



## Prevalence and Vaccination Status of Hepatitis B among Healthcare Workers in Allied Hospital of Faisalabad: A Cross-Sectional Study, 2017-18

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**Citation:** Iqbal M, Rakhia A, Ahmed Raza F, Ambreen A, Anwar O. Prevalence and Vaccination Status of Hepatitis B among Healthcare Workers in Allied Hospital of Faisalabad: A Cross-Sectional Study, 2017-18. JOHE 2019; 8(4):185-9.

### Article Info

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#### Article history

Received: Dec 2019

Accepted: June 2020

doi 10.29252/johe.8.4.185

Print ISSN: 2251-8096

Online ISSN: 2252-0902

Peer review under responsibility of Journal of Occupational Health and Epidemiology

### Abstract

**Background:** The vaccination status of HCWs working in Pakistani hospitals against the hepatitis B virus is poorly known. This study aims to assess the vaccination status of hepatitis B among HCWs in Allied Hospital of Faisalabad.

**Materials & Methods:** This cross-sectional study was conducted from July 2017 to June 2018. Two groups of HCWs were included in the study. Group 1 consisted of doctors and nurses at different wards of the hospital, and group 2 included final year undergraduate and nursing students. A predesigned form was administered to record information regarding their demographic characteristics and history of vaccination. Next, about 5ml of blood was taken from each participant to check HBsAg. Data were entered and analyzed in SPSS V16.0 by descriptive statistics and the chi-square test.

**Results:** From total 300 HCWs, 222 (74%) HCWs were female and 78 (26%) of them were male. The age of the participants was between 20-25. In addition, 135 (45%) HCWs were fully vaccinated, 36 (12%) HCWs were partially vaccinated, and 129 (43%) HCWs were never vaccinated against hepatitis B. 59.7% of vaccination cases were found in doctors followed by 49.2% and 26.9% in students and nurses, respectively. The major reason for not being vaccinated was lack of time in 93 (63.7%) HCWs.

**Conclusion:** Despite existing recommendations and higher prevalence rates of hepatitis B in high-risk groups, about 40% of the HCWs were not vaccinated either due to unawareness or carelessness.

**Keywords:** Healthcare Workers, Hepatitis B Virus, Hepatitis B Surface Antigen

### Introduction

Hepatitis B is a virus that attacks the liver, which results in acute or chronic infections [1]. The global rate of HBV infection is high in healthcare workers (HCWs) due to occupational exposure [2]. According to the World Health Organization (WHO), 3 million HCWs experience percutaneous contact with blood-borne pathogens every year, out of which 2 million HCWs being exposed to the

hepatitis B virus [3]. Hepatitis B vaccination is mandatory, and universal vaccination has been recommended in all countries with special recommendations for healthcare workers since 1982 [4]. However, global vaccination coverage is still unsatisfactory [5]. Unvaccinated healthcare workers are the potential sources of not only getting infected with the hepatitis B virus but also in some cases transmitting the infection to

patients. The global ratio of unvaccinated HCWs is high regardless of their knowledge about possible risks of HBV infection. The results of research on HB vaccination status vary in different countries. Studies in South Africa, Pakistan, Sweden, Turkey, and France showed that 19.9%, 37.2%, 39.8%, 55.8%, and 93% of HCWs were vaccinated, respectively [6].

In every country, acquiring the knowledge of people's attitude towards hepatitis B vaccination as well as its coverage and effectiveness in HCWs is a tough challenge, which should be the basis for healthcare policies. Data from Pakistan in this field are not sufficient. There are a small number of studies conducted in Pakistan on the prevalence, status, and awareness of hepatitis B as well as the approach to basic infection control practices. In implementation of effective infection control programs in the healthcare field, basic data will help find the precise direction because the prevalence of this disease and HCWs' attitude vary from place to place.

Faisalabad is the third most populated city of Pakistan, and Allied Hospital is the primary teaching hospital of Punjab Medical College with the capacity of approximately 1300 beds. The current study was conducted to evaluate the prevalence and vaccination status of hepatitis B among healthcare workers in Allied Hospital, Faisalabad, to find the reasons why they were not vaccinated or not given vaccination in the past.

## Materials and Methods

This cross-sectional study was conducted in one year from July 2017 to June 2018. It was conducted at Pakistan Health Research Council (PHRC), Research Centre, Punjab Medical College, Faisalabad. The study sample included 300 healthcare workers divided into two groups. Group 1 consisted of all final year undergraduate and nursing students without any work experience. Group 2 included doctors and nurses from wards of medicine, surgery, gynecology, and emergency, with a minimum of 2 years of experience. Ethical approval was obtained for this study from the

Ethical Review Committee (ERC), Punjab Medical College, Faisalabad, before starting it. In addition, informed consent forms were taken from all participants in this research. A predesigned form was administered to the participants to record information about their demographic characteristics, past history, family history, vaccination status, and HBsAg status before vaccination. In case vaccination was incomplete, they were supposed to state possible reasons for not being vaccinated. Next, about 5ml of their blood was taken to test HBsAg (hepatitis B surface antigen). The serum was tested for HBsAg antibodies with a rapid diagnostic strip by Determine™ HBsAg (Abbott Laboratories) according to the manufacturer's instructions. Data were entered and analyzed in SPSS V16.0 by descriptive statistics and the chi-square test.

## Results

Out of 300 HCWs, 222 (74%) HCWs were female, and 78 (26%) HCWs were male. The majority of the cases aged 20-25. In addition, the majority of the participants were students (130, 43.3%) followed by nurses (93, 31.0%) and doctors (77, 25.6%). 95 (31.7%) individuals were from the department of surgery, 72 (24%) individuals were from the MBBS class, 52 (17.3%) individuals were from the department of medicine, 50 (16.7%) individuals were from the nursing class, followed by 31 (10.3) individuals from the department of gynecology. Out of 300 HCWs, 217 (72.3%) individuals were aware of their HBsAg status at the time of the study. Only 6 (2%) participants had a past history of jaundice. In 36 (12%) participants, some of their family members had experienced jaundice in the past. Out of 300 cases, only 135 (45%) cases were fully vaccinated, i.e. received three doses of the hepatitis B vaccine in the past, 36 (12%) cases were partially vaccinated (one or two doses), and 129 (43%) cases were never vaccinated against hepatitis B. In majority of the cases, vaccination was given within the last 5 years, and only 31 cases were vaccinated more than 15 years ago.

**Table 1.** Mean HCWs' Vaccination Status

		Fully Vaccinated 135 (45.0%)	Partially Vaccinated 36 (12)	Not Vaccinated 129 (43.0)	Total 300
Place of Working/Studying	Nursing School	11(22.0)	4(8.0)	35(70.0)	50
	Medical College	49(68.1)	9(12.5)	14(19.4)	72
	Medicine	18(34.6)	14(26.9)	20(38.5)	52
	Surgery	40(42.1)	6(6.3)	49 (51.6)	95
	Gynecology	17(54.8)	3(9.7%)	11(35.5)	31
Department	Students	64 (49.2)	15 (11.5)	51 (39.2)	130
	Doctors (MOs, HOs, PGs.)	46 (59.7%)	14 (18.2)	17(22.1%)	77
	Nurses	25 (26.9)	7(7.5)	61(65.6)	93

According to the HCWs' vaccination details, the maximum vaccination rate among the fully vaccinated individuals belonged to doctors with 46 (59.7%) out of 77 individuals, who were fully vaccinated, followed by students with 64 (49.2%) students out of 130, and 25 nurses (26.9%) out of 93. 40 (42.1) participants out of 95 from the department of surgery were vaccinated. The related details are given in Table 1.

Reasons for not having been vaccinated included being unaware in 14 (9.6%) cases, regarding it unimportant in 11 (7.5%) cases, being afraid of needles in 28 (19.2%) cases, and lack of time in 93 (63.7%) of cases. Among the fully vaccinated HCWs, only 18 (10.7) participants checked their antibody titer after completing all three doses (Table 2).

**Table 2.** Vaccination Details in the Past

		Frequency	Percentage
<b>Status of vaccination</b>	<b>1 shot</b>	8	5.3
	<b>2 shots</b>	28	16.4
	<b>3 shots</b>	134	78.4
<b>Duration of vaccination</b>	<b>Less than 5 years</b>	95	57.1
	<b>5 to 9 years</b>	24	14.6
	<b>10 to 14 years</b>	14	8.5
	<b>More than 15 years</b>	31	18.9
<b>Did you check antibody status after vaccination?</b>	<b>Yes</b>	18	10.7
	<b>No</b>	150	89.3

### Discussion

Healthcare workers are at a higher risk of getting infected with hepatitis B through professional exposure to blood and infectious body fluids. HCWs, working among infectious people, must be required to have effective sero-protection against hepatitis B through vaccination.

The current study showed that 45% of the HCWs were fully vaccinated against the hepatitis B virus and received three doses of the vaccine; however, 12% of them were partially vaccinated, and 43% of them were never vaccinated. According to the WHO, the rate of HBV vaccination among HCWs in developing countries ranges from 18 to 39%, and it ranges from 67 to 79% in developed countries [7]. The results of this study showed a lower vaccination rate than other studies conducted in Pakistan. A study conducted on HCWs in two university hospitals in Sindh Province revealed that only 64% of HCWs were vaccinated [8]; likewise, a study conducted in Abbottabad City showed 48% of HCWs had a history of vaccination. The variation in vaccination coverage is unsatisfactory because the vaccination rate should have been increased due to the growing knowledge about the problem over time. The vaccination rate in Pakistan is lower than its neighboring country India where the vaccination rate is 78% [9]; in the same vein, it is lower than that of Iran and Saudi Arabia with the vaccination rate of 71.7% [10, 11]. Possible reasons for this difference could be the variation in the study settings where HCWs receive appropriate vaccines and work in a better clinical setting.

The results of the present study showed that only 18 (10.7%) participants checked their antibody titers after completing all three doses. This could be resulted from the fact that in resource-limited countries, the cost of determining anti-HBs titers is higher than that of receiving HBV vaccines [12]. There were 129 (43%) unvaccinated respondents in the current study. The HCWs' approach to their own protection against hepatitis B indicates the carefree attitude among people working in the health sector. The major reason reported for not having been vaccinated was lack of time (63.7%), which could be due to the HCWs' busy schedules. Other reasons included fear of needle (19.2%), unawareness (9.6%), and not attaching importance to vaccination (7.5%).

Among different groups of HCWs, doctors were found to have the highest vaccination percentage of 59.7% followed by students and nurses by 49.2% and 26%, respectively. This result is consistent with the study conducted in Mumbai in which the maximum vaccination rate was found in postgraduate residents followed by medical students [13]. This indicates the education level makes the difference; in other words, the higher the education level is, the more the awareness and the better the vaccination status will be. A relatively higher rate of vaccination was observed in this study among HCWs working in the department of surgery. Direct exposure to patients' blood and body fluids might have led to the greater awareness of the HBV vaccine among HCWs in this field. The relatively low rate of vaccination among HCWs working in the department of

internal medicine stresses the need for raising the awareness of the transmission risk and promoting vaccination in this group. In addition, the results showed that more than 50% of the cases were vaccinated within the past 5 years, which indicates the increasing trend of HB vaccination over time. This could be due to either an increase in awareness through media campaigns or greater acceptance among the HCWs.

The main limitation of this study was its dependence on self-reported HB vaccination status as well as reliance on only HBsAg. However, vaccination was not given to unvaccinated participants due to limited resources. Future studies should be conducted so as to vaccinate unvaccinated HCWs.

### Conclusion

The results of the present study showed that a large number of HCWs in Faisalabad were not vaccinated. Thus, similar studies are required to be done to assess conditions in other tertiary referral hospitals at provincial level. It is recommended that institutions formulate policies of measuring hepatitis B immune status among HCWs upon their entry. They should also provide free HBV vaccines to all HCWs who are partially vaccinated or unvaccinated.

### Acknowledgement

We would like to express our sincere gratitude to Pakistan Health Research Council (PHRC) for providing the grant for carrying out this study. We are also thankful to the staff at the PHRC Research Centre, Faisalabad, for their cooperation, especially to Mr. Shahid Mahmood and Mr. Liaqat Ali, for having collected data and blood samples in this study.

**Conflict of interest:** None declared.

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