University of Dongola

Faculty of Medicine and Surgery

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Prevalence Of Hepatitis B Vaccination Among Medical Students At University Of Dongola Northern Sudan 2026

A RESEARCH SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF BACHELOR OF MEDICINE AND HEALTH SCIENCES (MBBS)

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1. INTRODUCTION

1.1 Background

Hepatitis B virus (HBV) infection remains an important global public health problem and may lead to chronic hepatitis, cirrhosis and hepatocellular carcinoma.[1] Hepatitis B vaccination is highly effective in preventing HBV infection and is particularly important for healthcare personnel and medical students who may be exposed to blood and body fluids during clinical training. [2]

Global evidence:

Studies conducted among medical and health-science students have demonstrated considerable variation in hepatitis B vaccination coverage. In a cross-sectional study among 511 medical sciences students in Duhok, Iraq, only 18.8% were fully vaccinated with three or more doses, while 57.5% had never received the vaccine. The most commonly reported reason for non-vaccination was the lack of organized vaccination programmes. [6]

A recent study among undergraduate medical students in Tanzania found that 78.1% had received at least one dose, whereas only 42.2% had completed the full vaccination schedule. The study also identified factors such as previous information about vaccination, previous HBV testing and perceived risk of infection as being associated with vaccine uptake. [7]

Regional evidence:

Evidence from sub-Saharan Africa also demonstrates substantial variation in HBV vaccination coverage. In a study among medical students in Bosaso, Somalia, only 2.8% were fully immunized and 5.3% were partially immunized. Important reported barriers included vaccine unavailability (32.8%), high cost (26.7%), fear of adverse effects (12.6%) and lack of awareness about where to obtain the vaccine (5.7%). [8]

Similarly, a study among medicine and health-science students at Wolkite University, Ethiopia, found that only 5.8% had received the full HBV vaccination course. Vaccine unavailability and high cost were frequently reported reasons for non-vaccination. [9] Another study among health-science students in Mogadishu, Somalia, reported that 33.4% had received the full recommended vaccination doses, demonstrating that vaccination coverage remains incomplete in several African settings. [10]

Evidence from Sudan and Northern Sudan:

In Sudan, a study conducted among 426 medical students in North Sudan found that only 33.0% had received hepatitis B vaccination and only 18.6% had completed the recommended doses. [11] In addition, a study among healthcare professionals in Dongola found that 52.13% had received at least one hepatitis B vaccine dose, while

only 34.12% had completed three doses. Vaccine unavailability was reported by 93.84% of participants. [5]

1.2 Problem Statement

Hepatitis B vaccination among medical students remains suboptimal in many settings despite the availability of an effective vaccine and the occupational risk associated with clinical training. International studies have demonstrated considerable gaps in vaccination coverage. In Iraq, only 18.8% of medical sciences students were fully vaccinated, while 57.5% were unvaccinated. [6] In Tanzania, although 78.1% of medical students had received at least one dose, only 42.2% had completed the full vaccination schedule. [7]

The problem is particularly evident in several African settings. In Bosaso, Somalia, only 2.8% of medical students were fully immunized, while 5.3% were partially immunized. [8] In Ethiopia, only 5.8% of medicine and health-science students had received the full vaccination course, with vaccine unavailability and cost being important reported barriers. [9] These findings indicate that a substantial proportion of medical students may enter or continue clinical training without complete protection against HBV.

The situation in Sudan is also concerning. A study among medical students in North Sudan reported that only 33.0% had received hepatitis B vaccination and only 18.6% had completed the recommended doses. [11] Furthermore, among healthcare professionals in Dongola, 52.13% had received at least one dose and only 34.12% had completed three doses, while 93.84% reported vaccine unavailability as a barrier. [5]

Despite these findings, there is no current institution-specific estimate of the prevalence of hepatitis B vaccination among the 833 medical students at the University of Dongola, nor sufficient information regarding the factors and barriers associated with vaccination. This creates an important information gap concerning the extent of vaccination coverage and the reasons for incomplete or absent vaccination among students who may be exposed to occupational HBV risks during clinical training.

1.3 Justification

- "Health workers are at greater risk of exposure to some communicable diseases because of their contact with patients or infective material in their working environment." [1]

  Medical students are included in this occupational-risk context because clinical training may expose them to blood, body fluids, needles and other potentially infectious materials.

- "The main reasons for not receiving hepatitis B vaccination included unavailability of the vaccine, high cost, fear of vaccine side effects, lack of trust in vaccine quality, lack of awareness about where to get vaccinated, and lack of time." [8]

Therefore, identifying the reasons and barriers associated with non-vaccination or incomplete vaccination in the local setting is important for understanding the factors contributing to the observed vaccination prevalence.

- A recent study among healthcare professionals in Dongola reported that 52.13% had received at least one dose of hepatitis B vaccine, while only 34.12% had completed three doses, and vaccine unavailability was reported by 93.84% of participants. [5]

  These findings indicate an important local vaccination gap and support the need to determine the prevalence of hepatitis B vaccination specifically among medical students at the University of Dongola.

1.4 Research Question

What is the prevalence of hepatitis B vaccination among medical students at the University of Dongola Northern Sudan in 2026, and what factors are associated with vaccination status?

1.5 Research Hypotheses

H_0: There is no significant association between selected demographic, academic, clinical-exposure and access-related factors and hepatitis B vaccination status among medical students at the University of Dongola.

H_1: There is a significant association between one or more selected demographic, academic, clinical-exposure and access-related factors and hepatitis B vaccination status among medical students at the University of Dongola.

1.6 Objectives

1.6.1 General Objective

To determine the prevalence of hepatitis B vaccination among medical students at the University of Dongola, Northern Sudan, in 2026.

1.6.2 Specific Objectives

1. To determine the proportion of students who are unvaccinated, partially vaccinated and completely vaccinated.

2. To identify demographic, academic and clinical factors associated with hepatitis B vaccination status among medical students.

3. To assess the association between access to hepatitis B vaccination services and vaccination status.

2. LITERATURE REVIEW

2.1 International Evidence

HBV remains a substantial global health burden, and vaccination is the principal method of prevention. WHO identifies health workers as a group with increased exposure to communicable diseases because of contact with patients and potentially infectious materials. [1]

Naqid et al. (2023) conducted a cross-sectional study among 511 medical sciences students in Duhok, Kurdistan Region of Iraq, between November 2022 and February 2023. The study found that 18.8% of students were fully vaccinated with three or more doses, while 57.5% were unvaccinated. Lack of organized vaccination programmes was the most commonly reported reason for non-vaccination. [6]

Haile et al. (2021) conducted a cross-sectional study among 417 medicine and health-science students at Wolkite University, Ethiopia, from November to December 2020. Only 5.8% had received the full-dose HBV vaccination, while vaccine unavailability and high cost were frequently reported reasons for non-vaccination. [7]

Okeke et al. (2008) conducted a study among medical students in a Nigerian university to assess hepatitis B vaccination status and needlestick injuries. The study demonstrated the occupational importance of HBV vaccination among medical students and highlighted the risk associated with clinical exposure. [8]

2.2 Regional Evidence (Africa)

A recent study by [authors of the Tanzania study] (2026) among 343 undergraduate medical students in Tanzania found that 78.1% had received at least one dose of hepatitis B vaccine, while only 42.2% had completed the full vaccination schedule. The main reported reason for incomplete vaccination was waiting for subsequent doses (75%). The study also found significant associations between vaccine uptake and previous vaccination information, previous HBV testing, sex and perceived risk of infection. [9]

2.3 Evidence from Sudan and Local Context

Mohamed et al. (2025) conducted a multicentre cross-sectional study among 426 medical students in North Sudan from January to June 2023. The study included medical students from five universities in Northern and River Nile States, including the University of Dongola. Only 33.0% were vaccinated, while only 18.6% had received complete doses. [10]

This study is particularly important for our research because it was conducted in North

Sudan and included students from the University of Dongola, but it covered five medical colleges rather than focusing specifically on the current medical student population of the University of Dongola.

Awad et al. (2025) conducted a cross-sectional study among healthcare professionals in Dongola, Sudan, and found that 52.13% had received at least one dose of hepatitis B vaccine, whereas only 34.12% had completed three doses. Vaccine unavailability was reported as a major barrier. [5]

2.4 Knowledge Gap

The available evidence demonstrates substantial variation in HBV vaccination coverage among medical and health-science students. Naqid et al. (2023) reported low complete vaccination coverage in Iraq, while Haile et al. (2021) reported similarly low complete vaccination coverage in Ethiopia. More recent evidence from Tanzania demonstrated considerably higher vaccine initiation but still incomplete vaccination among a substantial proportion of students. [9]

In Sudan, Mohamed et al. (2025) found that only 33.0% of medical students in North Sudan had received HBV vaccination and only 18.6% had completed the recommended doses. [10] However, there remains a need for a study specifically estimating the current prevalence of HBV vaccination among the 833 currently enrolled medical students at the University of Dongola, while also examining the factors and barriers associated with vaccination.

3. MATERIALS AND METHODS

3.1 Study Design

An analytical cross-sectional institutional-based study will be conducted between September 2026 to December 2026 in the Faculty of Medicine, University of Dongola, Northern Sudan.

3.2 Study Area

The study will be conducted at the Faculty of Medicine, University of Dongola, Northern State, Sudan. The faculty has an established undergraduate medical programme with pre-clinical and clinical training. At the time of the study, there are 833 currently enrolled medical students distributed across the academic levels. The faculty has graduated 22 batches of medical students since the graduation of its first batch, reflecting an established medical education and training programme in Northern Sudan.

During clinical training, students may be exposed to patients, blood, body fluids, needles, sharps and other potentially infectious materials. The study area was therefore selected to determine the prevalence of hepatitis B vaccination among medical students and identify factors associated with vaccination status.

3.3 Study Period
September 2026 to December 2026.

3.4 Study Population
The source population will comprise all registered undergraduate medical students at the Faculty of Medicine, University of Dongola, during the 2026 academic period. The study population will consist of eligible students selected from the official student register.

3.5 Eligibility Criteria

3.5.1 Inclusion Criteria

- Registered undergraduate medical students at the University of Dongola during the study period.
- Students who are present during data collection and willing to participate.
- Students who provide informed consent.

3.5.2 Exclusion Criteria

- Students who are unsure of their vaccination status.
- Students who are unable to provide reliable information about their hepatitis B vaccination status because of a communication limitation that prevents completion of the questionnaire.

3.6 Sample Size Determination
The initial sample size will be calculated using the single population proportion formula:
$n_0 = Z^2 \times p(1-p) / d^2$
Where Z = 1.96 at 95% confidence level, p = 50% anticipated vaccination prevalence, and d = 5% margin of error.
$n_0 = (1.96)^2 \times 0.5 \times 0.5 / (0.05)^2 = 384$.
Because the total student population is finite (N = 833), the finite population correction will be applied:
$n = n_0 / [1 + (n_0 - 1)/N] = 384 / [1 + (383/833)] \approx 263$.

The finite population correction is appropriate when the total population size is known and is substantially larger than the required sample. [12]
Adding 10% for possible non-response or incomplete questionnaires: $263 \times 1.10 \approx 290$.
Therefore, the final target sample size will be approximately 290 medical students.

3.7 Sampling Technique
A stratified random sampling technique will be used. Students will first be grouped according to academic year. The required sample will be allocated proportionally to the size of each stratum. Within each stratum, eligible students will be selected using a

computer-generated random number method from the official student list.

3.7.1 Sampling Frame and Randomization Procedure

The sampling frame will consist of the official list of all 833 registered undergraduate medical students obtained from the Faculty of Medicine. After proportional allocation to each stratum, random numbers will be generated to select participants within each stratum.

3.7.2 Replacement Procedure

If a selected student refuses to participate or is unavailable after the predefined contact attempts, a replacement will be randomly selected from the same stratum using the same randomization procedure, provided that the replacement meets the eligibility criteria.

3.8 Study Variables

3.8.1 Primary Dependent Variable

Hepatitis B vaccination status: unvaccinated, partially vaccinated or completely vaccinated.

3.8.2 Secondary Outcomes

Receipt of at least one vaccine dose and complete vaccination.

3.8.3 Independent Variables

- Age and sex.
- Academic year and clinical exposure.
- Marital status.
- Socioeconomic status.
- Previous education or training concerning HBV.
- Source of HBV information.
- History of needlestick/sharps injury or blood/body-fluid exposure.
- Previous HBV testing or awareness of vaccination status.
- Access to hepatitis B vaccine and availability of vaccination services.
- Perceived barriers to vaccination, including cost, availability, fear of adverse effects, forgetfulness and lack of information.

3.8.4 Variable Measurement

Variable	Type	Measurement
Vaccination status	Dependent	Unvaccinated / partially

		vaccinated / completely vaccinated
Received ≥1 dose	Outcome	Yes / No
Complete vaccination	Outcome	Yes / No
Age	Independent	Completed years
Sex	Independent	Male / Female
Academic year	Independent	Academic level
Clinical exposure	Independent	Yes / No
Needlestick injury	Independent	Yes / No
Socioeconomic status	Independent	Predefined socioeconomic categories
Previous HBV education	Independent	Yes / No
Access to vaccination	Independent	Available / not available
Previous HBV testing	Independent	Yes / No
Barriers to vaccination	Independent	Predefined categories

3.9 Operational Definitions

Hepatitis B vaccination: Receipt of one or more doses of hepatitis B vaccine intended to prevent HBV infection, as reported by the participant or verified from available vaccination documentation.

Vaccination status: The participant's HBV vaccination status classified according to the number of doses received as unvaccinated, partially vaccinated or completely vaccinated.

Unvaccinated: A participant who reports receiving no dose of hepatitis B vaccine.

Partially vaccinated: A participant who has received at least one but fewer than the doses required to complete the primary hepatitis B vaccination series.

Completely vaccinated: A participant who has received all doses required to complete the applicable primary vaccination series. For the conventional adult health-care-worker schedule, this is three doses.

Vaccination prevalence: The proportion of study participants who have received at least one dose of hepatitis B vaccine, calculated as the number vaccinated divided by the total number of participants × 100.

Complete vaccination prevalence: The proportion of participants who have completed the primary vaccination series, calculated as the number completely vaccinated divided by the total number of participants × 100.

3.10 Data Collection Tool

Data will be collected using a structured, self-administered questionnaire adapted and modified from a previously validated questionnaire used among medical sciences students. The questionnaire will be adapted to the objectives and context of the present study, particularly the assessment of vaccination prevalence, vaccination completion and factors and barriers associated with vaccination. [4]

3.11 Measurement and Scoring

The primary outcome is hepatitis B vaccination status; therefore, the prevalence analysis does not require a knowledge or attitude score. Vaccination status will be classified directly according to the number of vaccine doses received.

Vaccination prevalence will be calculated as: number of participants who received ≥1 dose ÷ total number of participants × 100. Complete vaccination prevalence will be calculated as: number of participants who completed the applicable primary series ÷ total number of participants × 100.

Where knowledge or attitude items are retained only as explanatory variables, they will be scored according to the published instrument from which the questionnaire is adapted. The relevant published North Sudan medical-student instrument used a 70% threshold for categorizing scores. [11] Any modified scoring system will be pilot-tested and documented before analysis.

3.12 Validity and Reliability

Content validity will be assessed by the research supervisors and experts in community medicine/public health and infectious diseases. The questionnaire will be adapted from published instruments and modified to suit the study objectives and local context. Pre-testing will identify unclear or ambiguous questions. Where multi-item scales are retained, internal consistency will be assessed using Cronbach's alpha and the final value will be reported.

3.13 Data Collection Procedure

Data will be collected using the structured self-administered questionnaire. The researchers and/or trained data collectors will distribute questionnaires to selected students according to the sampling list. Data collectors will receive standardized instructions regarding recruitment, informed consent, questionnaire administration, confidentiality and handling of completed questionnaires. The researchers will supervise data collection and review completed questionnaires regularly for completeness and consistency.

3.14 Pilot Study and Pre-testing

A pilot study will be conducted among approximately 5–10% of the estimated sample size among medical students who will not be included in the final sample. The pilot will assess clarity, acceptability, completion time and feasibility of sampling and data collection. Unclear questions and procedures will be revised before the main study. Pilot data will not be included in the final analysis.

3.15 Data Quality Control

- The questionnaire will be reviewed by supervisors and subject experts before use.
- The questionnaire will be pre-tested and revised for clarity and consistency.

- Data collectors, if used, will receive standardized instructions.
- Completed questionnaires will be checked daily for completeness.
- Data entry will include range and consistency checks.
- A proportion of entered records will be cross-checked against the original questionnaires.

3.16 Data Handling and Management

Each questionnaire will be assigned a unique identification code rather than the participant's name. A coding scheme will be developed before data entry. Completed questionnaires will be reviewed for completeness before entry. Data will initially be entered into Microsoft Excel 2021 and subsequently imported into IBM SPSS Statistics version 31 for analysis. Range, consistency and missing-value checks will be performed after data entry. A randomly selected proportion of records will be compared with the original questionnaires to identify data-entry errors. Electronic data will be password protected and stored on a secure computer accessible only to the research team.

3.17 Data Analysis Plan

Data analysis will be conducted according to the specific objectives. Objective 1: the proportion receiving at least one dose will be calculated using frequencies and percentages. Objective 2: complete vaccination prevalence will be calculated using frequencies and percentages. Objective 3: vaccination status will be presented as unvaccinated, partially vaccinated and completely vaccinated. Objective 4: associations between vaccination status and demographic, academic and clinical factors will be assessed using the Chi-square test or Fisher's exact test when appropriate. Objective 5: associations between access to vaccination services and vaccination status will be assessed using appropriate categorical tests.

Binary logistic regression will be performed where appropriate to identify factors independently associated with complete vaccination. Crude and adjusted odds ratios with 95% confidence intervals will be reported. A p-value <0.05 will be considered statistically significant. Continuous variables will be summarized using means and standard deviations or medians and interquartile ranges as appropriate, and appropriate parametric or non-parametric tests will be selected according to data distribution.

3.17.1 Proposed Dummy Tables

Table 1. Socio-demographic and academic characteristics

Variable	Frequency	Percentage
Age group		
Sex		
Academic year		
Clinical phase		

Socioeconomic status		

Table 2. Hepatitis B vaccination status

Vaccination status	Frequency	Percentage
Unvaccinated		
Partially vaccinated		
Completely vaccinated		

Table 3. Factors associated with vaccination status

Factor	Vaccinated n (%)	Unvaccinated n (%)	P-value
Academic year			
Clinical exposure			
Socioeconomic status			
Access to vaccine			

Table 4. Factors associated with complete vaccination

Factor	Crude OR	Adjusted OR	95% CI	P-value
Academic year				
Clinical exposure				
Access to vaccine				
Socioeconomic status				

3.18 Potential Sources of Bias and Their Control

Selection bias: minimized by using the official student register, stratified sampling and random selection within each stratum.

Non-response bias: minimized by explaining the study, maintaining voluntary participation, and including a non-response allowance in the sample size. Replacements, when necessary, will be randomly selected from the same stratum.

Information bias: vaccination status and exposure may be self-reported. This will be minimized by standardized questions and, where available and ethically appropriate, allowing participants to refer to vaccination records.

Recall bias: participants may have difficulty remembering previous vaccine doses. The questionnaire will request documented information where available.

Confounding: academic year, clinical exposure, socioeconomic status and access to vaccination may confound associations. Potential confounding will be assessed using stratification and multivariable logistic regression where appropriate.

4. ETHICAL CONSIDERATIONS

Ethical approval will be obtained from the Research Ethics Committee, Ministry of Health, Northern Sudan before data collection.

Administrative permission will be obtained from the Faculty of Medicine and relevant authorities.

Written informed consent will be obtained from each participant before participation.

Participation will be voluntary. Refusal or withdrawal will not affect the student's academic status or access to university services.

No unnecessary personal identifiers will be collected. Questionnaires will be coded to protect confidentiality.

Data will be stored securely and accessed only by the research team.

Results will be reported in aggregate form so that individual students cannot be identified.

The study will not provide clinical diagnosis or treatment. Students requesting vaccination information will be directed to appropriate vaccination or occupational-health services.

5. STUDY MANAGEMENT

The principal investigators will coordinate questionnaire preparation, recruitment and supervision of data collectors, data collection, data management, analysis and preparation of the final report. The research supervisor will provide academic and methodological supervision throughout the study.

The researchers will ensure compliance with the approved research protocol and document any major deviation. Problems encountered during recruitment, data collection or data management will be discussed with the supervisor and addressed appropriately.

All study materials will be maintained securely. Research data will be used only for the approved research purposes, and data ownership will follow applicable University of Dongola regulations.

5.1 Quality Assurance

Quality assurance will be maintained throughout all stages of the study. The questionnaire will be reviewed by supervisors and relevant experts, pre-tested before the main study, and revised accordingly. Data collectors will receive standardized training. Completed questionnaires will be checked regularly for completeness and consistency. Data entry will be followed by range, consistency and missing-value checks, and selected records will be cross-checked against the original questionnaires.

6. WORK PLAN AND TIMELINE

The proposed work plan is summarized below. Dates may be adjusted according to ethical approval, academic schedules and field conditions.

Activity	Wk 1 sep 24–30	Wk 2 oct 1–7	Wk 3 oct 8–15	Wk 4 oct 16–24	Wk 5 oct 25–31	Wk 6 Nov 1-7	Wk 7 Nov 8-15	Wk 8 Nov 16-24	Wk 9 Nov 25-30
Proposal writing									
Literature review									
Data Collection									
Data Analysis									
Discussion and Recommendation									
Report writing									
Final Submission									

7. RESOURCES REQUIRED

7.1 Available Resources

- University of Dongola Faculty of Medicine facilities.
- Official student registration lists.
- Researchers' computers.
- Microsoft Excel 2021.

- IBM SPSS Statistics version 31.
- Internet access and academic supervision.

7.2 Required Resources

- Printed questionnaires.
- Local transportation for data collection.
- Internet/data and communication.
- Stationery and photocopying.
- Computer/data-entry requirements.
- Miscellaneous research expenses.

8. BUDGET OUTLINE

Item	Estimated quantity	Estimated unit cost (SDG)	Estimated total (SDG)
Questionnaire printing and photocopying	290 copies	150	45,000
Local transportation for data collection	1 lot	10,000	100,000
Internet/data and communication	1 lot	50,000	50,000
Data entry/typing and miscellaneous computer costs	1 lot	50,000	50,000
Total estimated budget			245,000

9. REFERENCES

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10. APPENDICES

The final questionnaire will be adapted from published instruments concerning hepatitis B vaccination among medical and health-science students, including relevant items from the North Sudan study. [13]

Appendix A: Questionnaire

Title: Prevalence of Hepatitis B Vaccination Among Medical Students at University of Dongola, Northern Sudan 2026

Section A: Socio-demographic and Academic Information

1. Age: ____ years

2. Sex: Male / Female

3. Academic year: ____

4. Pre-clinical / Clinical phase

5. Marital status: Single / Married / Other

6. Father's education: ____

7. Mother's education: ____

8. Father's occupation: ____

9. Mother's occupation: ____

10. Estimated family income: ____

Section B: Hepatitis B Vaccination Status

1. Have you ever received hepatitis B vaccine? Yes / No

2. Number of doses received: 0 / 1 / 2 / 3 / Other

3. Have you completed the vaccination course? Yes / No / Don't know

4. Do you have a vaccination card/record? Yes / No

5. Where did you receive the vaccine? ____

6. When did you receive your most recent dose? ____

Section C: Clinical Exposure and Occupational Risk

1. Have you started clinical training? Yes / No

2. Have you had a needlestick/sharps injury? Yes / No

3. Have you experienced blood/body-fluid exposure? Yes / No

4. Have you previously worked or trained in a healthcare setting? Yes / No

Section D: Access and Barriers

1. Is hepatitis B vaccine available to students? Yes / No / Don't know

2. Have you ever tried to obtain the vaccine? Yes / No

3. Was the vaccine available when you tried to obtain it? Yes / No

4. Did cost prevent vaccination? Yes / No

5. Did lack of information prevent vaccination? Yes / No

6. Did fear of adverse effects prevent vaccination? Yes / No

7. Did forgetfulness prevent completion? Yes / No

8. Other reason: _____

Appendix B: Variable List and Definitions

Variable	Operational measure	Coding
Vaccination status	Number of HBV vaccine doses	0=unvaccinated; 1–2=partial; 3=complete
Received ≥1 dose	Any dose received	Yes/No
Complete vaccination	Primary series completed	Yes/No
Clinical exposure	Clinical training/patient care	Yes/No
Socioeconomic status	Predefined household indicators	Low/medium/high or final validated categories
Access to vaccine	Ability to obtain vaccine	Available/not available

Appendix C: Informed Consent Form

You are invited to participate in a research study entitled “Prevalence of Hepatitis B Vaccination Among Medical Students at University of Dongola, Northern Sudan 2026.”
The purpose of this study is to determine the prevalence of hepatitis B vaccination and factors associated with vaccination status among medical students.
Participation is voluntary. You may refuse to participate or withdraw at any time without any academic or other penalty. The information collected will be kept confidential and used only for research purposes. No unnecessary personal identifiers will be collected.
By signing below, I confirm that the study has been explained to me and that I voluntarily agree to participate.
Participant code: _____
Signature: _____
Date: _____

Appendix D: Introductory Letter

Dear Student,
We are conducting a research study entitled “Prevalence of Hepatitis B Vaccination Among Medical Students at University of Dongola, Northern Sudan 2026.”
The purpose of this study is to determine hepatitis B vaccination prevalence and

selected associated factors among medical students. You are invited to participate by completing the attached questionnaire. Participation is voluntary, and the information provided will be kept confidential and used only for research purposes. You may decline or withdraw without any effect on your academic status.

Thank you for your cooperation.

Researchers: Rahaf Abdalhamed Saeed Salih and Mason Mohammed Ameen Fakher Aldeen

Supervisor: Dr. Nora Altayeb Abdulkareem Hussein

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