

## Knowledge, attitudes, and practices towards hepatitis B virus prevention among nursing students at a selected campus in Rwanda.

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### Abstract

**Introduction:** Hepatitis B virus continues to be among the significant global challenges, and its prevention is doubtful among nursing students due to the lack of knowledge or exposure to risky behaviors in their clinical practices. This study was conducted to assess nursing students at a selected campus in Rwanda about their knowledge, attitudes, and practices towards hepatitis B prevention.

**Methods:** A cross-sectional study design was used to conduct this study. Non-probability sampling, including convenience and snowball techniques, was used to determine the representation at all levels at a selected Campus from May to July 2018. Statistical Package for the Social Sciences (SPSS) version 26 was used for data entry. Descriptive and inferential statistics using Binary logistic regression were used to analyze the data. Institutional Review Board (IRB) of the University of Rwanda approved the study, and participants' rights were protected.

**Results:** Among 171 study participants, only 140 returned the completed questionnaires, which translates to a response rate of 82.4%. Among the students who participated in this study, most were males, 75 (53.5%). The respondents' mean age was 25 years old, and the maximum age was 43. Most of the participants were from level 1 52(37.1%). The findings revealed that nursing students have adequate knowledge and practices towards HBV prevention at 65% and 71%, respectively. However, their attitudes regarding HBV prevention were negative because 96% scored at most four questions right.

**Conclusion:** Knowledge and practices regarding HBV prevention among nursing students were quite adequate. However, a significant proportion of nursing students do not have good attitudes. These findings highlight the need to increase knowledge about HBV among nursing students in clinical orientation meetings before starting their clinical placements and introducing infection prevention and control training when they are already in clinical settings.

**Keywords:** Hepatitis B virus, knowledge, attitudes, practices, nursing students, Rwanda

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## Connaissances, attitudes et pratiques vis-à-vis de la prévention du virus de l'hépatite B chez les étudiants en sciences infirmières d'un campus sélectionné au Rwanda

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### Résumé

**Introduction :** Le virus de l'hépatite B continue de figurer parmi les défis mondiaux importants et sa prévention est douteuse chez les étudiants en sciences infirmières en raison du manque de connaissances ou de l'exposition à des comportements à risque dans leurs pratiques cliniques. Cette évaluation a été menée pour évaluer les étudiants en sciences infirmières d'un campus sélectionné au Rwanda sur leurs connaissances, attitudes et pratiques en matière de prévention de l'hépatite B.

**Méthode de l'étude :** Un plan d'étude transversale a été utilisé pour mener cette étude. L'échantillonnage non probabiliste, y compris les techniques de commodité et de boule de neige, a été utilisé pour déterminer la représentation à tous les niveaux dans un campus sélectionné de May à Juillet 2018. Le progiciel statistique pour les sciences sociales (PSSS) version 26 a été utilisé pour la saisie des données. Des statistiques descriptives et inférentielles utilisant la régression logistique binaire ont été utilisées pour analyser les données. Le Comité d'examen institutionnel (CEI) de l'Université du Rwanda a approuvé l'étude et les droits des participants ont été protégés.

**Résultat de l'étude :** Parmi 171 participants à l'étude, seulement 140 ont renvoyé les questionnaires remplis, ce qui se traduit par un taux de réponse de 82,4%. Parmi les étudiants qui ont participé à cette étude, la plupart était des hommes, 75 (53,5%). L'âge moyen des répondants était de 25 ans et l'âge maximum était de 43 ans. La plupart des participants était du niveau 1 52 (37,1%). Les résultats ont révélé que les étudiants en sciences infirmières ont des connaissances et une pratique adéquates en matière de prévention du VHB à 65% et 71%, respectivement. Cependant, leur attitude vis-à-vis de la prévention du VHB était négative, car 96% ont répondu à quatre questions correctes.

**Conclusion :** Les connaissances et les pratiques concernant la prévention du VHB chez les étudiants en sciences infirmières étaient tout à fait adéquates. Cependant, une proportion importante d'étudiants en sciences infirmières n'a pas de bonnes attitudes. Ces résultats mettent en évidence la nécessité d'améliorer les connaissances sur le VHB chez les étudiants en soins infirmiers lors de réunions d'orientation clinique avant de commencer leurs stages cliniques et d'introduire une formation sur la prévention et le contrôle des infections lorsqu'ils sont déjà en milieu clinique.

**Mots-clés:** virus de l'hépatite B, connaissances, attitudes, pratiques, étudiants en sciences infirmières, Rwanda

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## INTRODUCTION

Hepatitis B virus is one of the significant global challenges, and about 257 million people live with hepatitis B virus (HBV) infection, whereby a significant number of 887000 died in 2015 from its complications (1). Many studies have found that HBV prevention is doubtful among nursing students due to the lack of knowledge or exposure to risky behaviors in their clinical practices. For instance, in Asia, one study found that nursing students had good knowledge of HBV but still had risky behaviors during their practices (2). Contrary, another study on the same continent has found that undergraduate students had poor knowledge (3).

In Africa, there is a lack of awareness about Hepatitis B, its transmission route, and modes of prevention among students entering into the profession (4). This is a challenge because these students are highly exposed to accidental blood and low uptake of HBV vaccine (5). Early exposure of these students to clinical services is also one factor that increases their risk of acquiring and transmitting infections, including HBV (6). These results are very similar to the studies done in Sub-Saharan Africa among students (7).

In Rwanda, viral hepatitis is considered a severe public health concern, its prevalence is not well known, and the mortality related to these infections is poorly characterized. However, some current estimates compiled from various studies provided a Hepatitis B prevalence among different groups. HBV infection is 4.3% among people living with HIV (8) and 4.1% among blood donors in the whole country, with a big number in the Central and Eastern regions (9). Besides, 3.1% of pregnant women in Kigali were seropositive for HBsAg (10). Considering the magnitude mentioned above of HBV prevalence in Rwanda, assessing nursing students about HBV prevention would be a top priority since they get in contact with those clients. During the clinical training, students are exposed to body fluids, which makes them be at high risk of contracting HBV once their knowledge, attitudes, and practices are not addressed (5). Therefore, students should be well educated on preventing HBV and taking the vaccine (2,7). Although there are measures taken across the literature, there is limited knowledge of how nursing students in Rwanda prevent HBV in the clinical settings. Therefore, the researchers sought to assess the knowledge, attitude, and practice towards preventing hepatitis B virus among nursing students at a selected campus.

## MATERIALS AND METHODS

### Research design

The study employed a cross-sectional study design.

### Research setting

This research was conducted at a selected campus, which trains nurses in Rwanda.

### Population

Nursing students who were available at the time of the study and with a will to participate.

### Sample size and sampling strategy

Given that this study's total population was known, the formula by Yamane was used to calculate the sample size to represent all 297 nursing students at all levels accurately.

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the sample size, N is the total population, and e is the precision level (0.05).

$$\text{Therefore, } n = \frac{297}{1 + 297(0.05)^2} = 170.4$$

Since nursing students were in clinical practice, non-probability sampling, including convenience and snowball techniques, was used to determine the representation at all levels. Therefore, 171 students were sampled to participate in this study.

### Data Collection instrument and process

An adapted research tool for the study conducted in Ghana was used, and the permission was granted (12). The pilot study was done among the students who were not part of the study for validity and reliability. This tool is comprised of three sections. The first section assessed the socio-demographic information (age, gender, and level of study). The second section covered questions regarding students' knowledge of HBV. The third section covers questions on attitudes and practices. Researchers met participants, explained the data questionnaire and objectives of the study before data collection. The researchers screened and counted the questionnaires as well as discarded the incomplete ones.

### Data analysis

SPSS, version 26 was used for data entry and analysis. Descriptive and inferential statistics were used. Data were presented in tables. Knowledge scores were calculated from the computed knowledge items, which are used to categorize knowledge levels. The score from 18 to 20 was categorized as a low level of knowledge while the scores from 21 to 27 were categorized

as a high level of knowledge, which constitutes 70% of all correct answers to the knowledge items. The lower the score, the lower level of knowledge; the higher the score, the higher the knowledge. For practice questions, the score from 5 to 6 was categorized as a low level of practice, while the scores from 7 to 10 were categorized as a high level of practice, which constitutes 70% of all correct answers to the practice items. For the attitude section, a positive attitude when the students answered five correct questions and above, while a negative attitude was defined as answering at most four correct questions.

### Ethical considerations

The permission to carry out the proposed research was sought and granted from the selected study setting after being reviewed and approved by the University of Rwanda, College of Medicine and Health Sciences Institutional Review Board (UR-CMHS-IRB). The rights of the participants were protected.

## RESULTS

### Socio-demographic characteristics of the study participants

Among 171 study participants whom we selected as a sample, only 140 consented and returned the completed questionnaires, which translates to a response rate of 82.4%. The results highlight that both genders were represented highly in this research with a high representation of males 75 (53.5%). The respondents' mean age was 25 years old, and the maximum age was 43. Most nursing students who participated in the research were from level 1 (37%).

### Knowledge of nursing students towards HBV prevention

The results revealed that most nursing students have good knowledge of the hepatitis types, where the majority, 85(61%), know that five types do exist. A significant percentage of 27(19%) have reported the most common type to be three.

**The results from (table 1) indicate that more than half 122(87%) know that hepatitis B can be transmitted by needle stick injury.** The highest percentage of participants 134(96%) know that hepatitis B can be transmitted by unprotected sexual intercourse from the table above.

### Hepatitis B diagnosis, transmission, and treatment

The majority in this study, 111(79%),

mentioned that hepatitis B is not curable and 81(58%) mentioned that a vaccinated person could not infect others. The study participants in **(table 2)** indicated that hepatitis B is mainly diagnosed utilizing laboratory investigation where 126(90%) have reported that. Whether hepatitis B can be prevented or not, the study results clearly show that the participants know that it can (95%). Counseling was shown to be the least trusted way of preventive measure against hepatitis B, among others, where only 61% believe that this measure can be. Other preventive measures were reported at a very high level.

This study revealed that the overall level of knowledge of nursing students towards HBV prevention is quite good as the majority, 91(65%), scored more than a half of knowledge items.

### Attitudes of nursing students towards HBV prevention

The results indicate that 99% of the participants know that hepatitis B a severe public health concern. 21% of the participants said that the HBV vaccine is not safe. The results also highlight that most of the study participants have a negative attitude towards HBV, as indicated by the majority of 135(96%).

**Table 3** revealed that 41 (29.5%) of the participants have had a stick injury; however, only 29 (70.79%) have been tested. The results in this study revealed that the overall level of practices of nursing students towards HBV prevention was high as the majority of the study participants 100(71%) scored positively on practice items.

The results in **(table 4)** indicate that the participants believe that Hepatitis B vaccination should be compulsory at 61.2% and are always scared of the vaccine, but they trust it at a very high level.

## DISCUSSION

### Knowledge of nursing students towards HBV prevention

The current findings revealed that most of the participants, 126(90%), is mainly diagnosed using laboratory investigation. Besides, most of the participants, 122(87%), know that hepatitis B can be transmitted by needle stick injury, and almost 134(96%) know that hepatitis B can be transmitted by sex. These results are similar to the study done in Saudi Arabia. Almost of the participants 136(97%) in this study do have good knowledge of organ affected in a case of hepatitis B whereby they mentioned the liver. Similarly to the findings of

one study done in Iran.

The present study results revealed that the majority of the participants, 111(79%), mentioned that hepatitis B is not curable while more than a half, 81(58%), mentioned that a vaccinated person could not infect at a high degree, which is similar to the findings from another study. The results indicate that the overall level of knowledge of nursing students towards HBV prevention is quite good as the majority, 91(65%), scored more than half of the knowledge items. In contrast to Dhaka Medical College and Iraqi studies but similar to the study done on Nepal nursing students. The excellent knowledge score noted may be due to different information sources on HBV as it is a public health issue nowadays.

#### **Attitudes of nursing students towards HBV prevention**

The present study results indicated that 99% of the participants know that hepatitis B is a serious public health concern. However, the overall score of attitude revealed that most of the study participants have a negative attitude towards HBV, as indicated by most participants who scored above 70% of total attitude scores were very low in number 5(4%). This contrasts with the study done in Odisha Medical College, which showed a positive attitude towards HBV prevention. It is again in contrast with the study done on Saudi Arabia University students. In this study, the participants demonstrated a right attitude towards all the preventive ways of Hepatitis B. Participants' negative attitude may be justified by their busy curriculum where they concentrate on given lessons and lack self-teaching time.

#### **Practices of nursing students towards HBV prevention.**

The results also revealed that some students, 41(29.5%), have had a stick injury, and only 70.7% of them have tested for HBV. The results are similar to the studies done in Saudi Arabia and India. A significant number of the participants, 121(91%), have been vaccinated from the HBV vaccine, but most of them, 108(80%), did not check immunity. These are in contrast with the study done in one medical college. Participants' high vaccination rate can be attributed to the UR initiative of giving HBV to every student entering the College of Medicine and Health Sciences.

The results indicate that student nurses' overall level of practices towards HBV prevention is high as almost two-third of the

participants 100(71%) scored positively on practice items. This is in contrast to the findings in a study that found that nursing students have bad practices towards HBV prevention.

This study has strengthened that of the authors' best of knowledge, it is the first study that investigated the knowledge, attitudes and practices towards HBV prevention among nursing students in Rwanda. Since convenience sampling was used, this could lead to selection bias; however, the snowball technique was also used to assure the representability at all study levels. We also acknowledge several limitations. First of all, this study was conducted at one selected campus; therefore, the results could not be generalized to other campuses and the general public. Secondly, some study participants did not return and complete all the questionnaires, which lowered the response rate and bias. Thirdly, this study considered only descriptive statistics. Future researches should use different study settings and methodological approaches to investigate the association between different variables. Comparison of students from different departments would also be an added contribution to the body of knowledge.

#### **CONCLUSIONS**

This study was to assess the knowledge, attitudes, and practices towards HBV prevention among nursing students at a selected campus. The findings have highlighted that knowledge and practices regarding HBV prevention among nursing students were quite good. However, a significant proportion of nursing students showed negative attitudes. Thus, there is a need to increase knowledge about HBV among nursing students in clinical orientation meetings before starting their clinical placements and introducing regular infection prevention and control training when they are already in clinical settings.

**Data availability:** Data are available to the corresponding author upon request.

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**Conflicts of interest:** The authors declare that there is no conflict of interest.

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**Table 1. Knowledge on the Hepatitis B transmission**

Knowledge of Hepatitis B transmission		N	%
Hepatitis B can be transmitted by needle stick injury	Yes	122	87%
	No	7	5%
	Don't Know	11	8%
Hepatitis B can be transmitted by Vertical Transmission	Yes	95	68%
	No	11	8%
	Don't Know	34	24%
Hepatitis B can be transmitted by Infected Blood Transfusion	Yes	134	96%
	No	1	1%
	Don't Know	5	4%
Hepatitis B can be transmitted by unsterilized Instruments	Yes	108	77%
	No	16	11%
	Don't Know	16	11%
Hepatitis B can be transmitted by Sex	Yes	123	88%
	No	6	4%
	Don't Know	11	8%
Knowledge on Hepatitis B transmission by faeco-Oral route	Yes	48	35%
	No	54	39%
	Don't Know	36	26%

**Table 2. Hepatitis B prevention**

Variables		N	%
Is Hepatitis B preventable?	Yes	134	96%
	No	6	4%
	Don't Know	0	0%
Counseling as a preventive measure against Hepatitis B	Yes	85	61%
	No	48	34%
	Don't Know	7	5%
Vaccination of at-risk individuals a preventive measure against hepatitis	Yes	134	96%
	No	5	4%
	Don't Know	1	1%
Use of sterilized instruments as a preventive measure against hepatitis	Yes	129	92%
	No	7	5%
	Don't Know	4	3%
Practicing Safe Sex as a preventive measure against hepatitis	Yes	134	96%
	No	3	2%
	Don't Know	3	2%
Hand washing as a preventive measure against hepatitis	Yes	102	73%
	No	25	18%
	Don't Know	13	9%

**Table 3. The practice of nursing students towards HBV prevention**

Variables		N	%
Have you ever had a needle stick injury?	Yes	41	29.5%
	No	98	70.5%
Were you tested after the needle stick injury?	Yes	29	70.7%
	No	12	29.2%
Days after which tested	4	10	27.0%
	7	7	18.9%
	42	5	13.5%
	180	13	35.1%
	Over 180	2	5.4%
	Other	0	0.0%
Have you taken the HBV Vaccine?	Yes	121	91.0%
	No	12	9.0%
If yes, was immunity to Hepatitis B checked after vaccination?	Yes	13	10.7%
	No	108	89.2%
I can change gloves for each patient during blood taking	Yes	131	94.2%
	No	7	5.0%
	3	1	.7%

**Table 4. Respondents' personal views HBV prevention.**

Variables		N	%
Hepatitis B vaccination should be compulsory	Strongly agree	85	61.2%
	Agree	43	30.9%
	Disagree	7	5.0%
	Strongly disagree	2	1.4%
	Don't Know	2	1.4%
I am scared of vaccination	Strongly agree	20	14.4%
	Agree	28	20.1%
	Disagree	32	23.0%
	Strongly disagree	54	38.8%
	Don't Know	5	3.6%
I am always careful, so I don't need it	Strongly agree	13	9.4%
	Agree	11	7.9%
	Disagree	44	31.7%
	Strongly disagree	64	46.0%
	Don't Know	7	5.0%
Not at risk, therefore don't need it	Strongly agree	9	6.5%
	Agree	10	7.2%
	Disagree	38	27.3%
	Strongly disagree	75	54.0%
	Don't Know	7	5.0%
Don't trust the vaccine	Strongly agree	13	9.4%
	Agree	11	7.9%
	Disagree	38	27.3%
	Strongly disagree	73	52.5%
	Don't Know	4	2.9%