

# Does Unrealistic Optimism Contribute to Low Hepatitis B Vaccination Rates among Healthcare Workers and Medical Students?

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## ABSTRACT

**Objective:** This study aims to determine the role of unrealistic optimism in the development of attitudes towards hepatitis B vaccination among healthcare workers (HCWs) and medical students.

**Methodology:** This was a cross-sectional, survey-based descriptive study conducted at the Medicine Department of Azra Naheed Medical College, Lahore. An anonymous self-administered questionnaire was developed that enquired from the participants their vaccination status and the main reason(s) for not getting vaccinated. Informed consent was received from all the study participants and the confidentiality of the data was ensured. Formal approval for the study was granted by the Ethical Review Board of Azra Naheed Medical College, Lahore. The questionnaire was completed by 325 HCWs and medical students working and studying at Azra Naheed Medical College and its affiliated hospital, Chaudhry M. Akram Teaching & Research Hospital. Five options that signaled an attitude of unrealistic optimism were included in the questionnaire and a participant was considered to exhibit unrealistic optimism if they chose one of these five reasons for not getting vaccinated. The data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 23.

**Results:** Out of 325 respondents, 143(44%) had received hepatitis B vaccination, 155(46.7%) were not vaccinated for hepatitis B while 27(8.3%) individuals were not sure whether they were vaccinated or not. The three most common reasons for not getting vaccinated were never felt the need to be vaccinated (44.9%), never thought about getting vaccinated (44%) and lack of motivation (40.5%). Nearly three fourth of the respondents, 115(74.2%) out of 155 exhibited unrealistic optimism for non-vaccination whereas the number of respondents who did not show an unrealistic optimism attitude was 40/155 (25.8%).

**Conclusion:** Unrealistic optimism among healthcare workers and medical students appears to be one of the main psychological factors responsible for low rates of vaccination against hepatitis B. Medical students and HCWs should be made aware of the high risk and prevalence of needlestick injuries and the urgent need for vaccination against hepatitis B. They should be educated about the various self-serving biases, including unrealistic optimism in the curriculum.

**Keywords:** *Unrealistic optimism. Hepatitis B vaccination. Healthcare workers. Medical students.*

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## INTRODUCTION

Hepatitis B virus (HBV) infection is one of the major causes of morbidity and mortality in the world, particularly in developing countries. Hepatitis B virus infection and its related complications are among the top ten leading causes of death worldwide.<sup>1</sup> In 2015, nearly 257 million people globally were suffering from hepatitis B virus infection according to the World Health Organization (WHO). A majority of these infected individuals were not receiving treatment and hence were prone to the complications associated with HBV infection. Viral hepatitis was responsible for 1.34 million deaths in 2015 and the mortality is worryingly on the rise. Hepatitis B and C virus infections account for 96% of these deaths.<sup>2</sup> Up to 40% of the patients having chronic HBV infection will develop complications like

cirrhosis, liver failure or hepatocellular carcinoma.<sup>3,4</sup>

Longitudinal studies have reported that 20-40% of males and 15% of females who are infected with HBV develop hepatocellular carcinoma later on in their life. In individuals who remain hepatitis B surface antigen (HBsAg) carriers, the risk of development of hepatocellular carcinoma is extremely high.<sup>5</sup>

The WHO first recommended universal immunization against HBV in 1991. By May 2002, 154 countries in the world included hepatitis B vaccination as a part of their infant immunization programs.<sup>1</sup> The protection from HBV vaccination lasts for at least 20 years. The WHO thus currently does not recommend booster vaccinations for individuals who have completed three mandatory doses of hepatitis B. If not vaccinated as children, the WHO recommends HBV vaccination for healthcare workers and all others who are exposed to blood or its products through their work.<sup>6</sup>

The Centers for Disease Control & Prevention (CDC) and the Advisory Committee on Immunization Practices (ACIP) also strongly recommend healthcare workers (HCWs) to be vaccinated against HBV infection.<sup>7</sup> There has been a significant reduction in the prevalence of chronic HBV infection in the most developed and developing countries of the world from 1990 to 2005. This is thought to be mainly related to

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expanded immunization. Despite this reduction, the total number of persons infected with HBV increased from 223 million in 1990 to 240 million in 2005.<sup>8</sup> The World Health Assembly, in May 2016, adopted and announced its first strategy to combat viral hepatitis. It aims an ambitious reduction in the number of new viral hepatitis cases by 90% and the overall mortality by 65% by the year 2030.<sup>6</sup>

Unrealistic optimism is the tendency of people to wrongly predict that their own personal outcomes would be more favorable than the outcome of their peers. Unrealistic optimism has been documented in over a thousand studies to affect people's judgment related to disease, unwanted pregnancies, chances of getting a divorce or having sexually transmitted diseases.<sup>9</sup> A qualitative study from Australia looking at parents' attitudes towards vaccinating their children found unrealistic optimism as one of the factors affecting their decision to vaccinate their children.<sup>8</sup> Relatively fewer studies, however, have previously reported the actual negative consequences of unrealistic optimism.<sup>10</sup>

Brewer and colleagues reported that individuals who considered themselves at high risk of getting influenza were 24 times more likely to get vaccinated for influenza as compared to individuals who did not consider themselves at risk.<sup>11</sup> A study conducted on male homosexuals found that 24.8% of the study participants cited not being in the at-risk group as the main reason for not getting vaccinated for HBV.<sup>12</sup> A meta-analysis suggested that risk perception was significantly associated with vaccination behavior. The authors concluded that raising the risk perception from low to high would have a major effect on vaccination behavior.<sup>13</sup> A large scale study of parents (n=1763) found that a high perceived vulnerability for contracting meningococcal infection resulted in a more positive evaluation of the vaccination campaign.<sup>14</sup> A systemic review of studies that explored the factors associated with hepatitis B vaccination in gay men found a positive association between increased perceived vulnerability and increased uptake of hepatitis B vaccination.<sup>15</sup>

The prevalence of HBV infection in the Pakistani general population is thought to be between 2-3% nationally.<sup>16</sup> The low rates of hepatitis B vaccination among HCWs and medical students is a major concern as the prevalence of needlestick injuries among HCWs is quite high. Previous studies have reported needlestick injury rates of 41% in Nigeria, 68.2% in India, 71.9% in Pakistan and 58% in Ireland.<sup>17-20</sup> Other studies have reported that less than a third of HCWs know reasonably well what steps they need to take immediately after receiving a needlestick injury.<sup>21</sup> The main purpose of the current study was to investigate the role of unrealistic optimism in hepatitis B non-

vaccination among medical students and HCWs in Pakistan. Only a few studies in the past have tried to address this issue.

## METHODOLOGY

This was a cross-sectional, survey-based descriptive study conducted at the Medicine Department of Azra Naheed Medical College, Lahore. An anonymous self-administered questionnaire was developed that enquired from the participants their vaccination status and the main reason(s) for not getting vaccinated. This list was based on an extensive review of the literature available in the field. Participants were able to choose one or more of the reasons for non-vaccination. The participants were asked to answer either yes or no to the following reasons for not receiving the hepatitis B vaccination. Out of all the options, a participant was deemed to exhibit an attitude of unrealistic optimism if he/she chose one of the following five options for not getting vaccinated:

- Never felt the need to be vaccinated
- Never thought about getting vaccinated
- Lack of motivation
- Not in the risk group
- Lack of awareness

The questionnaire was validated on 20 medical students and the results were found satisfactory. Participation was on a voluntary basis. Informed consent was received from all the study participants and the confidentiality of the data was ensured. Formal approval for the study was granted by the Ethical Review Board of Azra Naheed Medical College, Lahore. Data collection commenced from March to August 2018 with sampling through nonprobability convenient technique. The questionnaire was completed by 325 HCWs and medical students working and studying at and Azra Naheed Medical College and its affiliated hospital, Chaudhry M. Akram Teaching & Research Hospital.

## STATISTICAL ANALYSIS

The data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 23 and expressed in frequency and percentage.

## RESULTS

Most of the study participants (86.8%) were in their 20's. The majority of the participants were single (84.6%). There were 187(57.5%) females and 138(42.5%) males. The study sample consisted of 222(68.3%) medical students, 74(22.8%) medical doctors and 29(8.9%) allied health professionals.

Out of the 325 respondents, 143(44%) had received hepatitis B vaccination in the past. Nearly half of the respondents, 155(47.7%) out of 325 were not

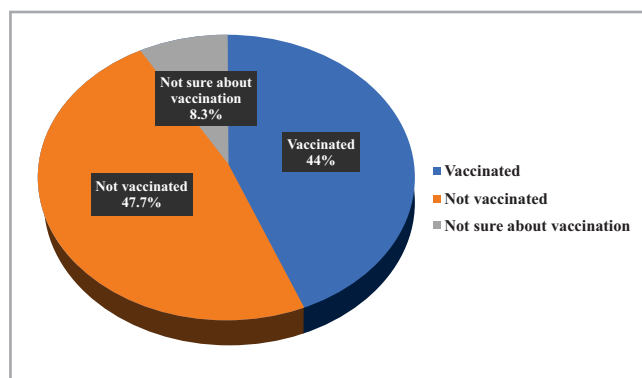


Figure 1: Vaccination Status of the Study Participants

vaccinated for hepatitis B while 27(8.3%) individuals were not sure whether they were vaccinated or not (Figure 1). Almost half of them (47.6%) received the vaccination in the preceding one year, 15.1% were vaccinated 2-5 years back, 18.9% 5-10 years back and 18.4% were vaccinated more than 10 years ago. Out of 143 individuals who were vaccinated, 92(64.3%) of the total participants received all the three doses of hepatitis B vaccination. Twenty five individuals (17.5%) received at least one dose while 26(18.2%) were not sure about the number of doses administered as shown in figure 2.

The majority of the individuals (61.6%) not previously vaccinated for HBV were willing to be vaccinated if provided with the vaccine and 57.8% were willing to be screened for the presence of the viral infection. The previous history of HBV infection was positive in 11.1% of the respondents and hepatitis C virus (HCV) infection in 9.2% of the respondents. More than a quarter of the respondents (28.9%) had a family member suffering from HBV infection.

Most of the participants, 118(76.1%) out of 155 chose more than one option for not getting vaccinated. The three most common reasons for non-vaccination were

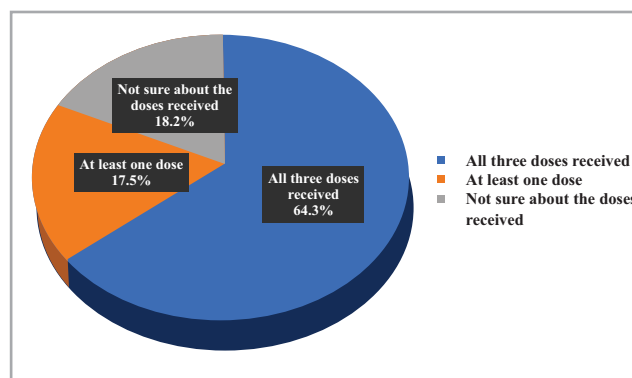


Figure 2: Number of Doses Received in Study Participants who were Vaccinated for HBV

never felt the need to be vaccinated (44.9%), never thought about getting vaccinated (44%) and lack of motivation (40.5%). Other reasons for not getting vaccinated were as follows: fears about the quality of the vaccine (38.6%), fear of having an infection (38.4%), lack of awareness (35.3%), not being in the risk group (31.4%), non-availability of the vaccine (29.4%), fear of needles (28.6%), not being able to afford the vaccine (18.4%), having an allergy to the vaccine (14.1%), having a chronic illness (13.1%) and having a religious reason for not getting vaccinated (11.4%).

Nearly three fourth of the respondents, 115(74.2%) out of 155 exhibited unrealistic optimism for non-vaccination whereas the number of respondents who did not show an unrealistic optimism attitude was 40/155 (25.8%). These results are shown in table 1.

## DISCUSSION

Despite the easy availability, safety and effectiveness of the hepatitis B vaccine, the number of HCWs who receive the vaccination especially in the developing countries is not satisfactory.<sup>16</sup> In our study, only 44% of the participants were vaccinated against HBV

Table 1: Reasons for Not Getting Vaccinated among Healthcare Workers and Medical Students

| Reason for Not Getting Vaccinated            | Percentage of Study Participants Choosing the Option |
|----------------------------------------------|------------------------------------------------------|
| Never felt the need to be vaccinated         | 44.9%                                                |
| Never thought about getting vaccinated       | 44%                                                  |
| Lack of motivation                           | 40.5%                                                |
| Quality of the product                       | 38.6%                                                |
| Fear of infection                            | 38.4%                                                |
| Lack of awareness                            | 35.3%                                                |
| Not in the risk group                        | 31.4%                                                |
| Non-availability of the vaccine              | 29.2%                                                |
| Fear of needle                               | 28.6%                                                |
| Not being able to afford the vaccine         | 18.4%                                                |
| Allergy with the vaccine                     | 14.1%                                                |
| Any chronic illness                          | 13.1%                                                |
| Not getting vaccinated for religious reasons | 11.4%                                                |

infection. A cross-sectional study done in Karachi, Pakistan among the adults visiting family medicine clinic at a tertiary care hospital reported that only 36.4% of the respondents were vaccinated for hepatitis B.<sup>22</sup> In a study conducted at Allama Iqbal Medical College Lahore, 49% of HCWs and 42.2% of medical students were vaccinated against hepatitis B virus.<sup>23</sup> Another study from the Pakistan Institute of Medical Sciences (PIMS), Islamabad reported that 57.6% of the HCWs were fully vaccinated while 18.3% were partially vaccinated against hepatitis B virus infection.<sup>24</sup> One study done at 7 medical colleges/universities in Karachi reported a higher rate of vaccination (79%) among medical students as compared to our study.<sup>25</sup> A study from North India reported hepatitis B vaccination rates of 59.5% among HCWs.<sup>26</sup>

Our results showed that unrealistic optimism was one of the major factors responsible for low vaccination rates among HCWs and medical students. Nearly three-fourths of the study participants (74.1%) did not get vaccinated against hepatitis B due to unrealistic optimism. Many studies conducted in Pakistan determined the factors associated with hepatitis B non-vaccination. Their results showed unrealistic optimism as the major cause of non-vaccination but have not used this term when reporting their findings.<sup>23,24,27</sup> Nasir et al. conducted a study on 205 HCWs and 327 medical students at Allama Iqbal Medical College, Lahore. The main reason for non-vaccination was the high cost of vaccination (47.7%) among HCWs and the belief that they were not at risk of getting infected.<sup>23</sup> A study done at the Pakistan Institute of Medical Sciences, Islamabad concluded that awareness and attitude problems were the major cause of participants not getting vaccinated against hepatitis B.<sup>24</sup> A study from Mohammad Medical College, Mirpurkhas enrolled 375 medical students. According to this study, lack of motivation was the most common cause (29.2%) of hepatitis B non-vaccination followed by not feeling the need to get vaccinated (24.8%), never thought of getting vaccinated (21.7%), injection fear (10.5%) and lacking belief in vaccination (8.07%).<sup>27</sup>

The finding that unrealistic optimism is one of the major factors that affect the decision to get vaccinated is significant for many reasons. If replicated in the future, preferably from longitudinal prospective studies, this would mean that a change of strategy is needed to achieve the goal of universal immunization of HCWs and medical students. Newer strategies that focus on the clear communication of the risks associated with non-vaccination and the actual likelihood of getting infected in case of non-vaccination would need to be developed. Medical students should be informed about these risks in their curriculum. Also, Behavioral Sciences curriculum

needs to be updated to include education about various self-serving biases, in particular, unrealistic optimism. For HCWs, the hospitals should provide the information about risks of not getting vaccinated in a clear and concise manner in their initial orientation at induction. Also, awareness campaigns that target the general population should focus on communicating the risk of non-vaccination and the actual vulnerability of being infected. This is true not only for hepatitis B vaccination but also applies to other vaccination programs such as poliomyelitis and influenza vaccination campaigns.

## CONCLUSION

Unrealistic optimism among healthcare workers and medical students appears to be one of the main psychological factors responsible for low rates of vaccination against hepatitis B. Medical students and healthcare workers should be made aware of the high risk and prevalence of needlestick injuries and the urgent need for vaccination against HBV infection. They should be educated about the various self-serving biases, including unrealistic optimism in the curriculum.

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