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Factors associated with medical students' intentions to get vaccinated against hepatitis B at Joseph Ki-Zerbo University according to the Theory of Planned Behavior in 2024.

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(Burkina Faso)

Abstract

According to the WHO, global vaccination coverage against hepatitis B is 39%, while in Burkina Faso it remains particularly low among health sciences students (6%). This low vaccination coverage, combined with the high prevalence of hepatitis B virus infection in Burkina Faso (9.1%), raises major concerns among health sciences students in general and medical students in particular. The overall objective was to study the factors associated with medical students' intention to get vaccinated against hepatitis B at Joseph Ki-Zerbo University in 2024. This was a quantitative cross-sectional study conducted from June 2024 to June 2025 among 770 medical students in their first through seventh years, selected through stratified random sampling based on year of study. Data were collected using a structured self-administered questionnaire. The results reveal that 47.79% of students were fully vaccinated. Subjective norms alone influence the intention to get vaccinated against hepatitis B (OR=2.98; p=0.031). Regarding behavioral variables, 50.2% had a positive attitude, 52.5% had favorable subjective norms, 56.7% had good perceived behavioral control, and 93% had a strong intention. Subjective norms appear to be the factors that can positively influence the intention to get vaccinated in our study. Future research could explore the development and acceptability of interventions based on subjective norms.

Keywords: Hepatitis B, Vaccination intention, Medical student, Theory of Planned Behavior, Burkina Faso

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INTRODUCTION

According to the World Health Organization (WHO), chronic hepatitis B is characterized by a persistent infection with the hepatitis B virus (HBV), confirmed by the prolonged presence of hepatitis B surface antigen (HBsAg) in the blood or serum for more than six months. This infection can occur with or without active viral replication, signs of inflammation, or liver cell damage (WHO, 2017).

Worldwide, chronic hepatitis B virus (HBV) infection represents a major public health challenge, as it affects more than 2 billion people who have been exposed to the virus, of whom more than 350 million are chronic carriers (Nankya-Mutyoba et al., 2019). According to the World Health Organization, the global prevalence of this infection is estimated at 3.5%, with approximately 887,000 deaths each year (WHO, 2017). Its complications primarily affect young, working-age populations, thereby compromising the economic development of vulnerable countries (Si et al., 2019).

Africa accounts for approximately 70% of the world's hepatitis B cases (WHO Regional Office for Africa, 2024). Chronic hepatitis B affects approximately 82 million people, with a seroprevalence of 6.1% and 80,000 deaths in 2019 (Spearman et al., 2023).

In Burkina Faso, the 2010 Demographic and Health Survey found a national HBV seroprevalence of 9.1%, with approximately 1.9 million people affected (Meda et al., 2018). This prevalence classifies Burkina Faso as a country with high HBV endemicity (>8%) (Meda et al., 2018; WHO, 2017).

According to the WHO, global vaccination coverage against hepatitis B stands at 39% (WHO, 2017), while in Burkina Faso it remains particularly low among health sciences students, at only 6% (Sombié et al., 2016). The prevalence of hepatitis B virus (HBV) infection is estimated at 7.4% among healthcare workers (Zida et al., 2023). The low vaccination coverage mentioned above, combined with the high prevalence of HBV, raises a major concern among future healthcare

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professionals, namely medical students. Indeed, medical students are a high-risk population due to their frequent exposure to body fluids and invasive procedures (specimen collection, venipuncture, surgical suturing, etc.) during their clinical training.

In Burkina Faso, to date, according to our research, no specific study has been conducted to understand the factors that may influence medical students' decision to get vaccinated. This study aimed to fill this gap by exploring the factors associated with the intention to get vaccinated in this population.

The main research question was whether there were factors associated with the intention of medical students at Joseph Ki-Zerbo University to get vaccinated against hepatitis B in 2024.

The overall objective of this study was to examine the factors associated with medical students' intention to get vaccinated against hepatitis B at Joseph Ki-Zerbo University in 2024. Specifically, it aimed to determine the proportion of students vaccinated against hepatitis B; to assess attitudes; to determine subjective norms; to evaluate perceived behavioral control; and to identify the sociodemographic and behavioral factors among medical students at Joseph Ki-Zerbo University associated with the intention to get vaccinated against hepatitis B in 2024.

I. METHODOLOGY

Our study was conducted at Joseph Ki-Zerbo University, located in Ouagadougou, Burkina Faso. The total number of students in 2024 was 4,398, including 3,161 in medicine, 1,055 in pharmacy, 143 in dental surgery, and 139 in advanced health technician programs.

This was a quantitative cross-sectional study conducted from June 2024 to June 2025. The study population consisted of medical students at Joseph Ki-Zerbo University enrolled in various years of study in 2024.

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Included in this study were students aged 18 or older enrolled in medical school from the 1st to the 7th year at Joseph Ki-Zerbo University in 2024 who were present at the time of the survey and who gave their consent to participate in the study.

We used Cochran's formula to determine the size of our sample:

$$n = \frac{Z^2 \times p\ (1 - p)}{E^2}$$

- n = sample size.

- Z = critical value corresponding to the chosen confidence level. We used a 95% confidence level, so Z ≈ 1.96.

- p = estimate of the proportion we expect to find in our sample. Here, p was set to 0.5 because this value yields the largest required sample size.

- 1-p = probability of not finding the characteristic we want to study

- E = margin of error 5%

Based on this formula, the sample size required to estimate a proportion with a 95% confidence level and a 5% margin of error (assuming p = 0.5) was approximately 385. The number of subjects required for the study was n = 385; we increased this by 100%, resulting in 770 subjects.

A stratified random sampling method was used to ensure adequate representation of students enrolled in 2024 (grades 1 through 7). The study population was therefore divided into homogeneous groups called strata. These strata were created based on academic levels: Bachelor's 1, Bachelor's 2, Bachelor's 3, Master's 1, Master's 2, Doctorate 1, Doctorate 2. Random samples from each stratum were selected in numbers proportional to the size of the stratum relative to the study population within each stratum.

The variables examined were those related to intention, attitude, subjective norms, perceived behavioral control, and sociodemographic variables.

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Data were collected using a structured, self-administered questionnaire. The questionnaire was designed based on the Theory of Planned Behavior (TPB) and included sociodemographic characteristics, attitudes, subjective norms, perceived control, and behavioral intention regarding hepatitis B vaccination.

The questionnaire was pre-tested with a small group of students to ensure its clarity and relevance. Class representatives were contacted to obtain the course schedules for the various classes in order to conduct the data collection.

The limitations of this study stemmed, on the one hand, from the fact that it was a cross-sectional study. On the other hand, there was a limitation related to the Theory of Planned Behavior. Indeed, this theory does not take into account certain aspects, such as individual personality.

The collected data were analyzed using SPSS version 25. The analysis consisted of three parts. First, we conducted univariate analyses to determine frequencies, percentages, means, and standard deviations. Next, we conducted bivariate analyses to examine the associations between categorical variables (e.g., intention to get vaccinated and year of study). Finally, we performed multivariate analyses (logistic regressions) to identify predictors of hepatitis B vaccination, taking into account the independent variables derived from the TCP.

The study protocol was approved by the faculty advisors of the IFRISS Master's program in Public Health. We obtained authorization to collect data from the administration of the UFR SDS at Joseph Ki-Zerbo University. Informed consent was obtained from all participants. The information collected was treated confidentially. The questionnaires were anonymous, and the data were coded to ensure the confidentiality of the participants.

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II. RESULTS

II.1. Sociodemographic data

The results we obtained from the UJKZ medical students who participated in the study are described below. The study participants consisted of 337 female students (43.8%) and 433 male students (56.2%). The average age was 23.08 years, ranging from 18 to 33 years. The 18–25 age group was the most represented, accounting for 76.8%. Burkinabé nationals were the most represented, accounting for 94.4%, compared to 5.6% for other nationalities. The most represented cohort was first-year students, at 24%, and the least represented was first-year master's students, at 8.1% of participants. Ninety-one-point six percent (91.6%) of the participants were single. In our study, the percentage of participants in the low-income bracket was 23.5%, in the middle-income bracket was 18.7%, and in the high-income bracket was 57.8%. The Central region had the highest number of participants at 68.3%, while the Sahel region was the least represented with 0.9% of participants. The most common religion among participants was Christianity at 49.7%, followed by Islam at 48.3%. Other religions accounted for 1% of participants. Participants whose fathers had no formal education accounted for 33.5%. Those whose fathers had completed primary school accounted for 16.4%. Fathers with a secondary or tertiary education level accounted for 23.6% and 26.5%, respectively. Regarding the mother's educational level, 41.7% of participants had mothers who were illiterate, 13.8% had mothers with a primary education, 32.3% had mothers with a secondary education, and 12.2% had mothers with a university education. Seventy-one-point nine percent (71.9%) did not live in a household where a family member or acquaintance had hepatitis B. In contrast, 28.1% of students reported living in a household where a family member or acquaintance had hepatitis B.

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II.2. Percentage of vaccinated students

Figure 1 shows the percentage of UJKZ medical students vaccinated against hepatitis B in 2024.

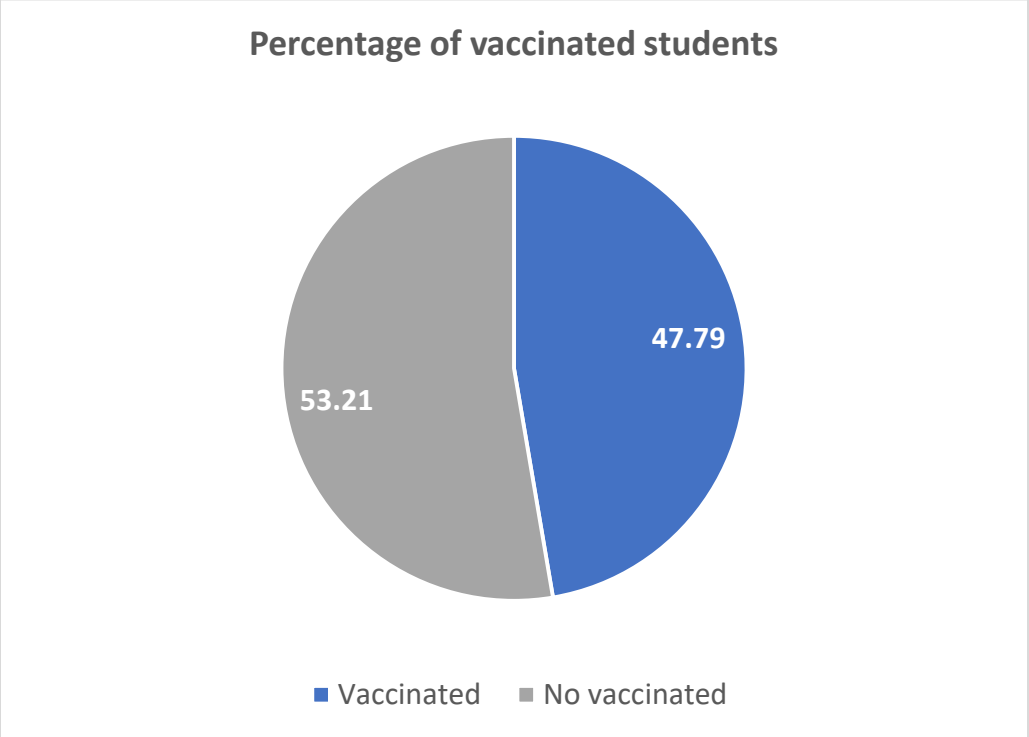

Figure 1: Percentage of UJKZ medical students vaccinated against hepatitis B in 2024

Source: Analysis of data from our study

Of the 770 students, 402 were unvaccinated, and 368 were fully vaccinated against hepatitis B, representing 47.79%

II.3. Behavioral Data

Students who had been fully vaccinated were not surveyed regarding behavioral variables. There were 368 such students, compared to 402 unvaccinated students. The behavioral variables therefore pertained to the 402 unvaccinated students.

It should also be noted that the analyses of behavioral variables were conducted based on the students' degree of agreement or disagreement with the statements of the variable in question, using a Likert scale ranging from 1 to 5.

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II.3.1. Statistical parameters of the various behavioral variables

We noted that the attitude score ranged from 36 to 75, with a median of 59. The score for subjective norms ranged from 21 to 40, with a median of 35. As for the perceived behavioral control score, it ranged from 31 to 61, with a median of 44.

Table I presents the statistical parameters for the various behavioral variables.

Table I: Statistical parameters for the various behavioral variables

Variable	Mean	Standard Deviation	Min	Max	Median
Attitude	**58,82**	**52,2**	**36,00**	**75,00**	**59,00**
Subjective norms	**34,31**	**4,20**	**21,00**	**40,00**	**35,00**
Perceived behavioral control	**44,63**	**5,37**	**31,00**	**61,00**	**44,00**

Source: Analysis of data from our study

II.3.2. Distribution of Ratings for Behavioral Variables

Attitude: A students' attitude was considered good if their score on all attitude-related questions was greater than or equal to the median (score ≥59), and it was considered poor if the score was less than the median (score <59). There were 202 students with a positive attitude in our study, representing 50.2% of the students.

Subjective norms: Subjective norms were considered favorable if a student's score on all questions regarding subjective norms was greater than or equal to the median (score ≥35), and unfavorable if the score was less than the median (score <35). There were 211 students in our study who had favorable subjective norms, representing 52.5% of the students.

Good perceived behavioral control: Perceived behavioral control was considered good if, across all questions regarding perceived behavioral control, a student scored at or above the median (score ≥44), and it was considered poor if the score was below the median (score < 44). There were 228 students in our study with good perceived behavioral control, representing 56.7% of the students.

The results of the distribution of the assessment of the behavioral variables studied among these students regarding hepatitis B vaccination in 2024 are presented in Table II.

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Table II: Distribution of attitudes toward the behavioral variables studied among UJKZ medical students regarding hepatitis B vaccination in 2024

Variables	Sample size	Frequency (%)
Attitude		
Negative	200	49,8
Positive	202	50,2
Subjective norms		
Unfavorable	191	47,5
Favorable	211	52,5
Perceived behavioral control		
Low	174	43,3
High	228	56,7
Intention to get vaccinated		
No	28	7,0
Yes	374	93,0
Total	**402**	**100**

Source: Analysis of data from our study

II.3.3. My primary source of information

Teachers ranked first as the primary source of information (37.3%). Parents, friends, family, and colleagues ranked second at 24.1%, while radio, television, and social media ranked third at 25.6%.

Table III shows the distribution of reference persons among UJKZ medical students regarding hepatitis B vaccination in 2024

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Table III: Distribution of reference persons among UJKZ medical students regarding hepatitis B vaccination in 2024

Variables	Sample size	Frequency (%)
Parents, Family, Friends, and Colleagues	97	24,1
Teachers	150	37,3
Broadcast Media and social media	103	25,6
Other	52	12,9
Total	**402**	**100,0**

Source: Analysis of data from our study

II.4. Bivariate analysis

Factors associated with the intention to get vaccinated against hepatitis B among medical students at UJKZ regarding hepatitis B vaccination in 2024

II.4.1. Factors associated with age, gender, nationality, academic level, and intention to get vaccinated against hepatitis B.

There was no statistically significant association between age, gender, nationality, academic year, and intention to get vaccinated against hepatitis B.

Table IV shows the relationship between sociodemographic characteristics and the intention to get vaccinated against hepatitis B among UJKZ medical students in 2024.

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Table IV: Relationship between sociodemographic characteristics and the intention to get vaccinated against hepatitis B among UJKZ medical students in 2024.

Variables	%	Odds-Ratio	IC 95%	P-value (≤0,05)
Age				
[18–25]	76,8	Ref	0,48 – 4,26	0,514
[25–33]	23,2	1,44		
Gender				
Male	56,2	Ref	0,68 – 4,01	0,254
Female	43,8	1,66		
Nationality				
Burkinabe	94,4	Ref		
Other nationality	5,6	0,73	0,16 – 3,32	0,690
Level of education				
Bachelor's 1	24	Ref		
Bachelor's 2	13	0,47	0,14 – 1,41	0,174
Bachelor's 3	8,1	0,51	0,14 – 1,85	0,302
Master's 1	10	2,05	0,24 – 17, 26	0,500
Master's 2	9,0	0,40	0,11 – 1,49	0,163
Doctorate 1	20	4,34	0,52 – 36,04	0,139
Doctorate 2	16	0,52	0,14 – 1,90	0,323

Source: Analysis of data from our study

II.4.2. Factors associated with income level, marital status, place of residence, region, religion, and intention to get vaccinated against hepatitis B.

There was no statistically significant association between income level, marital status, place of residence, region, religion, and intention to get vaccinated against hepatitis B.

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Table V shows the relationship between sociodemographic characteristics and the intention to get vaccinated against hepatitis B among medical students at UJKZ in 2024.

Table IV: Relationship between sociodemographic characteristics and the intention to get vaccinated against hepatitis B among medical students at UJKZ in 2024

Variables	%	Odds-Ratio	IC 95%	P-value (≤0,05)
Income Level				
Low	23,5	Ref		
Medium	18,7	1,31	0,46 – 3,70	0,605
High	57,8	1,80	0,75 – 4,21	0,179
Marital Status				
Single	91,6	Ref		
Married	8,4	0,41	0,13 – 1,28	0,116
Place of Residence				
University Housing	2,7	Ref		
Private Rental	19,7	0,71	0,08 – 6,16	0,759
Shared Housing	10,9	0,87	0,09 – 8,47	0,908
With Family	66,6	1,09	0,13 – 8,89	0,932
Region				
Central	68,3	Ref		
Other	21,7	0,59	0,27 – 1,29	0,184
Religion				
Christian	49,7	Ref		
Muslim	48,3	1,75	0,08 – 3,85	0,157
Other	1	1,02	1,00 – 1,04	0,528

Source: Analysis of data from our study

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II.4.3. Factors associated with the father's educational level, the mother's educational level, and the intention to get vaccinated against hepatitis B.

There was no statistically significant association between the father's educational level, the mother's educational level, and the intention to get vaccinated against hepatitis B.

Table VI shows the relationship between parent's sociodemographic characteristics and the intention to get vaccinated against hepatitis B among UJKZ medical students in 2024.

Table VI: Relationship between parent's sociodemographic characteristics and the intention to get vaccinated against hepatitis B among UJKZ medical students in 2024.

Variables	%	Odds-Ratio	IC 95%	P-value (≤0,05)
Father's educational level				
Illiterate	33,5	Ref		
Elementary	16,4	0,89	0,32 – 2,45	0,825
High school	23,6	1,55	0,48 – 4,92	0,453
College	26,5	1,42	0,49 – 4,14	0,511
Mother's educational level				
Illiterate	41,7	Ref		
Elementary	13,8	0,66	0,22 – 1,94	0,457
High school	32,3	1,20	0,45 – 3,23	0,707
College	12,2	0,64	0,17 – 2,37	0,501

Source: Analysis of data from our study

II.4.4. Factors associated with being part of a Hepatitis B-positive family, attitude, subjective norm, perceived importance of a reference person's opinion, perceived behavioral control, and intention to get vaccinated against hepatitis B

Subjective norms and the importance of the reference person's opinion were statistically associated (P-value ≤ 0.05) with the intention to get vaccinated against hepatitis B among UJKZ medical students in 2024. These factors were therefore included in the final model.

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Table VII shows the relationship between the various study variables and the intention to get vaccinated against hepatitis B among UJKZ medical students in 2024.

Table VII: Relationship between the various study variables and the intention to get vaccinated against hepatitis B among UJKZ medical students in 2024

Variables	%	Odds-Ratio	IC 95%	P-value (≤0,05)
Family history of Hepatitis B				
No	71,9	Ref		
Yes	28,1	0,85	0,35 – 2,09	0,737
Attitude				
Poor	49,8	Ref		
Good	50,2	1,62	0,74 – 3,55	0,224
Subjective norms				
Unfavorable	47,5	Ref		
Favorable	52,5	2,98	1,28 – 6,94	**0,008***
Importance of my mentor's opinion				
Not important	11,9	Ref		
Important	89,1	3,33	1,37 – 8,05	**0,005 ***
Perceived behavioral control				
Poor	43,3	Ref		
Good	56,7	1,15	0,53 – 2,49	0,716

Source: Analysis of data from our study

* Level of statistical significance

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II.5. Multivariate analysis

Variables with a statistically significant association with the intention to get vaccinated against hepatitis B (P value ≤0.05) were included in the multivariate analysis.

Subjective norms were the factors significantly associated (P-value ≤ 0.05) with the intention to get vaccinated against hepatitis B among UJKZ medical students in 2024. Students with favorable subjective norms were three times more likely to intend to get vaccinated against hepatitis B.

Table VIII presents the results of the multivariate analysis of associations between the intention to get vaccinated against hepatitis B and study factors among UJKZ medical students in 2024.

Table VIII: Multivariate analysis of associations between the intention to get vaccinated against hepatitis B and study factors among UJKZ medical students in 2024.

Variables	Odds-Ratio	IC 95%	P-value (<0,05)
Subjective standard			
Unfavorable	Ref		
Favorable	2,98	1,28 – 6,94	**0,031**
Importance of my supervisor's opinion			
Not important	Ref		
Important	3,04	1,00 – 9,25	0,618

Source: Analysis of data from our study

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III. Discussion

III.1. Presentation of the main results

Our study found that 47.79% of students had been vaccinated against hepatitis B. It also found that 50.2% of students had a positive attitude toward hepatitis B vaccination; 52.5% held favorable subjective norms; and 56.7% reported good perceived behavioral control. This study also contributed to identifying factors associated with the intention to get vaccinated against hepatitis B among medical students at UJKZ in 2024. Subjective norms are the factors significantly associated (P-value ≤ 0.05) with the intention to get vaccinated against hepatitis B among UJKZ medical students in 2024.

III.2. Interpretation of Results

III.2.1. Proportion of Students Vaccinated Against Hepatitis B

The proportion of students vaccinated against hepatitis B was 47.79%. Although this proportion is nearly similar to that in Uganda, where it was reported that 44.3% of medical students were fully vaccinated against hepatitis B (Wibabara et al., 2019), is far lower than the global vaccination coverage estimated by the WHO in 2023 at 83% (WHO, 2024).

For medical students, the vaccination rate of 47.78% is relatively low, especially given their increased risk of exposure to the virus (Adjei Gyimah et al., 2021). More than half of the medical students at Joseph Ki Zerbo University have therefore not been vaccinated against hepatitis B, which is truly very concerning. Indeed, the lack of vaccination among medical students is a major cause for concern, both for their own health and for that of the patients they care for. As future healthcare professionals, they face a higher risk of exposure to blood and bodily fluids, particularly during medical procedures and hospital rotations (Adjei Gyimah et al., 2021). The hepatitis B virus is extremely contagious and can cause severe complications, including fulminant hepatitis, cirrhosis, or hepatocellular carcinoma (Sombié et al., 2016). However, vaccination provides effective protection, with an efficacy rate exceeding 95% when administered correctly (Ministry of Health of Burkina Faso, 2021).

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Several factors may explain why more than half of the students are not vaccinated: the cost and accessibility of the vaccine, the absence of a strict institutional requirement for vaccination prior to hospital rotations, a lack of awareness regarding the risks of HBV, as well as psychological and behavioral barriers, such as perceptions of social norms and perceived control over vaccination, as explained by the theory of planned behavior.

The proportion of medical students vaccinated against hepatitis B, although higher than that found among health sciences students at Joseph Ki Zerbo University in Ouagadougou (6%) (Sombié et al., 2016), in Iraq (18.8%) (Naqid et al., 2023), in Ethiopia (5.8%) (Haile et al., 2021), and in Senegal (37.6%) (Lebem et al., 2024), it highlights the need to intensify awareness-raising efforts regarding the importance of vaccination and to implement strategies that facilitate access to it. It would be appropriate to integrate vaccination into the university curriculum, make it mandatory (following educational and motivational support) for access to hospital internships, and ensure systematic vaccination follow-up. It is also crucial to note that full immune protection requires three doses of the vaccine, followed by a check of anti-HBs antibody levels of at least 10 IU to verify immunization (Ministry of Health of Burkina Faso, 2021).

The fact that medical students are not vaccinated against hepatitis B is therefore a public health issue requiring rapid action, both at the institutional and individual levels (Nguyen et al., 2023). This is all the more crucial if we wish to achieve the WHO's goal of eliminating hepatitis B as a major public health threat by 2030 (WHO, 2016).

III.2.2. Student Attitudes Toward Vaccination

The study revealed that 50.2% of students had a positive attitude toward hepatitis B vaccination. Through the courses they take and the practical experience they gain during clinical rotations, medical students are expected to have a better understanding of public health issues, including the necessity of hepatitis B vaccination. With 50.2% of students holding positive attitudes, the results indicate moderate acceptance of vaccination, which is concerning in a high-risk environment. From a cognitive perspective, although medical students have access

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to information, gaps remain in their knowledge of exposure risk, complications of chronic hepatitis B, and vaccination recommendations. Regarding beliefs and perceptions, fear of side effects, underestimation of personal risk, and the circulation of misinformation could negatively influence attitudes toward vaccination uptake. However, a hesitant or negative attitude toward vaccination may influence students' future practice. They may not actively promote vaccination among their patients, which could undermine public health efforts (Acikgoz et al., 2021).

The attitude of medical students toward hepatitis B vaccination with 50.2% exhibiting positive attitudes also raises several questions regarding the effectiveness of awareness campaigns and the knowledge about the hepatitis B vaccine acquired through university courses. This situation suggests that awareness campaigns and theoretical instruction are not sufficient to generate strong support for vaccination and that a more interactive and practical approach may be necessary.

Indeed, clinical scenarios and role-playing exercises can be used (organizing sessions where students play the role of healthcare providers dealing with a patient with hepatitis B or a blood exposure incident (BEI). This type of simulation raises awareness of the real risk and the importance of vaccination).

Another strategy could involve testimonials from patients with hepatitis B (Invite patients living with chronic hepatitis B to share their experiences, particularly regarding complications such as cirrhosis and liver cancer. This reinforces the emotional impact and perception of risk).

In addition, we have vaccination campaigns that actively involve students (directly engaging students in vaccination days, either as volunteers or even as recipients). When students themselves participate in the implementation, they are more likely to get vaccinated.

We should also note the challenges and rewards between cohorts (organizing a competition between different cohorts with vaccination coverage targets and symbolic rewards, such as certificates or academic recognition). A gamified approach can improve attitudes.

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Integrating vaccination into clinical evaluations can also be a strategy (requiring up-to-date vaccination status to validate certain practical activities, such as access to hospital rotations, which encourages proactive vaccination without making it strictly mandatory).

We should also not overlook mentoring by vaccinated students (establishing a mentoring system where more advanced and vaccinated students engage with their younger peers to address their concerns and encourage vaccination by example).

Finally, the use of social media and digital platforms can also help improve attitudes (sharing testimonials, interactive quizzes, short videos, and infographics on hepatitis B and vaccination to reach students in their daily digital lives).

III.2.3. Students' Perceived Social Norms Regarding Vaccination

The study found that 52.5% of students held positive perceived social norms. This result indicates a moderate level of social influence on the intention to get vaccinated against hepatitis B. Such a finding suggests limited support from students' social circles regarding their decision to get vaccinated. This is a cause for concern among a population at risk of occupational exposure.

Several factors may explain this score. First, it could reflect the fact that teachers and healthcare professionals do not sufficiently encourage vaccination or do not set an example by getting vaccinated themselves. If supervisors, who serve as role models for students, do not demonstrate strong support or are not vaccinated themselves, their positive influence will be reduced (Sawadogo et al., 2022). Second, a score barely above average suggests that students' close social circles such as families, friends, and peers do not constitute a sufficient source of influence to reinforce their decision to get vaccinated. In an environment where the majority of students' parents or the students themselves are vaccinated and speak positively about it, one would expect a stronger social norm encouraging vaccination (Martinez et al., 2016).

Third, the media plays a key role in shaping social norms regarding vaccination. A low score for subjective norms could indicate that media coverage of the importance of hepatitis B vaccination is insufficient or unconvincing.

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It should also be noted that hepatitis B vaccination is a requirement at some institutions for admission to clinical rotations. This measure reinforces the social norm in favor of vaccination. If this requirement is absent or poorly enforced, students may not perceive clear institutional pressure, which weakens their motivation to conform to the expectations of their academic and professional environment (Sawadogo et al., 2022).

Finally, a moderate score on subjective norms may also reflect the existence of doubts or negative beliefs about vaccination within society. If certain communities express fears about vaccine side effects or downplay the risk of hepatitis B, these perceptions can influence students, even if they are in medical training. However, thanks to the efforts of civil society organizations conducting awareness campaigns and fighting against hepatitis B, we should not be at this level (Machmud et al., 2023).

The score of 52.5% indicates that medical students perceive moderate social pressure to get vaccinated against hepatitis B. This pressure is not strong enough to ensure widespread uptake of the vaccine. To improve these subjective norms, it is essential to strengthen the involvement of faculty and physicians in promoting the vaccine, increase students' exposure to compelling media campaigns, raise awareness among families and friends about the importance of vaccination, and implement stricter institutional policies making vaccination mandatory for access to clinical rotations. An integrated approach, combining academic, family, social, and media influences, would help establish a stronger social norm in favor of vaccination and increase vaccination coverage among medical students.

III.2.4. Students' Perceived Behavioral Control Regarding Vaccination

The study revealed a high level of perceived behavioral control, estimated at 56.7%. This result indicates that medical students feel they have a relatively satisfactory ability to access the hepatitis B vaccine and get vaccinated. This relatively average level suggests that medical students still perceive certain difficulties or constraints that may limit their ability to take action.

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A perceived behavioral control (PBC) of 56.7% could indicate barriers related to vaccine access, such as cost, availability in university health facilities, or administrative procedures required to get vaccinated (Machmud et al., 2023).

A moderate PCS score may also reflect students' uneven confidence in their ability to take the initiative to get vaccinated on their own. Some may perceive the process as complex or requiring administrative steps they find burdensome. Others may feel they do not have the time needed to get vaccinated due to their academic workload.

If some students encountered difficulties in getting vaccinated (vaccine shortages, high costs, perceived side effects, or fear of injections), these negative experiences may influence the group's overall perception, thereby lowering the average perceived behavioral control score.

A PBC (perceived behavioral control) of 56.7% indicates a moderately positive perception among medical students regarding their ability to get vaccinated against hepatitis B, but highlights the existence of potential barriers. To improve this perception and encourage a higher vaccination rate, it would be essential to facilitate access to the vaccine through free or subsidized university campaigns, simplify administrative procedures, integrate vaccination into the mandatory academic curriculum, and intensify awareness-raising efforts to strengthen students' confidence in their ability to take action.

III.2.5. Intention to Get Vaccinated Among Students

The proportion of students who expressed a strong intention to get vaccinated against hepatitis B was 93%. This reflects a clearly stated willingness to get vaccinated against hepatitis B. However, such an intention, however strong it may be, does not necessarily guarantee actual action. Indeed, numerous studies have highlighted a frequent gap between intention and actual behavior (Garg et al., 2023). This may be due to practical barriers (cost, vaccine accessibility, lack of time), forgetfulness, or a lack of long-term personal commitment (Machmud et al., 2023).

In a population of medical students, social desirability may influence responses, especially in the context of a survey. Students may overestimate their intention to get vaccinated because they

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know it is an expected behavior in their field of study. In reality, their commitment to getting vaccinated might be lower when no institutional pressure compels them to do so.

With a perceived behavioral control of 56.7%, students acknowledge that there are potential barriers to vaccination (cost, accessibility, administrative procedures, lack of time). This discrepancy between a strong intention and a moderate perception of their ability to get vaccinated suggests that some students may face difficulties in following through on their intention.

Since subjective norms (52.5%) are moderately favorable, this means that students do not feel very strong social pressure from those around them (teachers, family, friends, institutions) to get vaccinated (Machmud et al., 2023). However, a strong intention is more likely to translate into action when supported by high social norms and positive environmental influences.

A 93% intention rate is encouraging, but its effectiveness will depend on the ability to turn that intention into actual action. To achieve this, it is crucial to: facilitate access to the vaccine (by making it free or subsidized, or ensuring its availability on campus); strengthen perceived behavioral control; and raise subjective norms by more actively involving teachers, doctors, and peers in promoting vaccination.

III.3. Factors Associated with UJKZ Medical Students' Intention to Get Vaccinated Against Hepatitis

III.3.1. Students' Subjective Norms

The association between subjective norms and the intention to get vaccinated against hepatitis B among UJKZ medical students, with an odds ratio (OR) of 2.98 (P=0.031) for those with favorable subjective norms, highlights the importance of social pressure in the decision to get vaccinated. An OR of 2.98 means that students with favorable subjective norms are three times more likely to intend to get vaccinated compared to those with unfavorable subjective norms. It is therefore advisable, in the context of hepatitis B vaccination, to involve key influencers such as teachers, influential peers, friends, etc.

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CONCLUSION

In our study of medical students at Joseph Ki-Zerbo University, subjective norms were the only factors associated with the intention to get vaccinated against hepatitis B in 2024. The proportion of UJKZ medical students vaccinated against the hepatitis B virus was 47.79%. The proportions of students with a positive attitude (50.2%), favorable subjective norms (52.5%), perceived behavioral control (56.7%), and intention (93%) highlight the need to adopt strategies aimed at improving attitudes, subjective norms, and perceived behavioral control so that intention can be translated into action. It is also very important to involve key influencers in strategies to promote hepatitis B vaccination. Further studies examining the exact nature of the uncertainties and barriers that hinder medical students' intention to get vaccinated could be conducted to help bridge this gap. Furthermore, it will also be important to conduct studies on the development and acceptability of interventions that leverage influential figures within the student environment, given that subjective norms were the only factors associated with the intention to get vaccinated against hepatitis B in our study.

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