

# Vaccination Status Against the Hepatitis B Virus of the Patients Visiting a Tertiary Care Dental Hospital

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## ABSTRACT

**Objective:** To assess the vaccination status for Hepatitis B virus among patients attending a tertiary care dental hospital in Multan, aiming to identify gaps and opportunities for improvement in vaccination coverage.

**Methodology:** This cross-sectional questionnaire study conducted at Multan Dental College from June 2023 to Feb 2023 included patients attending the dental OPD. 181 participants completed the questionnaire regarding vaccination status. Ethical approval and informed consent were obtained from Multan Dental Hospital.

**Results:** Among 181 participants, 98 (54.14%) were males and 83 (45.86%) were females. Regarding age groups, 36 (19.9%) were 16-20 years old, 69 (38.12%) were 21-25 years old, 54 (29.83%) were 26-30 years old, and 22 (12.15%) were 31 years old or above. Out of 181 participants, 51 (28.17%) were non-vaccinated, while 130 (71.83%) were vaccinated. Among the vaccinated, 47 (26%) received the 1st dose, 36 (19.9%) received the 2nd and 3rd doses each, and 11 (6.07%) received the Booster dose. The majority (58.82%) of non-vaccinated individuals cited multiple reasons for not receiving immunization, including vaccine unavailability and busy schedules. Additionally, 9.8% lacked awareness of the vaccination, while others mentioned injection phobia and lack of motivation.

**Conclusion:** The study emphasizes the challenge of incomplete vaccination among patients, which necessitates coordinated efforts by public health officials. Implementing AI-powered reminder systems could effectively address this issue, improving vaccination rates and public health outcomes.

**Key words:** Cross-Sectional Studies, Hepatitis B Vaccines, Patient Acceptance, Vaccination Coverage

### Authors' Contribution:

<sup>1,2</sup>Conception; *Literature research; manuscript design and drafting;* <sup>3,4</sup> Critical analysis and manuscript review; <sup>5,6</sup> Data analysis; Manuscript Editing.

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## Introduction

Hepatitis B is a serious form of inflammatory disease of the liver due to infection caused by Hepatitis B virus (HBV). Approximately 01 million individuals die of Hepatitis (chronic or acute) each year and about 257 million individuals are infected.<sup>1</sup>

The highest endemic levels have been reported in South-East Asia.<sup>2</sup> The prevalence of Hepatitis B in

Pakistan is 4-10% and the amount of infected folks has been rising.<sup>3</sup> The dental workforce including doctors, dental assistants, and dental auxiliaries are at extraordinary risk of attaining infection with a virus of Hep B, HIV, and other blood-borne ailments as they are in direct contact with every (infected or non-infected) patient.<sup>4,5</sup> Hepatitis B is ranked among the most common diseases and it could be fatal too.<sup>6</sup> Many patients reported in the outdoor department

of a dental hospital, may have infectious ailments. These infected persons could be a source of cross-infection<sup>7</sup> and could spread/transfer the infection to healthy persons including dental staff through contaminated instruments, inhalation, oral secretions, and blood.

Stick Injuries with the needles or other sharp-edged instruments used throughout medical and dental procedures have also the threat of transferring the virus of hepatitis B among dental service experts,<sup>8,9</sup> so it is vital to take a proper history of every patient (whether the procedure has to be done or in case of only antibiotics/medicine prescription), and to prepare and adopt the safety measures to evade cross-infection.<sup>10-12</sup> A critical approach to avert HBV transmission is the HBV vaccine, which is a main and cheap method of protection. In un-jabbed individuals, the risk of attaining infection surges from 6%-30%.<sup>13,5</sup>

Dr. Baruch developed a vaccine for hepatitis B in 1981. Nowadays 2<sup>nd</sup> generation of genetically engineered vaccines has been in use.<sup>14</sup> With this vaccine, China decreased the prevalence from 9.75% to 7.18% and prevented sixteen to twenty million of its residents from contracting this disease.<sup>15</sup> Vaccination status in developing nations like Pakistan and India is not that satisfactory and acceptable. Pakistan has been ranked at intermediate risk by WHO.<sup>3</sup> The reasons for the low prevalence of the vaccination include no information on its availability, its high price, the terror of side effects, lack of time, and false belief of invincibility.<sup>16,17</sup>

The objective of the study was to check and find out the vaccination status against the Hepatitis B virus of the patients visiting a tertiary care dental hospital in Multan. Skimpy literature is available on the status of the HBV vaccine among dental patients, as in the past most of the research regarding the status of the HBV vaccine had been carried out on either students or doctors. So, our research focused on dental patients to overcome the knowledge gap.

## Methodology

This cross-sectional study was questionnaire-based and was directed at Multan Dental College from June 2023 to Feb 2023. Patients visiting the dental OPD were included in this study. 181 partakers completed the questionnaire regarding the vaccination status and if they were not inoculated, then, reasons for non-inoculation were noted.

The estimated number of daily patients attending this hospital was approximately 100, so 2600 patients monthly and 7800 patients quarterly. Open-Epi online calculator was used to calculate the sample size at a 5% level of significance and 95% confidence interval, the population of 7800 with 14% diagnosed persons living with HBV in Pakistan<sup>18</sup>, the final sample size came out to be 181. Simple random sampling was used to get the desired sample size. Informed consent of the participants was taken, in addition to the ethical approval from Multan Dental Hospital.

## Results

This Out of 181 participants, 98 (54.14%) were males while 83 (45.86%) were females. When talking about age groups, 36 (19.9%) belonged to the 16-20 years age group, 69 (38.12%) belonged to the 21-25 years of age group, 54 (29.83%) & 22 (12.15%) were in the age bracket of 26-30 and 31 & above respectively. The sociodemographic characteristics of patients are depicted in Table I.

Variable name with category		Frequency (%)
Gender	Males	98 (54.14)
	Females	83 (45.86)
Age in years	16-20	36 (19.9)
	21-25	69 (38.12)
	26-30	54 (29.83)
	31 & above	22 (12.15)

Out of 181 participants, 51 (28.17%) were non-vaccinated while vaccinated were 130 (71.83%). Out of those 130 patients, 47 (26%) received the 1<sup>st</sup> dose,

the 2<sup>nd</sup> and 3<sup>rd</sup> dose was received by 36 (19.9%) participants each, while only 11 (6.07%) got the Booster dose. Several non-vaccinated and vaccinated participants with a dosage of Hepatitis B received are given in Table II.

Dosage	Frequency
1 <sup>st</sup> dose	47 (26%)
2 <sup>nd</sup> dose	36 (19.9%)
3 <sup>rd</sup> dose	36(19.9%)
Booster dose	11 (6.07%)
Total Vaccinated	130(28.17%)
Non-Vaccinated	51(71.83%)

Reasons	Frequency (Percentage)
Did not know about the vaccination	5 (9.8)
Vaccine unavailable	4 (7.84)
Busy Schedule	3 (5.8)
Distant vaccination center	0 (0)
Costly vaccine	0 (0)
Lack of motivation	4 (7.84)
Fear of needle	5 (9.8)
More than one reason	30 (58.82)

Among non-vaccinated, the majority (58.82%) reported more than one reason for not receiving an immunization, saying that this vaccine was unavailable in their area, patients who were non-vaccinated because of a busy schedule, 9.8% didn't have awareness regarding this vaccination, phobia to injection was among subjects and non-motivation were the reason for subjects Table III. Participants who received 1<sup>st</sup> or 2<sup>nd</sup> dose and are yet to get the 3<sup>rd</sup> dose also reported several reasons for this.

## Discussion

Dental assistants and dental surgeons are at extreme risk not only while dealing with the patient but also during the handling of instruments specifically sharp instruments.<sup>19</sup>

In the modern era, the number of patients in dental OPD is on the rising side as the populace is more aware and realized that teeth and lips have a great influence/impact on one's personality and are also imperative for emotional, psychological wellness of persons other than chewing, speaking.<sup>20-22</sup> The best way to deal with dangerous infectious ailments is to get inoculated.<sup>23</sup> Jab against Hepatitis B ought to be compulsory for everyone.<sup>24</sup> The approach & policy of receiving inoculation at the governmental level should be an effective strategy.<sup>25</sup> It is the moral and obligatory duty of the doctor to protect dental care providers and patients from cross-contamination.<sup>26,27</sup> In this study, 45.86% of participants were females, which is comparable to several other studies where female patients were 38%, 71.4% & 64.3% respectively.<sup>7, 28-29</sup> In this study, vaccinated subjects were 71.83% while non-vaccinated were 28.17%. This is better than the findings of other studies where 44.2% and 63.5% of participants were jabbed.<sup>4,5</sup> Only 24% of subjects in another survey were vaccinated.<sup>30</sup> In this study, 26% of subjects received the 1<sup>st</sup> dose against HBV, which is far better than that of another research where 11.1% got the 1<sup>st</sup> dose.<sup>5</sup> In this study, 19.9% & 19.9% of subjects received the 2<sup>nd</sup> & 3<sup>rd</sup> dose against HBV respectively, which is comparable with other research where 16.9% & 32% of subjects got the 2<sup>nd</sup> & 3<sup>rd</sup> dose respectively.<sup>5</sup> Only 11 (6.07%) participants in this study got the Booster dose, which is identical to that of another research where 5.8% of subjects received a full dose of the HBV vaccine.<sup>31</sup> 20.4% of subjects of another survey got a booster dose.<sup>24</sup> Infection and cross-contamination in dental clinics/hospitals have become major concerns for the public and patients are afraid too and conscious because there is always a danger of cross-infection in a dental setting.<sup>32,33</sup> More than 50% of patients in a study of Sofola felt that they may contract/catch an infection in dental settings.<sup>34</sup> So, healthcare consultant needs to comprehend how are various infectious ailments transmitted and take proper histories of the patients including inoculation.<sup>35,36</sup>

Dental patients may present with swelling & severe pain.<sup>37,38</sup> 72.6% and 63.2% of subjects of the past study, agreed they can catch/contract & HBV respectively during dental treatment. More than sixty per cent of patients reported that they wouldn't receive dental treatments where HBV/HCV & HIV patients are being treated, so vaccination of patients is equally important. The greatest risk factors for the transmission of HCV include blood transfusions (fifteen per cent), history of hospitalization (fourteen per cent), followed by dental treatment (thirteen per cent), use of injections (twelve per cent), and history of surgery (nine per cent).<sup>39-41</sup> The public should get themselves fully vaccinated against lethal ailments as soon as possible.<sup>42</sup> Unavailability and high cost of the vaccine were frequently mentioned reasons for not being vaccinated against HBV.<sup>29</sup> Among 807 women, 80.8% were willing to have the vaccine injected which had the average price of 108,600 VND.<sup>43</sup> In this survey, 58.82% of patients reported more than one reason for non-vaccination which is identical to another research.<sup>44</sup> In addition to fear, a person's socioeconomic level can also predict a variety of life outcomes such as their physical and mental well-being, The Low percentage of vaccinated folks may be due to low socioeconomic status.<sup>44, 45,46</sup> We accentuate the significance of the public health initiatives.<sup>47</sup>

## Conclusion

This study indicated that many of the patients could not complete the entire vaccination procedure due to many reasons. So, the Public Health authorities must work on these reasons for incomplete vaccination and build software to give reminders to the patient for subsequent doses of vaccination. Health authorities should take help from Artificial Intelligence to aware the patient regarding vaccination.

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