawal at any time.

**Pilot study:** It was carried out on 5 male and 5 female adolescents to test the clarity and simplicity of the questionnaire. Necessary modifications were done post pilot study. Adolescents who participated in the pilot study were excluded later from the main study sample.

### **Procedure:**

- A review of local and international related literature was carried out to get acquainted with the various aspects of the research problem and the study tool.
- All adolescents contacting outpatient pediatric clinics from June - July 2016 from 9 - 1 o'clock each Saturday &

Tuesday and willing to participate in the study were included in the study.

- The researchers sit with each subject individually before contact with the clinic doctor to provide them with an idea about the study aim.
- After that researchers take a written consent from subjects whom willing to participate to be included in the study. Each subject take 50 minutes to fill out the questionnaire sheet. The researchers answer each subject' questions during filling the questionnaire sheet. post filling the questinnaire the researchers receive only the completed questionnaires.

### **Statistical analysis:**

- Statistical analysis was done using the SPSS program version 19. Results were presented as the frequencies and percentage. The Chi-square test was used to determine if the data were normally distributed. Person correlation analysis was used to test the significance between subjects' sociodemographic variables and their knowledge, attitude and hepatitis B preventive measures. Statistical differences were considered significant at  $p < 0.05$ .

**Results:**

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Table 1: Distribution of the Studied Subjects' Socio demographic Variables.

Socio-demographic variables :	No	%
1) Adolescent age in years:		
12-	49	49.0
14-	27	27.0
16-18	24	24.0
2) Adolescent education:		
Preparatory .	58	58.0
Secondary.	25	25.0
University.	17	17.0
3) Father education:		
Educated	74	74.0
Not educated.	26	26.0
4) Father has employment:		
Yes.	40	40.0
No.	60	60.0
5) Mother education:		
Educated	60	60.0
Not educated.	40	40.0
6) Mother has employment:		
Yes .	17	17.0
No.	83	83.0

Regarding table 1; the majority of subjects aged less than sixteen years (76%), were in preparatory stage (58%), had educated parents (fathers 74% & mothers, 60%) and had none employed parents (fathers 60% & mothers 83%).

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Table 2: Distribution of the Studied Subjects' Knowledge regarding Hepatitis B.

Items of knowledge	No	%
1) Definition: <ul style="list-style-type: none"> <li>• Unsatisfactory.</li> <li>• Satisfactory.</li> <li>• Good.</li> </ul>	79 17 4	79.0 17.0 4.0
2) Causes: <ul style="list-style-type: none"> <li>• Unsatisfactory.</li> <li>• Satisfactory.</li> <li>• Good.</li> </ul>	42 48 10	42.0 48.0 10.0
3) Methods of transmission <ul style="list-style-type: none"> <li>• Unsatisfactory.</li> <li>• Satisfactory.</li> <li>• Good.</li> </ul>	44 42 14	44.0 42.0 14.0
4) Manifestations. <ul style="list-style-type: none"> <li>• Unsatisfactory.</li> <li>• Satisfactory.</li> <li>• Good.</li> </ul>	46 44 10	46.0 44.0 10.0
5) Hepatitis B prevention: <ul style="list-style-type: none"> <li>• Unsatisfactory.</li> <li>• Satisfactory.</li> <li>• Good.</li> </ul>	64 20 16	64.0 20.0 16.0
6) Vaccination. <ul style="list-style-type: none"> <li>• Un satisfactory.</li> <li>• Satisfactory.</li> <li>• Good.</li> </ul>	47 40 13	47.0 40.0 13.0
7) Management <ul style="list-style-type: none"> <li>• Unsatisfactory.</li> <li>• Satisfactory.</li> <li>• Good.</li> </ul>	73 23 4	73.0 23.0 4.0
8) Complications. <ul style="list-style-type: none"> <li>• Unsatisfactory.</li> <li>• Satisfactory.</li> <li>• Good.</li> </ul>	41 37 22	41.0 37.0 22.0
9) Sources of adolescents' knowledge. <ul style="list-style-type: none"> <li>• Family</li> <li>• Friends</li> <li>• Books</li> <li>• No.</li> </ul>	39 11 14 36	39.0 11.0 14.0 36.0

It was clear from table 2 that; the majority of subjects had unsatisfactory knowledge score regarding hepatitis B definition (79%), its prevention (64%) & management (73%) and the family constituted the main sources of knowledge to more than one third of them (39 %).

Table 3: Correlation of Subject Socio demographic Variables and Total Score of Knowledge about Hepatitis B.

Socio-demographic Variables	Study Subjects Total Knowledge Score						X2	P
	Unsatisfactory		Satisfactory		Good.			
	No	%	No	%	No	%		
1) Adolescent age in years: 12- 14- 16-	23 12 13	23.0 12.0 13.0	15 7 7	15.0 7.0 7.0	11 8 4	11.0 8.0 4.0	1.346	.854
2) Adolescent sex : Male. Female.	29 19	29.0 19.0	14 15	14.0 15.0	7 16	7.0 16.0	5.630	.050*
3) Adolescent education: Preparatory. Secondary. University.	32 10 6	32.0 10.0 6.0	16 7 6	16.0 7.0 6.0	10 8 5	10.0 8.0 5.0	3.828	.430
4) Father education: Educated Not educated.	22 21	22.0 21.0	25 4	25.0 4.0	27 1	27.0 1.0	39.167	.000*
7) Father has employment: Yes. No.	13 35	13.0 35.0	12 17	12.0 17.0	16 7	16.0 7.0	13.777	.008*
5) Mother education: Educated Not educated.	15 33	15.0 33.0	24 5	24.0 5.0	21 2	21.0 2.0	32.181	.000*
6) Mother has employment: Yes . No.	4 44	4.0 44.0	4 25	4.0 25.0	9 14	9.0 14.0	10.750	.005*

\*Significant

As clear from table 3; about one third of subjects with unsatisfactory total knowledge score were males (29%), in preparatory stage (32%) & had none employed father (35%) and had none employed mother (44 %).

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Table 4: Distribution of the Studied Subjects' Attitude to Hepatitis B.

Attitude items	No	%
Hepatitis B is an infectious disease. Yes.	73	73.0
No.	27	27.0
Vaccination prevent the disease. Yes.	48	48.0
No.	52	52.0
Accept to contact with infected person. Yes.	36	36.0
No.	64	64.0
Accept to eat & drink with an infected person. Yes.	27.0	27.0
No.	73.0	73.0
The hepatitis B patient should be isolated to prevent infection. Yes.	32	32.0
No.	68	68.0
Accept to make a check up for hepatitis B Yes.	51	51.0
No.	49	49.0
You accept to vaccinate against Hepatitis B. Yes.	67	67.0
No.	33	33.0
If you infected with Hepatitis B you will take treatment. Yes.	76	76.0
No.	24	24.0
Accept to marry Hepatitis B patient. Yes.	25	25.0
No.	75	75.0

About three fourth of the studied subjects agree that hepatitis B is an infectious disease (73%), 64% refuse to contact with hepatitis B patients and 73%, refuse to eat & drink with the infected person. Only 51% of subjects accept to make checkup for hepatitis B, 76% of them agree to take treatment if they were infected with Hepatitis B virus but 75% refuse to marry Hepatitis B patients.

Table 5; Correlation of Subject Socio demographic Variables and Attitude to Hepatitis B.

Socio-demographic variables	Subjects Attitude to Hepatitis B .						X <sup>2</sup>	P
	Unsatisfactory		Satisfactory		Good.			
	No	%	No	%	No	%		
1) Adolescent age in years: 12- 14- 16-	25 12 9	25.0 12.0 9.0	14 5 10	14.0 5.0 10.0	10 10 5	10.0 10.0 5.0	5.158	.271
2) Adolescent sex : Male. Female.	30 16	30.0 16.0	12 17	12.0 17.0	8 17	8.0 17.0	8.363	.015*
3) Adolescent education: Preparatory. Secondary. University.	33 9 4	33.0 9.0 4.0	17 5 7	17.0 5.0 7.0	8 11 6	8.0 11.0 6.0	12.720	.013*
4) Father education: Yes. No.	23 20	23.0 20.0	25 5	25.0 5.0	26 1	26.0 1.0	14.749	.001*
8) Father has employment: Yes . No.	10 36	10.0 36.0	14 15	14.0 15.0	16 9	16.0 9.0	13.219	.001*
5) Mother education: Yes . No.	15 31	15.0 31.0	22 7	22.0 7.0	23 2	23.0 2.0	28.087	.000*
6) Mother has employment: Yes . No.	3 43	3.0 43.0	4 25	4.0 25.0	10 15	10.0 15.0	13.164	.001*

\*Significant

Regarding table 5; about one third of the studied subjects with unsatisfactory attitude regarding hepatitis B infection were males (30%) in preparatory stage (33%) and had none employed parents (fathers 36% and mothers 43%) with significant differences were found regarding all items.

Table 6: Studied Subjects' Preventive Measures regarding Hepatitis B.

Items of preventive measures	No	%
1. Regularly do screening for Hepatitis B. Yes. No.	44 56	44.0 56.0
2. Try to vaccinate against Hepatitis B. Yes. No.	44 56	44.0 56.0
3. Use a new syringe at any time of injection. Yes. No.	51 49	51.0 49.0
4. Any one use your personal cloths. Yes. No.	13 87	13.0 87.0
5. Any one use your hygienic tools. Yes. No.	40 60	40.0 60.0
6. Use gloves while dressing others' wounds. Yes. No.	39 61	39.0 61.0
7. Wash their wound immediately. Yes. No.	34 66	34.0 66.0

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As clear from table 6, more than half of the studied subjects were not subjected regularly to screening for Hepatitis B, were not trying to vaccinate against hepatitis B, didn't use gloves while dressing others' wounds and also not wash their wound immediately when they were wounded by sharp objects.

Table7: Correlation of Subjects' Socio-demographic Variables & Preventive Measures.

Socio-demographic variables.	Hepatitis B Preventive Measures						X <sup>2</sup>	P
	Unsatisfactory		Satisfactory		Good			
	No	%	No	%	No	%		
1) Adolescent age in years: 12- 14- 16-	28 11 11	28.0 11.0 11.0	11 8 6	11.0 8.0 6.0	10 8 7	10.0 8.0 7.0	2.217	.696
2) Adolescent sex : Male. Female.	32 18	32.0 18.0	10 15	10.0 15.0	8 17	8.0 17.0	8.160	.017*
3) Adolescent education: Preparatory. Secondary. University.	35 9 6	35.0 9.0 6.0	14 6 5	14.0 6.0 5.0	9 10 6	9.0 10.0 6.0	8.173	.085
4) Father education Yes.  No.	23 2	23.0 2.0	22 3	22.0 3.0	29 21	29.0 21.0	13.410	.001*
5) Father has employment Yes.  No.	12 38	12.0 38.0	13 12	13.0 12.0	15 10	15.0 10.0	11.000	.004*
6) MotherEducation: Yes.  No.	18 32	18.0 32.0	20 5	20.0 5.0	22 3	22.0 3.0	24.333	.000*
7) Mother has employment: Yes.  No.	4 46	4.0 46.0	5 20	5.0 20.0	8 17	8.0 17.0	7.016	.030*

\*Significant

Table 7 illustrates that about one third of male subjects (32%) had unsatisfactory total measures score regarding hepatitis B preventive measures. Regarding parents' education, 29 % of them had educated father and did good preventive measures regarding hepatitis B. Also 32% of them had none educated mothers and do unsatisfactory preventive measures regarding hepatitis B. Also, more than one third of subjects who had unemployed parents had unsatisfactory measures to prevent hepatitis B with a significant difference to all items.

## Discussion

Hepatitis B is a public health threat in Egypt, which needs understanding of adolescents' knowledge, attitude and measures to prevent the disease transmission between them (Rang, Chakraborty, Sarker, and Tripura, 2015). This study aimed to assess knowledge, attitude and preventive measures regarding hepatitis B among adolescents contacting outpatient pediatric clinics of Tanta University hospital. The majority of studied subjects had an unsatisfactory knowledge score regarding hepatitis B definition, prevention and management. Also more than one third of them had unsatisfactory knowledge regarding hepatitis B causes, transmission methods and the family constitute the main sources of knowledge to them as clear from table 2. Regarding table 3; about one third of subjects with unsatisfactory total knowledge scores were males, in the preparatory stage and had none employed parents.

The current study finding supported by Hwang, Huang, & Yiin, 2010 who found that women were more likely to have a greater knowledge about hepatitis B than men. Also, Yau, Ford, Kwan, Chan, and Choo, 2016 found that 53% of subjects were aware of the effective hepatitis B treatment and Bladh & Ohlson in 2015 found that more than 50% of the students had poor knowledge about hepatitis B. Regarding Bui, Leduc, Nguyen, Nguyen, and Trinh, 2013 studied subjects, they lacked knowledge about the disease transmission and treatment methods. At the same point of view, Al-Gashanin & Mostafa in 2013; found deficiencies in knowledge regarding hepatitis B transmission among secondary school male students. The current finding is congruent with Sami, Salama, Elmosalami, Abdel-Latif, and Abdel Hamid, 2015 who found that female students have better knowledge about hepatitis B than the male students. Similarly, [Ahmad, Munn Sann, and Abdul Rahman, 2016](#) found that female had better knowledge than male subjects. Also Chireh, in 2011

found that the majority of subjects were not knowledgeable about hepatitis causes and modes of virus transmission and Satekge in 2010 found that knowledge of 52.9% of subjects was incorrect about hepatitis prevention. Regarding Wei, Mak, Lim, Aung, and Wong in 2007, they reported that parents were the most influential sources of knowledge of the subjects. Also Thaver & Kamal in 2010 found that only 52% of subjects had correct knowledge about symptoms, causes and hepatitis B prevention measures and parents represent as 57% of sources of subjects' knowledge.

Regarding studied subjects' attitude to hepatitis B in table 4 three fourth of them consider it as an infectious disease, they refuse to eat and drink with infected persons also more than half of them accept to make a check up for hepatitis B and agree to take treatment if they are infected. Regarding marriage, three fourth of them refuse to marry hepatitis B patients. According to the present study findings, in table 5 one third of male subjects who had unsatisfactory attitude to hepatitis B infection were in the preparatory stage and had none employed parents. [Ahmad, Munn Sann, and Abdul Rahman, 2016](#) support the current study finding where they found that the subjects' attitudes towards hepatitis B were low. Al-Gashanin, & Mostafa in 2013 reported that the attitude of 43.7% of students was unsatisfactory, while a good attitude was expressed only by 4.3% of them and they found that 13.9% of male subjects accept to marry hepatitis B infected wives. Chireh in 2011 found 78% of urban adolescents will ask for screening of blood before transfusion compared to 68% of rural adolescents and 69% of urban adolescents were ready to be vaccinated against HBV. Al-Jabri, Al-Adawi, Al-Abri, and Al-Dhahry in 2004 also found misconceptions about hepatitis B between male subjects which reflects a false perception of the disease among them.

Table 6 reflects studied subjects' preventive measures; more than half of them

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did not do screening for Hepatitis B regularly, were not trying to vaccinate against the disease, didn't use gloves while dressing others' wounds and also not wash their wound immediately. Also, as clear from table 7, about one third of male subjects had unsatisfactory total preventive measures score regarding hepatitis B. Regarding subjects' parents employment, more than one third of them had unemployed parents and do unsatisfactory preventive measures toward hepatitis B. This finding supported by Al-Gashanin & Mostafa in 2013 who found that only 21% of subjects avoided using a syringe that has been used before, only 27.4% knew that it is necessary to thoroughly wash a wound after being injured by a sharp object and only one third of them used gloves while dealing with any sharp objects. Also 43.7% of students expressed unsatisfactory practices for prevention of hepatitis B. While good preventive measures were expressed by only 8% of them and they added that only 21% avoid using a syringe that has been used before. Therefore, the current findings reflect a significant relation between a subjects' total score of knowledge, attitude, preventive measures and their parents' education and employment; so the first research hypothesis accepted. Regarding the studied subjects' sex, there is a significant difference in total score of knowledge, attitude and preventive measures regarding hepatitis B infection among male and female subjects; so the 2<sup>nd</sup> research hypothesis was accepted totally.

### **Conclusion:**

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Based on the results of this study, it can be concluded that about two thirds of the studied subjects lack correct knowledge about important aspects of hepatitis B, at least one third of them had the unsatisfactory attitude to hepatitis B and had also unsatisfactory preventive measures against hepatitis B infection. Families constitute the first source of knowledge to the studied subjects. So the families, especially mothers who are in contact with their adolescents most of the time had a great role to improve

their awareness about hepatitis B, change their attitude and improve their preventive measures for hepatitis B.

### **Recommendations:**

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From the study results, it is recommended that:

- An advanced educational program should be conducted to all adolescents in all settings to raise their awareness about the disease.
- Screening of all adolescents regarding their immune status against hepatitis B and administering the vaccine to those who prove susceptible.
- Health authorities should carry out a compulsory vaccination program to all adolescents who were born before the HBV vaccine introduction in Egypt.
- Screening test to all pregnant women should be conducted to prevent the vertical transmission of the virus from infected mothers to their newborn during labor.

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