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Nexus International University ISSN: *3007-1844;* 10(1): 25-32

Investigating Prevalence of Risk Factors of Hepatitis 'B' Among Staff and Students of Public Tertiary Institutions in Nigeria: Implication for Health Security in Education.

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Abstract. Just as academic staff of any tertiary institution are employed to enhance learning through instructions and other services that promotes institutional mission, so also, students are admitted in school to acquire knowledge, and to be given the best possible chances of achieving good and quality education but not to return home with a transmissible disease like Hepatitis 'B' Virus (HBV). The purpose of this study was to investigate the prevalence of risk factors of HBV among academic staff and students of tertiary institutions along gender lines, as implication for health security to education. A cross-sectional descriptive study was carried out in three selected public tertiary institutions within Niger State. The study adopted 90 academic staff (51 males and 39 females), and 348 students (156 males and 192 females) selected randomly from the three institutions. A self-developed questionnaire titled Questionnaire for Assessment of Prevalence of Risk-Factors of Hepatitis B Virus (SQ-APRF-HBV) for both academic staff and students was used to collect data. Data collected were analyzed using mean, standard deviations, and t-test at 0.05 level of significant difference. The findings of the study revealed that there is statistical significant difference between the male and female academic staff in sexual health and behavior and in blood transfusion related activities. This is evident as results showed 17.00 for sexual health and behavior, and 3.86 in blood transfusion related activities, which are greater than the critical value of 1.990. For sexual health and behavior, sharing of supposed personal items, use of unsterilized items, and blood transfusion related activities among tertiary students showed -3.59, -19.62, -32.62 and 0.89 respectively, all less than the critical value of 1.960. Mandatory HBV test for staff and students, among others were recommended.

Keywords: Hepatitis 'B', Risk Factors, Academic Staff, Students, Tertiary Institutions, Health Security and Transmission

1. Introduction

Hepatitis B is the medical terminology for inflammation of the liver. Its complications are associated with infections such as liver cirrhosis and cancer (Ajuwon, Yujuico, Roper, Richardson, Sheel and Libury, 2021). Hepatitis B is a serious infectious disease caused by a virus that attacks human liver and affects people of all ages around the world. It causes swelling and reddening of liver leading to its damage, and causing serious illness and in some cases, death (Chanda and Mutala, 2021). Ajuwon et'al (2021) further revealed that, "Hepatitis B Virus (HBV) was responsible for an estimated 820,000 deaths in 2019". There are many causes of hepatitis B, including viruses, alcoholism, and medications. However, virus-related infections are the common causes of chronic hepatitis in Africa (Namwinga, 2021).

It is fearful to know that Hepatitis B Virus (HBV) can easily be spread among people, most especially if proper hygiene is not strictly observed and caution to anti-social behavior is not carefully treaded (Chanda and Mutala, 2021). Fasoranti (2021 opined that the main routes of transmission are through sexual contact, sharing of needles, tattooing and body piercing as transmission occurs through blood or other bodily fluids, including semen or vaginal fluids. Douglas and Lukman (2021) stated;" anyone can get hepatitis B, and people at higher risk of becoming infected with the virus are those that have not received hepatitis B vaccine".

Most fearful is the fact that, "most people do not show symptoms when they are newly infected or chronically infected, they can unknowingly spread the virus to others and continue the silent spread of hepatitis B" (Mkandawire, 2022). Risk factor of hepatitis B, therefore, is anything that increases a person's chances of contacting the virus, or developing the disease (Douglas and Lukman, 2021). The more risks any persons are exposed to, the higher the chances of being infected with the disease (Namwinga, 2023). Douglas and Lukman further stated that, "certain lifestyle-factors are linked to HBV infection, hence, avoiding or changing certain behaviors can lower their risk.

In Nigeria, many youths between the ages of 15 to 50 are in various tertiary institutions, either as staff (Academic and non-academic staff) or student. Hence, the collection of these institutions of higher learning translates to higher tendencies of youthful socializations and prevalence of anti-social behaviors capable enough to facilitate rapid spread of the hepatitis B virus. Due to the way that Hepatitis B spreads, people most at risk for getting infected include people who have unprotected sex, people who live in close contact with a person with hepatitis B, people who share personal items such as unsterile needles, razor blades, tooth-brushes, nail clippers, body jewelries, etc. (Hepatitis B Foundation, 2020). Hence, social interactions and some anti-social behavior exhibited among staff and students in tertiary institutions posed as risk factors which exposes them to more likely to be infected, or increases chances of influencing the development of the disease.

According to Namwinga (2023) and Fasoranti (2021), the prevalence of some of the risk factors shielded in many and varied observed anti-social behaviors, like the practice of illicit sexual intercourse commonized among male and female adolescents and adults, drug, substance and alcohol abuse, cultism and fighting, among others are very common, especially, in tertiary institutions of learning, in Nigeria. Similar studies by some authors have come up with some findings; example, Shehu and Ibrahim (2021) reported more female subjects are infected with HBV than their male counterparts, though with no explicit reasons, Namwinga (2023), in a conversed report, opined "the higher male prevalence is likely because adolescent and adult males are prone to engage in risky practices that promote the spread and transmission of the virus.

1.1 Statement of the Problem

The youths in Nigeria accounts for 32% of its 227 million people and more than half of adolescents and adult within the age range of 15 - 40 are sexually active (Isife, 2016), and a common characteristic of young people in Nigeria is their potential vulnerability to sexually transmitted infections including Hepatitis B Virus (HBV). Aside the poor hygiene practices which may likely promote the spread of the virus, prevalence of anti-social behavior, wild practices of dating behavior and violence, sexual harassments and misconducts have been reported among staff and students alike. These vices kept increasing dramatically in the corridors of Nigeria tertiary institutions over the past years. These have health endangering implications as such vices are capable enough to facilitate the spread of HBV. Several studies have addressed issues around prevalence of risk factors of hepatitis B among male and female gender, but no serious attention has been paid to Nigerian Universities and implication for health security in education, especially in Niger State. This investigation is an attempt to fill this knowledge gap.

1.2 Objectives of the Study

- To assess the risk factors of hepatitis 'B' virus among male and female academic staff of tertiary institutions in Niger State.
- To investigate the risk factors of hepatitis B virus among male and female students of tertiary institutions in Niger State.

1.3 Research Questions

- What is the difference in the risk factors of hepatitis B virus between male and female academic staff of tertiary institutions in Niger State?
- What is the difference in the risk factors of hepatitis 'B' virus between male and female students of tertiary institutions in Niger State?

1.4 Hypothesis

- There is no statistical significant difference in the risk factors of hepatitis 'B' virus between male and female academic staff in tertiary institutions in Niger State.
- There is no statistical significant difference in the risk factors of hepatitis 'B' virus between male and

female students in tertiary institutions in Niger State.

1.5 Theoretical Framework

This study employed the Theory of Reasoned Action (TRA) advanced by Martins Fishbein and Icek Ajzen in 1975.
The theory is established on the assumption that individuals' behavior is determined by an intent to launch a particular action which is not devoid of the persons' attitude towards his/her behavior and subjective norms (Nickerson, 2023). Hence, the theory has four main terms: Belief, Attitude, Subjective Norms, and Intention (Hagger, 2019). This suggests that Attitude, Norms and perceived control each lead to intentions - the readiness to exhibit certain behavior (Looti, 2022). However, other scientists have attempted to re-group and explain the background factors that lead to the behavioral, normative, and control beliefs linking to the attitude, subjective norms, and perceived behavioral control, respectively. These environmental factors, according to Nickerson (2023) include Personal Factors (traits, locus control, emotions, and health concerns), Demographic factors (Age, gender, race, ethnicity, education, income, and religion), and Environmental factors (Diagnosis, stress, and media exposure).

By implication to this study, intention among staff and students to indulge into any social and unhealthy practices can be explained partly by their knowledge about the attitude towards the activity. The two fundamental assumptions derived from the theory are that human beings are rational and make systematic use of the information available to them. Secondly, people consider the possible implications of their intended actions before deciding whether to indulge or not in certain behavior. For example, in situations where staff and students are furnished with adequate information about the relationship between some social interactions and anti-social behaviors, such as illicit and unprotected sex common among students and with staff in tertiary institutions and the consequent risk factor of spreading hepatitis 'B' virus, the intention to get involved into such health-threatened activity may be threaded with great caution. If a student knows that the society is at the risk of being infected by the carriers who may not be aware of their health status as it relates to the prevalence of the virus, then, the person is more likely to channel his social interactions and behaviors into activity that will protect him/her from the associated risk of being infected with the virus.

2. Conceptual Issues

2.1 Common Symptoms of Hepatitis B Infection

Generally, the common signs and symptoms of hepatitis B, according to Mendy and Hall (2024) may include; abdominal pains, dark urine, fever, joint pain, loss of appetite, nausea and vomiting, weakness and fatigue, loose stool or diarrhea, yellowing of the skin and jaundice may appear. "In jaundice, the skin and the whites of the eyes take on a yellow tint.

It is important to note that "more than 90% of people who get HBV as adults ultimately recover from the symptoms.
When managed properly, those living with the virus can expect to live a normal life (Mendy and Hall, 2024).

2.2 Risk Factors of Hepatitis B Virus Among Staff and Students of Tertiary Institutions

The risk factors which are common causes and transmittable charnels of spreading the virus to other people can be diverse and contextual. These are as follows:

Sexual Contact:

Hepatitis 'B' Virus (HBV) infection could result from transmission of associated organisms through any genital, anal or oral contact with another person's which may occur during the process of sexual contact (Inoue and Tanaka, 2016). Mojeed (2021), in his article published in Premium Times Newspaper, reported that "some Nigerian university lecturers, especially those in public universities have some time now gained an unsavory reputation as sex predators. Just as Sunday (2023) noted the explosive tendencies of male lecturers taking sexual advantage of young naïve female students in exchange for marks. Hence, those with multiple sexual partners are at higher risk of being infected, especially when having unprotected sexual intercourse with an infected partner (Mendy and Hall, 2024). The virus can spread through body fluids like semen or blood from an infected person to an un-infected person during unprotected sexual process.

Indiscriminate Sharing of Personal Items:

HBV can be transmitted carelessly and unintentionally by sharing of personal items such as razor blades, nail cutter, barbing

clippers, body jewelries, toothbrush, towel handkerchiefs, earrings, earphones etc. (Ilo, Onwunaka, and Nwimo, 2015). It takes only a small amounts and exposure of blood on the items to transmit the virus (Hepatitis B Foundation, 2020).

Use of Unsterilized Items:

The transmission of HBV is also possible by contaminated needles and sharp objects (Inoue and Tanaka, 2016). Egbe, Ike and Egbe (2023) observed, "body piercing, which represents a progressively popular socio-cultural phenomenon, is also a potential exposure approach for the HBV". Tattooing and latest trends in fashions, such as body piercing and explosives make-ups through the use of sharp objects, especially, when the sterility of the objects used are not guaranteed pose high risks of contracting and spreading the virus (Fasoranti, 2021).

Blood Transfusion:

Despite the incidence of a drastic fall in transfusion-associated hepatitis due to improved donor selection, screening criteria and major technological advances in testing for viral hepatitis carriers, tests will never be 100% reliable, and the risk will never be zero (Douglas and Lukman, 2021). Namwinga, advised, however, "it may still be reasonable to consider transfusion of blood as a possible cause and risk factor of HBV".

3. Research Methodology

A cross-sectional study was carried out among 90 and 348 randomly selected academic teaching staff and students respectively, in three selected public tertiary institutions within Niger State. Namely, Niger State College of Education, Minna (C.O.E), Ibrahim Badamasi Babangida University, Lapai (IBBUL), and Federal Polyitechnic Bida (FPB). A self-developed questionnaires titled Questionnaire for Assessment of Prevalence of Risk-Factors of Hepatitis B Virus (SQ-APRF-HBV-AS) was used to collect data on the prevalence of risk-factors of HBV among staff and students of the tertiary institutions. The data was analyzed using descriptive statistics of mean and standard deviation, and inferential statistics of t-test was used to test the hypothesis at the 0.05 level of significance.

There were 90 and 350 questionnaires that were distributed for academic staff and students, respectively, 2 were not returned by the students, leaving 90 from academic staff and 348 from students' valid questionnaires for analysis. The distribution of the sampled population by gender and HBV status are presented in Table 1 below:

Table 1: Distribution of the Sample by Gender and HBV Status

Variables	Count	Males	Females	HBV Status		
				Positive	Negative	Uncertain
Academic Staff	90	51	39	-	82	8
Students	348	156	192	2	254	94

Table 1 above showed that, 51 (56.6%) and 156 (44.8%) of the respondents were male while 39 (43.33%) and 192 (55.2%) were female, for academic staff and students, respectively. A high proportion of the academic staff respondents, 82 (91%) and students' respondents 254 (72.9%) indicated negative on their HBV status, while, 8 (9%) of academic staff and 94 (27%) were uncertain, as 2 (0.6%) of students' respondents indicated positive.

4. Results

Answering Research Questions

The results of this study is presented in tables 2 to 5 below:

Table 2: Descriptive Statistics of Sexual Health and Behavior among Male and Female Academic Staff and Students in Tertiary Institutions in Niger State.

		Academic Staff				Students			
S/N	Statement	Mean		SD		Mean		SD	
		M	F	M	F	M	F	M	F
1.	I have more than one sex partner	3.10	1.23	0.35	0.54	2.70	2.67	0.18	0.16
2.	I use condom & other protective items during sex	2.61	1.90	0.31	0.41	1.94	2.17	0.20	0.17
3.	I don't have any sex partner	2.00	1.33	0.34	0.52	1.82	1.86	0.21	0.18
	Aggregate	2.57	1.47	0.33	0.49	2.15	2.23	0.20	0.17

Means and standard deviations of responses of academic staff from the outlines of items related to sexual health and behavior as presented in table 2 showed male academic staff are involved more into sexual relationships, hence, they are more at risk of being infected with HBV than their female counterparts. This is proved from the coefficients of total mean responses and standard deviation of 2.57 ± 0.33 for males to 1.47 ± 0.49 of females. The mean and standard deviation of 2.15 ± 0.20 for male students and 2.23 ± 0.17 for female students showed a correlated sexual health and behaviors, suggesting equal risk-factor prevalence.

Table 3: Descriptive Statistics of Sharing of Supposed Personal Items among Male and Female Academic Staff and Students in Tertiary Institution in Niger State.

		Academic Staff				Students			
S/N	Statement	Mean		SD		Mean		SD	
		M	F	M	F	M	F	M	F
4.	I use public barbing clipper/saloon items for my hair up-keep	2.78	3.08	0.32	0.40	3.19	3.73	0.21	0.24
5.	I use personal nail cutter/razor blade to cut nails	3.53	3.79	0.43	0.16	3.49	3.98	0.24	0.27
	Aggregate	3.16	3.44	0.38	0.28	3.34	3.86	0.23	0.26

Table 3 showed the total mean responses and standard deviations of 3.16 ± 0.38 and 3.44 ± 0.28 for male and female academic staff respectively, and 3.34 ± 0.23 for male students and 3.86 ± 0.26 for female students, indicating a slight difference in the risk factor of HBV between male and female academic staff and students, respectively. However, a succinct description is pointed more towards both females having a careless attitude of sharing supposed personal items than their male counterparts.

Table 4: Descriptive Statistics of Use of Unsterilized Items among Male and Female Academic Staff and Students in Tertiary Institutions in Niger State.

		Academic Staff				Students			
S/N	Statement	Mean		SD		Mean		SD	
		M	F	M	F	M	F	M	F
6.	I have tattoos on my body	1.00	1.00	0.52	0.60	1.17	1.66	0.28	0.20
7.	I have a modern pierced nose, multiple pierced ear/other parts of my body.	1.00	1.34	0.52	0.60	1.17	2.20	0.28	0.17
8.	I have ever been pierced with unsterlised needle/items for other reasons.	1.45	1.49	0.43	0.48	1.90	1.74	0.22	0.20
	Aggregate	1.15	1.28	0.49	0.51	1.41	1.87	0.25	0.19

In table 4 above, there is similar prevalence of risk factors of HBV between male and female academic staff and students, respectively, as shown by the coefficients of mean responses and resultant standard deviations (1.15 ± 0.49 and 1.28 ± 0.51).

Table 5: Descriptive Statistics of Blood Transfusion Related Activities among Male and Female Academic Staff and Students in Tertiary Institutions in Niger State.

		Academic Staff				Students			
S/N	Statement	Mean		SD		Mean		SD	
		M	F	M	F	M	F	M	F
9.	I have blood transfusion history.	1.12	1.00	0.50	0.60	1.44	1.90	0.08	0.18
10.	I am a blood donor	1.76	1.00	0.38	0.60	1.49	1.00	0.24	0.27
	Aggregate	1.44	1.00	0.44	0.60	1.47	1.45	0.16	0.23

The mean responses of male and female academic staff and students to the outlined items related to blood transfusion shows male academic staff possess higher risk than their female folks (1.44 ± 0.44 and 1.00 ± 0.60), as female academic staff shows non-prevalence. Whereas, there is similar mean responses and standard deviations from male and female students (1.47 ± 0.16 and 1.45 ± 0.23), suggesting equal prevalence of risk factors between and among them.

Testing of Hypothesis

Tables 6, 7, 8 and 9 shows t-test statistics for difference in the prevalence of risk factors of HBV between male and female academic staff, and male and female students.

Table 6: t-test Statistics for Difference in Sexual Health and Behavior among Male and Female Academic Staff and Students in Tertiary Institutions in Niger State.

	Academic Staff				Students			
	SD	DF	t_{cal}	t_{tab}	SD	DF	t_{cal}	t_{tab}
Male	0.33				0.20			
Female	0.49	88	17.00	1.990	0.17	346	-3.59	1.968

α = 0.05; df = n-2

The t-test statistics at 0.05 significant level with a p-value of 17.00 showed there is statistical significant difference between the male and female academic staff' sexual health and behaviors. This is because the calculated value is greater than the critical value of 1.990. On the other hand, the t-test statistics with a p-value of -3.59, which is less than the critical value of 1.968, showed a contrary result, that, there is no statistically significant difference between male and female students' sexual health and behaviors. Since, the calculated values for academic staff is greater, and that of the students is less than the critical values, the null hypothesis for $H0_1$ and $H0_2$ is rejected and upheld, respectively.

Table 7: t-test Statistics for Difference in Sharing of Supposed Personal Items among Male and Female Academic Staff and Students in Tertiary Institutions in Niger State.

	Academic Staff				Students			
	SD	DF	t_{cal}	t_{tab}	SD	DF	t_{cal}	t_{tab}
Male	0.38				0.23			
Female	0.28	88	-4.06	1.990	0.26	346	-19.62	1.968

α = 0.05; df = n-2

The t-test statistics at 0.05 significant level with a p-value of -4.06 and -19.62 revealed there is no statistically significant difference between the male and female academic staff, and male and female students in sharing of supposed personal items, respectively. The calculated values for both are less than the critical values of 1.990 and 1.968, respectively. The null hypotheses for both $H0_1$ and $H0_2$ are not rejected.

Table 8: t-test Statistics for Difference in the use of Sterilized Items among Male and Female Academic Staff and Students in Tertiary Institutions in Niger State.

	Academic Staff				Students			
	SD	DF	t_{cal}	t_{tab}	SD	DF	t_{cal}	t_{tab}
Male	0.49				0.25			
Female	0.51	88	-1.21	1.990	0.19	346	-32.62	1.968

α = 0.05; df = n-2

From t-test statistics at 0.05 significant level and with a p-value of -1.21 and -32.62 showed there is no statistically significant difference between the male and female academic staff, and male and female students in the use of sterilized items, respectively. The calculated values for both are less than the critical values of 1.990 and 1.968, respectively. The null hypotheses for both $H0_1$ and $H0_2$ are upheld.

Table 9: t-test Statistics for Difference in Blood Transfusion Related Activities among Male and Female Academic Staff and Students in Tertiary Institutions in Niger State.

	Academic Staff				Students			
	SD	DF	t_{cal}	t_{tab}	SD	DF	t_{cal}	t_{tab}
Male	0.44				0.16			
Female	0.60	88	3.86	1.990	0.23	346	0.89	1.968

α = 0.05; df = n-2

From the table 9 above, the t-test statistics at 0.05 significant level with a p-value of 3.86 showed there is statistical significant difference between the male and female academic staff in blood transfusion related activities, because the calculated value is greater than the critical value of 1.990. On the other hand, the t-test statistics with a p-value of 0.89, which is less than the critical value of 1.968, showed a contrary result, that, there is no statistically significant difference between male and female students in blood transfusion related activities. Since, the calculated values for academic staff is greater, and that of the students is less than the critical values, the null hypothesis for $H0_1$ and $H0_2$ is rejected and upheld, respectively.

5. Discussion on the findings

The purpose of this study was to investigate the risk factors of HBV among academic staff and students of tertiary institutions in Nigeria with focus on the difference in the prevalence of risk factors of hepatitis 'B' virus between male and female genders, respectively. The results of the findings showed that there is statistical difference in the prevalence of risk factors between the male and female academic staff in tertiary institutions, with Male counterpart more frequently exposed to the risk factors of hepatitis B virus, specifically, through sexual health and behaviors, as well as blood transfusion related activities. This result is in agreement with the findings of Chanda and Mutala (2021), which concluded that Male were more frequently exposed to the risk factors of hepatitis B virus as compared to female folks.

The findings of this study further revealed, there is no significant difference in the risk factors of HBV between the male and female students in tertiary institutions. The result agreed with Abimbola, Odinaka and Nicholas (2016) who observed that, male and female subjects were equally exposed to HBV, and Namwinga (2023) equally agrees that male and females are equally exposed to the risk factors. However, Shehu and Ibrahim (2021) reported that more females than males were seropositive to HBV laboratory test, suggesting, females are exposed more to the risk factors. This is in conflict with the findings of this study.

The risky sexual behavior ranging from casual sex, to having more than one sex partner prevalent among academic staff and students of tertiary institutions remains a major risk factor to possible HBV transmission and infection. With about less than 2% of infected respondents relating in academic and social activities, there is a likelihood of engaging in illicit sex and with multiple partners which is a risk to spreading the virus.

5.1 Implication of the Findings for Health Security to Education

Although, the demographic data in table 1 shows that high proportion of 82% of academic staff of the institutions and 72.9% indicated negative on their HBV status, the respondents of 9% of academic staff and 27% who were uncertain, and those of about 2% of students that indicated positive are however a threat to the health security of not just to the academic staff and students in Nigeria tertiary institutions, but to the entire community of educational institutions and society at large. This is because, some people, according to Mitra et'al (2018) are infected without feeling sick or exhibiting any form of symptom. They can transmit the infection to others. Since most carriers are contagious - meaning they can spread the HBV for the rest of their lives, they are more likely to pass the virus to other people.

6. Conclusion

The result of the study showed the prevalence of risk factors of HBV is higher in male academic staff, than it is in female academic staff of higher institutions. The prevalence of the risk factors among students of tertiary institutions in Niger State could exist but with equal chances of being exposed to the risks by male and female students alike. The results of the study may be used in making a reliable conclusion concerning other tertiary institutions in Nigeria. This is because the identified health risk factors of HBV have gradually been increasing, especially, as some of the male academic staff, and many students indulge in illicit sex which is a common 'freedom practice' among the inhabitants of many tertiary institutions in Nigeria.

7. Recommendations

- Staff and students of institutions should ensure they are vaccinated against HBV so as to build immune defense against all odds.
- Educational programs should be organized by school authority, departmental organizations, clubs and societies of the various institutions to provide awareness and explanations on how infectious the disease could be so as to prevent its spread within the institutions.

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