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ASSESSMENT OF THE VACCINATION STATUS, KNOWLEDGE, AND AWARENESS OF HEPATITIS B AMONG ALLIED HEALTH SCIENCES STUDENTS AT KHYBER MEDICAL UNIVERSITY, PESHAWAR

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Abstract

Background:
Hepatitis B is a major worldwide health issue that impacts the liver and can cause cirrhosis, liver cancer, and chronic illness. Because work exposure puts healthcare students at higher risk, vaccination and awareness are crucial.

Objectives:
To evaluate knowledge, awareness, and vaccination status of Allied Health Science students of KMU Peshawar about Hepatitis B.

Methodology:
A structured questionnaire was used to perform a cross-sectional study with 258 undergraduate students. IBM SPSS 27 version Statistics was used to examine the data, which were gathered via stratified random sampling. The data was summarized using descriptive statistics like frequency and percentage and inferential statistics for association.

Results:
Most students (97.3%) were aware of Hepatitis B and correctly classified it as a viral condition that affects the liver. However, only 21.7% of students received vaccinations, compared to 71.3% who did not. A small portion had misconceptions or insufficient information about the illness.

Conclusion:
Students' basic knowledge and awareness of Hepatitis B were adequate, but their vaccination status was insufficient. To safeguard future medical professionals, vaccination uptake must be increased by institutional support, awareness campaigns, and simple access to vaccines.

INTRODUCTION

Hepatitis B virus (HBV) infection has been identified as the most common viral infection worldwide. Nearly two billion people have been infected with it, and nearly half a billion people are chronic virus carriers [1].

According to World Health Organization, in 2015, 3.5% of the population, were living with chronic HBV infection and it is responsible for 1.34 million deaths worldwide. Most affected

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regions were the African and Western Pacific regions, accounted for 68% of those infected [2]. HBV is 100 times more infectious than HIV [3].

Common modes of transmission are, from an infected mother to a child at birth, accidental exposure to blood and body fluids through percutaneous and mucosal routes in hospital settings, sexual intercourse, and through shared needles by intravenous drug users [4]. As per the Global Hepatitis Report 2024, there was an incidence of 1.2 million cases added to the 254 million cases already living with Hepatitis B in 2022 [5]. Hepatitis B is a vaccine preventable disease**.** The hepatitis B vaccine is safe, highly effective, and provides long-lasting protection against HBV infection[6]. Vaccination, along with standard infection prevention and control practices, plays a crucial role in reducing the transmission of the virus[7].

The risk of acquiring Hepatitis B infection is found to be higher among health care personals during their professional health trainings. The incidence of such infection is found to be 2-4 times higher compared to the general population [8]. The primary method of preventing Hepatitis B infection is vaccination, which provides 90 to 100 percent protection after a full course of immunization [9]. Several epidemiological studies have been conducted to assess the prevalence of good practices for preventing HBV among medical and health science students. These studies have revealed a wide range of magnitude rates. For instance, in Nepal, the magnitude stands at 14.2% while in India, it is significantly higher at 76.59%. Similarly, in Ethiopia, the magnitude varies from 30.2% [10].

The Advisory Committee on Immunization Practices (ACIP) recommends hepatitis B vaccine for everyone above 18 years of age and below, as well as adults above 18

years of age who are at risk of HBV infection [11]. Hepatitis B vaccine is the first anticancer vaccine which has outstanding record of safety and effectiveness. It is 95% effective in preventing children and adults from developing chronic infection [12]. As Undergraduate Allied Health Science students of KMU Peshawar are constantly in contact with patients of different tertiary care hospitals i.e. KTH, LRH and HMC during their clinical rotations so they are at high risk of getting the disease.

Hepatitis B Vaccination status in Pakistan

In Pakistan, Infants have a comparatively high vaccination rate. 87% of one-year-olds had received Hepatitis B vaccine as of 2024 [13-16]. While In adults, vaccination coverage rates are low, at about 30% [17, 18]. High risk group (Healthcare professional) have Complete vaccination coverage (three doses) among healthcare workers (HCWs) varies some studies show 40% to 69.4% coverage, which is frequently related to requirements for job admission [16, 19, 20]. Self-reported prevalence**,** According to a 2025 poll, there are roughly 7-9 million carriers of HBV/HCV in the nation, and inadequate vaccination coverage (26.4% in one study) is a major risk factor [21].

Worldwide vaccination data

Global child reported**:** An estimated 84% of people worldwide have received three doses of the hepatitis B vaccine [22, 23]. New-born baby dosage**:** 45% of births are covered globally (within 24 hours of birth) [22, 24]. Healthcare professional: Approximately 44.8% of nurses worldwide have had the full HBV vaccination [25, 26]. Globally, an estimated 257 million individuals have chronic hepatitis B, and many of them, especially in Africa, have limited access to the vaccine [27, 28].

Hepatitis B is a viral infection caused by the Hepatitis B virus that significantly effect and damage liver and can result in both acute and long-term illness [29].

Hepatocellular carcinoma, liver cirrhosis, and even mortality can result from a persistent infection [30]. It is transmitted from person to person by contact with percutaneous injury unsafe medical practice, used syringe and razers infected blood, body fluids, unsafe hygienic injections, and nonprotected sexual activity, and also the increased risk of exposure in healthcare settings is one of the main reasons Pakistan needs

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this investigation. There are still reports of unsafe medical practices
in a number of healthcare facilities, including the reuse of syringes, incorrect equipment sterilization, and insufficient infection control measures. Because they often come into touch with blood, bodily fluids, and contaminated equipment during their clinical rotations, undergraduate Allied Health Sciences students are at a markedly increased risk of developing HBV. [31].
According to the Global health and World Health organizations that hepatitis B is still a serious global public health issue, a leading cause of illness and death globally, especially in developing nations where vaccination rates and knowledge may be low [32, 33]. Due to their frequent exposure to patients and clinical processes, healthcare professionals and students in medical and allied health disciplines are especially vulnerable, Therefore lowering the risk of infection in these populations requires appropriate information, awareness, and preventive measures [34]. Thus, before beginning clinical practice, it is highly advised that all healthcare professionals and students have a hepatitis B immunization [35].

Study justification

Awareness of Vaccine

The Future Allied Health Sciences undergraduate students of KMU who will be directly involved in the treatment of patients, their degree of knowledge, awareness, and immunization status is vital for both self-defence and stopping the spread of HBV in medical environments**.**

Evaluation of Allied Health Science students

Evaluating healthcare students' readiness becomes crucial in areas like Peshawar, Pakistan, where the burden of infectious diseases is very high and healthcare resources may be few. There is little information on the level of understanding and vaccination compliance among Khyber Medical University (KMU) Allied Health Sciences students, despite the known concerns.

Vaccination status

The purpose of this study is to assess awareness levels, identify current knowledge gaps, and find out Undergraduate Allied Health Science students of KMU's vaccination status. The results will aid in the development of focused
educational initiatives, the enhancement of vaccination regulations, and the improvement of general infection control procedures in educational and medical settings.

MATERIAL AND METHODS

Study Design

A descriptive cross-sectional study was used to carry out data collection.

Study Setting

The study was conducted at the Institute of Allied Health Sciences, Khyber Medical University (KMU) Peshawar, Khyber Pakhtunkhwa, Pakistan.

Study Population

The target population of the study was undergraduate Allied Health Science students of KMU Peshawar.

Inclusion Criteria

Undergraduate Allied Health Science students of KMU Peshawar. Students enrolled in 5th, 6th, 7th, and 8th semesters.
Students willing to participate in the study.

Exclusion Criteria

Students from 1st and 2nd year with no clinical exposure. Students who were absent during data collection.
Students who did not willing to participate in the study.

Sample Size and Sampling Technique

A total sample size of 284 students was selected using stratified random sampling technique. The participants were selected from different Allied Health Science departments to ensure equal representation.

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Data Collection Tool

Data were collected through a structured questionnaire developed after reviewing previous related studies and literature. The questionnaire consisted of different sections including:

Demographic information

Knowledge about Hepatitis B Awareness regarding Hepatitis B Vaccination status of participants

Data Collection Procedure

After obtaining permission from the IRB, the questionnaires were distributed among the students during academic hours. The purpose of the study was explained to all participants before data collection. Participation was voluntary. Confidentiality of the participants were strictly maintained throughout the study.

Data Analysis

The collected data were entered and analyzed using IBM SPSS Statistics version 27. Descriptive statistics such as frequencies, percentages, mean, and standard deviation were used to summarize the data. Inferential statistics, including chi-square test, were applied to determine the association between awareness and vaccination status. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations

Ethical principles were followed throughout the research process. Permission was obtained from the concerned authorities of KMU before conducting the study. Participants were informed about the purpose of the study, and their participation was completely voluntary. Confidentiality of the collected information was ensured, and the data were used only for research purposes.

Limitations of the Study

The study had some limitations. Due to limited time and low response rate from some students, only 258 responses were collected out of the total sample size of

284. In addition, the study was conducted in a single institution, which may limit the generalizability of the findings to other healthcare institution.

RESULTS AND DISCUSSION

A total of 258 responses were collected with response rate of 90.8% from Allied Health Science students of KMU. Both male and female students from different disciplines of AHS participate in this study. Male ratio is higher (199 or 77.1%) than

female (59 or 22.9%). Most of the students are in the age group of 22-26 (178 or 69%) year old. Regarding student status, the majority of students were fresh (231 or 90.2%), whereas a smaller proportion were in-service students (25 or 9.8%). Regarding study program most of the students are from Health Technology (37 or 14.3%) while Cardiology are the least (17 or 6.6%). Most of the students were from 6^{th} (121 or 46.9%) and 8^{th} (119 or 46.1%) semester respectively. (Table 1)

Table 1. Demographic characteristics of respondents (n= 258)

Variables	Category	Frequencies	Percentages
Gender	Male	199	77.1%
	Female	59	22.9%
Age Group	18-22	59	22.9%
	22-26	178	69%
	26-30	13	5%

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	>30	8	3.1%
Students Status	Fresh	231	90.2%
	In service	25	9.8%
Program of study	Anaesthesia	19	7.7%
	Cardiology	17	6.6%
	Dental	18	7%
	Dialysis	23	8.9%
	EMR	28	10.9%
	Health	37	14.3%
	MLT	30	11.6%
	Radiology	25	9.7%
	RT-ICU	34	13.2%
	Surgical	27	10.5%
Current semester	5^{th}	18	7%
	6^{th}	121	46.9%
	7^{th}	0	0%
	8^{th}	119	46.1%

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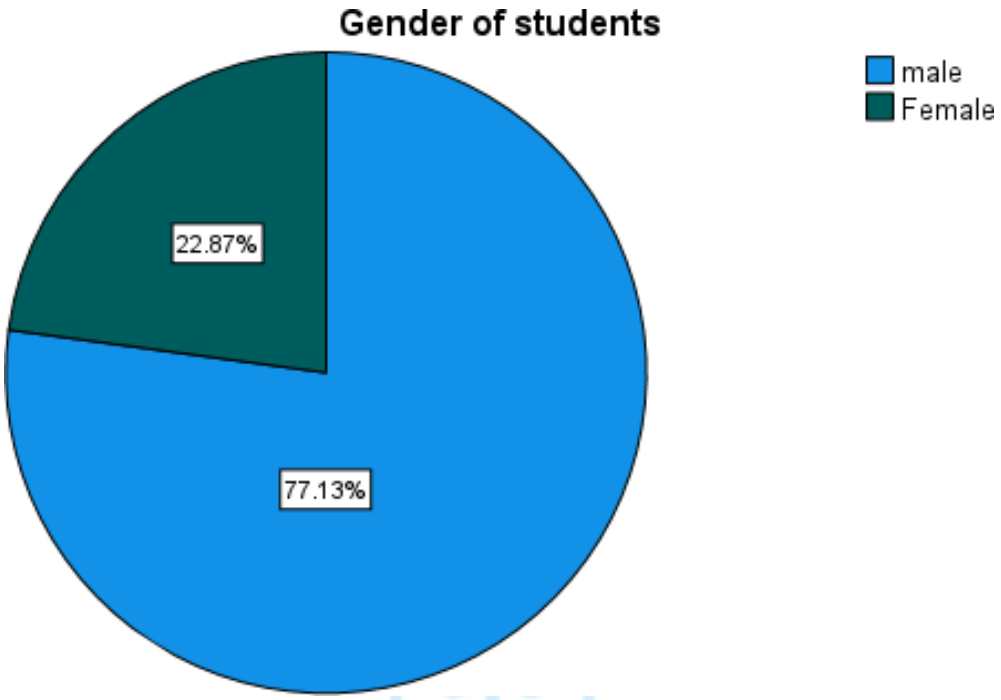


Figure.1 Percentage of Gender of students.

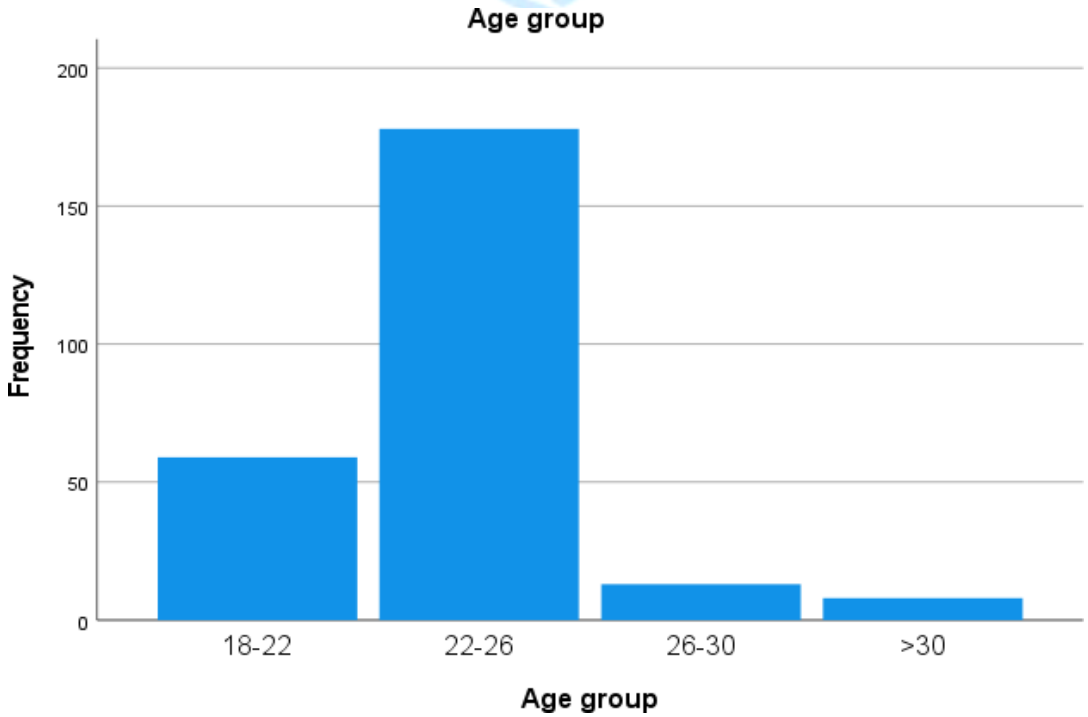


Figure.2 Age groups of the students.

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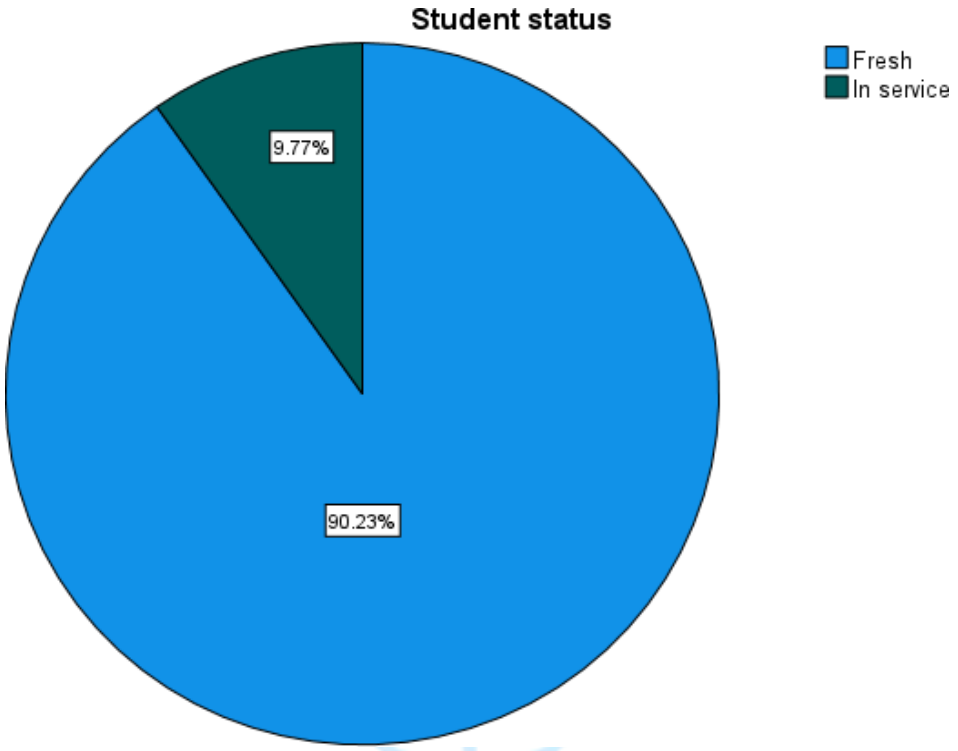


Figure.3 Percentages of Students status

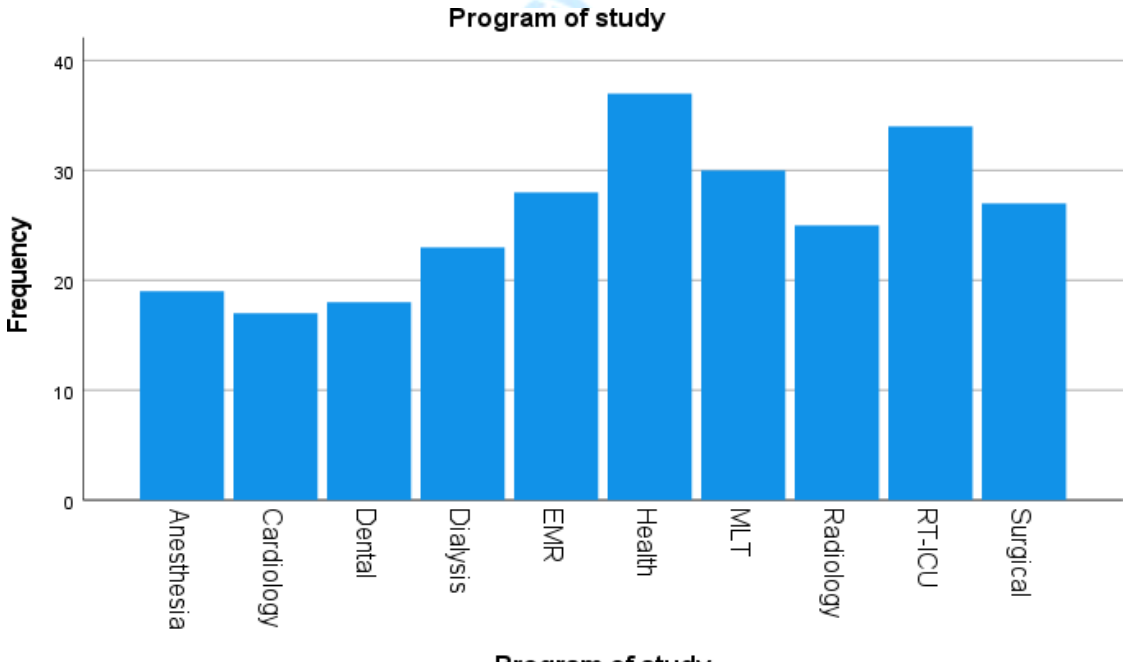


Figure.4 Frequencies of program of study.

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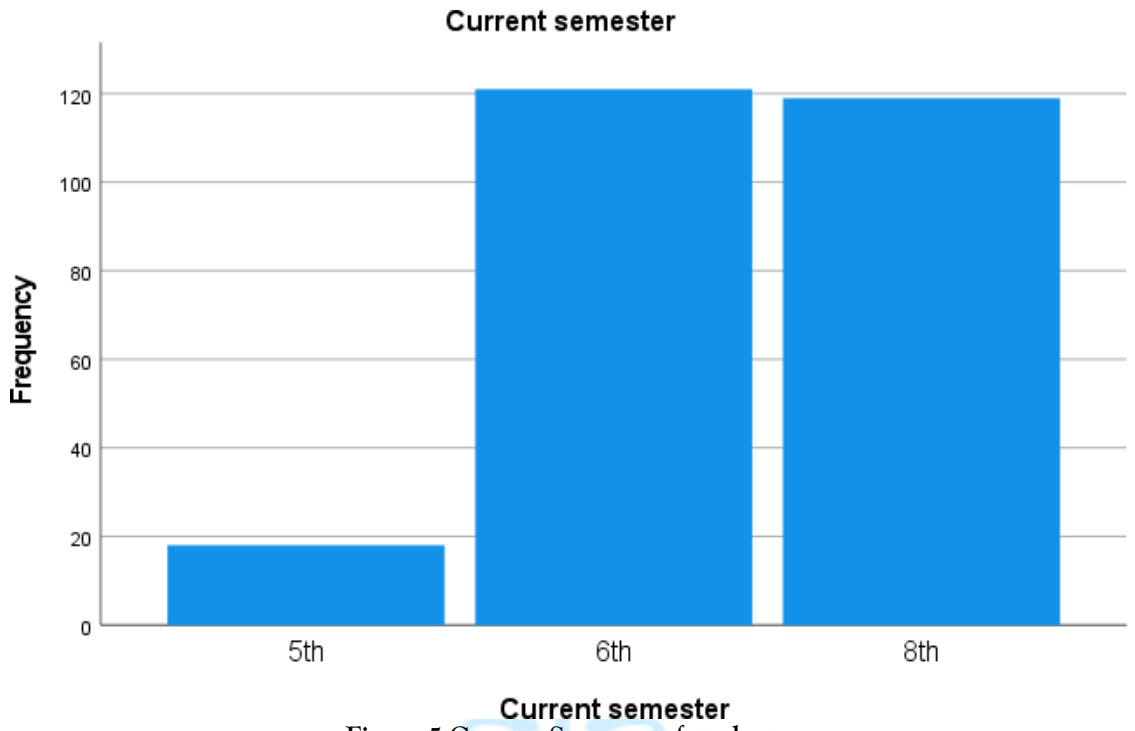


Figure.5 Current Semester of students.

Our main focus in this study was to evaluate the vaccination status, knowledge and awareness of hepatitis B among the students. Among the respondents 56 (21.8%) were vaccinated against Hepatitis B virus and majority, 184 (71.6%) were not been vaccinated against HBV. The main reason for being not vaccinated is the lack of awareness of vaccination programs (especially Hep B) and no interest in the vaccination programs while some students reports fear of side effect. Only 17 (6.6%) students don't know their vaccination status. (Table 2)

Table 2. Vaccination status of the respondents (n= 258)

Vaccination Status	Frequency (n)	Percentage (%)
Vaccinated	56	21.7%
Not vaccinated	184	71.3%
Unknown Status	17	6.6%
Total	258	100.0%

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Regarding awareness, 250 (96.9%) of the students are aware about Hepatitis B from different sources and the main source of information about Hepatitis B was Academic curriculum and Healthcare professionals. (Table 3)

Table 3. Awareness about Hepatitis B among students (n = 258)

Awareness Responses	Frequency (n)	Percentage (%)
Yes	250	96.9%
No	2	0.8%
Maybe	5	1.9%
Missing	1	0.4%
Total	258	100.0%
Source of Information	Frequency (n)	Percentage (%)
Academic curriculum	154	59.7%
Healthcare professionals	79	30.6%
Social media	9	3.5%
Friends and family	9	3.5%
Others	6	2.3%
Missing	1	0.4%
Total	258	100.0%

Knowledge assessment has been done by knowledge score. The overall knowledge score of participants regarding Hepatitis B ranged from 0 to 5, with a mean score of **3.84** . Nearly **38.0**% of participants, demonstrated good knowledge, while **46.5**% had moderate knowledge and **15.5**% showed poor knowledge. (Table 4)

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Table 4. Overall Knowledge Score Distribution about Hepatitis B among Participants (n = 258) OR

Knowledge category	Score range	Frequency (n)	Percentage (%)
Poor knowledge	0-2	40	15.5%
Moderate knowledge	3	120	46.5%
Good knowledge	4-5	98	38%

Table 4. Mean Knowledge Score of Participants

Variable	Mean score	Maximum score	Minimum score
Knowledge score	3.84	5	0

A chi square test was applied to determine the association between awareness of hepatitis B and vaccination status among students. The results show that there is no statistically significant association b/w the two variables ($\chi 2$= 8.747, df= 4, p= 0.068).

DISCUSSION

Hepatitis B virus infection is a major public health problem worldwide; roughly 30% of the world's population show serological evidence of current or past infection [36]. [37] This study aims to assess status, knowledge and awareness of hepatitis B among Allied Health Science students of KMU Peshawar. The finding shows that, although most of the students are aware of hepatitis B but having low vaccination coverage. Similar study was also conducted y various researchers and the results was similar to present study[38].

In our study almost, all participants (97.3%) have heard about hepatitis B from different sources, showing a very high level of awareness. This may be attributed to

their medical background and involvement in health-related education. Similar studies have also been shown the same situations of high awareness and low vaccination status.

Regarding knowledge, as most respondents (97.3%) correctly stated that hepatitis B is a viral infection that affects the liver indicating a solid basic knowledge of the illness. Furthermore, the majority of individuals (94.2%) accurately identified vaccination as the main preventive measure. A small percentage, however, displayed misconceptions, with some participants misidentifying exercise (1.2%) and antibiotics (2.3%) as preventive interventions. These false beliefs show that while broad knowledge is good, there are still deficiencies in certain area.

Applications of the Study

Improving Institutional Vaccination Policies

The findings can help KMU and other educational institutions develop policies that encourage or require Hepatitis B vaccination before students begin clinical rotations.

Planning Vaccination Campaigns

The study identifies low vaccination coverage despite good awareness, enabling universities and health authorities to organize targeted vaccination campaigns for Allied Health Science students.

Strengthening Health Education

The results can be used to improve educational programs by addressing misconceptions and reinforcing accurate knowledge about Hepatitis B

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transmission, prevention, and the importance of vaccination.

Enhancing Infection Prevention and Control

Since healthcare students are at increased occupational risk, the findings can support infection prevention strategies and improve compliance with standard safety precautions in clinical settings.

Protecting Future Healthcare Professionals

Increasing vaccination coverage among Allied Health Science students will reduce their risk of occupational exposure to Hepatitis B during clinical training and future professional practice.

Guiding Public Health Interventions

Public health authorities can use the study findings to design awareness programs and improve vaccine accessibility for healthcare students and other high-risk groups.

Baseline for Future Research

The study provides baseline data for future research in other universities, healthcare institutions, or provinces to compare Hepatitis B knowledge, awareness, and vaccination status among healthcare students.

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