



## TREATMENT-SEEKING BEHAVIOURS FOR HEPATITIS B VIRUS INFECTION AND DIRECT FINANCIAL BURDENS ON PATIENTS IN TERTIARY HEALTHCARE FACILITIES OF PLATEAU STATE

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### ABSTRACT

Hepatitis B virus is a major threat to public health worldwide with Nigeria being among the countries having the highest burden of the disease with a prevalence of 12.2%. The present study aimed to assess the treatment-seeking behaviours for Hepatitis B Virus infection, their predictors and the direct financial burden of the disease on patients receiving treatment at some tertiary hospitals in Plateau state. A cross-sectional, quantitative method was used during the study. Information on hepatitis B treatment-seeking behaviours among the randomly selected hepatitis B positive patients receiving treatment at the tertiary hospitals in Jos, Plateau state was collected using self-administered questionnaires. Direct financial costs incurred by patients during the treatment were also collected using self-reported cost of illness instruments. All descriptive and inferential analyses were conducted through Microsoft Excel and IBM® Statistical Package for Social Sciences® (IBM-SPSS®) version 25 software. The result showed most of the respondents (n = 95, 76.6%) sought for care at the hospitals, which is a positive treatment-seeking behaviour. Nineteen (19) (15.3%) of the respondents stopped treatment without being discharged by healthcare providers, with the majority of them ((n = 76, 61.3%) continuing with their treatment as recommended by healthcare providers. The results also suggested that the age (OR = 0.11, p = 0.000) and occupation of the respondents (OR = 5.76, p = 0.033) as well as consumers' evaluation from healthcare providers scores (OR = 2.52, p = 0.000) are significant (P < 0.05) predictors of treatment-seeking behaviours. The average direct financial cost of managing the disease per episode was ₦234,039.84 / 568.61USD, with 80.7% of the cost been direct medical cost and 19.3% constituting the direct non-medical cost. In conclusion, the study indicated positive treatment-seeking behaviour among HBV infected patients; with age (years old), occupations, and consumers' evaluation from healthcare providers' score as significant positive predictors. The study also revealed high direct medical cost of managing HBV infection.

**Keywords:** Direct financial burdens, Hepatitis B virus, Patients, Tertiary healthcare facilities, Treatment-seeking behaviour.

### INTRODUCTION

Hepatitis B virus (HBV) is a vaccine-preventable disease which has been reported to be 50-100 times more infectious than HIV with several modes of transmission, including the horizontal and the vertical

means of transmission (Federal Ministry of Health (FMoH), 2016). Chronic viral hepatitis B is a major threat to public health globally. There are nearly 257 million people living with the disease. The carriers of the virus are at higher risk of hepatocellular carcinoma (HCC) and end-

stage liver diseases (Nankya-Mutyoba *et al.*, 2019). In Nigeria, HBV has a prevalence rate of 12.5% and approximately 600 thousand to 1 million people die every year from serious consequences of HBV infection (Niederau, 2014; Olayinka *et al.*, 2016; World Health Organization (WHO), 2017).

It is a known fact that early and appropriate diagnosis and rational use of antiviral therapy results in a reduction in the risk of the disease progressing to chronic hepatitis B (CHB) disease. This is a crucial step for the reduction in HBV morbidity and mortality (Nankya-Mutyoba *et al.*, 2019; Mentock *et al.*, 2017).

However, early diagnosis depends largely on the patients' treatment-seeking behaviour (Kengeya-Kayondo *et al.*, 2014). The concept of treatment-seeking behaviours in the field of health refers to an active pursuit of treatment by a person who has a disorder or who wishes to improve his or her general mental or physical functioning. It involves actions taken by individuals who perceive themselves to have a health problem or ill for the purpose of finding an appropriate remedy (Olenja, 2015).

Inappropriate treatment-seeking behaviour has been linked to worse health outcomes, increased morbidity and mortality, in addition to high financial burden on patients (Mwase, 2015). Studies have shown that urban and rural dwellers in Nigerian have inappropriate treatment-seeking behaviour. In a study conducted in Nigeria, about 71% of rural dwellers have reported inappropriate treatment-seeking behaviour during their last illness episode while only 53% of urban dwellers reported inappropriate treatment-seeking behaviour during their last illness episode (Onwuyekwe *et al.*, 2011; Cornally and McCarthy, 2011). Many factors have been reported to significantly affect

treatment-seeking behaviour during illness episodes (Mackian, 2003; Geldster *et al.*, 2014; Zhang *et al.*, 2015).

Management of HBV infection has been reported to be associated with high economic burden. A study by Keshavarz *et al.* (2015) reported HBV infection as one of the diseases with a substantial economic burden. Similarly, results of study on economic burden of HBV infection in Iran by Mohammadzadeh *et al.* (2017) showed direct cost of HBV infection as 6436.93 PPP\$ annually for each patient suffering from the disease. The results of the study by Lu *et al.* (2013) also suggested management of HBV infection posing more medical challenge as it is a sizeable economic burden from both the payer and societal perspectives. To ascertain the extent to which financial resources are used during HBV treatment and demands on both the side of patients and healthcare systems in our societies, there is every need to evaluate such treatments and services rendered in term of their costs and consequences (Velentgas, *et al.*, 2013). The Cost of Illness (COI) studies, also known as burdens of illness studies, include the identification and estimation of various aspects of a disease impact (e.g. hepatitis), on the health outcomes (Cardell *et al.*, 2016). The analysis helps in knowing how much individuals / society is spending on a particular disease and by implication the amount that would be saved if the disease were abolished. It also helps in the identification of the different components of cost and the size of the contribution of each sector in society, which can be useful in determining research and funding priorities by highlighting areas where inefficiencies may exist and savings be made (Cardell *et al.*, 2016).

Available literature suggests that little is known about treatment seeking behaviour for HBV infection and its direct financial

cost implication on patients in Plateau state. Hence, the present research was aimed at assessing the treatment seeking behaviour of patients for HBV, their predictors and direct financial burden of the disease on patients.

## MATERIALS AND METHODS

### Study Design

A cross-sectional quantitative study was carried out to assess the treatment seeking behaviour of HBV-positive patients receiving treatment in three tertiary hospitals in Plateau state, Nigeria.

### Study Setting

The study was conducted in Jos University Teaching Hospital (JUTH), Bingham University Teaching Hospital (BUTH) and Plateau State Specialist Hospital (PSSH), which are 600-, 250- and 250-bed capacity tertiary hospitals, respectively, in Jos, Plateau state. These were chosen because most treatment for HBV infection are done in the tertiary hospitals for secondary and tertiary management.

### Study Population

The study population consisted of patients diagnosed and have been receiving treatment for HBV from 2015 up to 2021 (base on availability of data as at the time of the data collection for present study) in the selected tertiary healthcare facilities of Plateau state.

### Sample Size Calculation and Sampling Techniques

The sample size for the quantitative study was calculated in accordance with Mugenda and Mugenda, (2003) approach:

$$\text{Minimum sample size (N)} = \frac{Z^2PQ}{D^2}$$

Z=Standard normal deviation=1.96

P=Prevalence rate (Assume 0.08)  
(1<sup>st</sup> Nigeria Hepatitis Summit Report, 2019)

Q=1-P

D= Margin of error (0.05)

$$N = \frac{1.96^2 \times 0.08(1-0.08)}{0.05^2}$$

$$N = 0.2827/0.0025$$

$$N = 113.09 = 113$$

$$N = 113 + (10\% \text{ for attrition}) = 124$$

The three tertiary healthcare facilities used for the study were selected through convenience sampling method. Random sampling was used to select the required number of patients to represent the population; that is, during the selection, the sample individuals were chosen entirely by chance, such that each of the individual had the same probability of being chosen at any stage during the sampling process as they avail themselves for treatment.

### Inclusion and Exclusion Criteria

Patients of both gender and in the age range of 15-years old and above diagnosed with HBV and are assessing care in the selected healthcare facilities within the study period were included in the study. Hepatitis B positive patients with comorbid conditions were excluded from the study, in addition to hepatitis B positive patients that did not consent to participate in the study.

### Ethical Consideration

Research protocol for the study was presented and approval was granted by the respective Health Research and Ethics Committees of the three tertiary healthcare facilities, through approval letter reference number- JUTH/DCS/IREC/127/XXXI/2430 (JUTH), ethical clearance number-PSSH/ADM/ETH.CO/2019/005 (PSSH), and NHREC/21/05/00756 (BUTH). Patients' consents were also sought and all those who consented to participate in the study provided informed consent prior to any data collection.

## Data Collection

A self-administered questionnaire adopted from Bahrami *et al.* (2014) and Ismail *et al.* (2023) were employed for data collection. The instruments were used to extract relevant information on the respondents' demographics, treatment-seeking behaviour, factors responsible for treatment-seeking behaviour and direct financial burden incurred by the patients during treatment were obtained from patients' medical report at the outpatient and inpatient department of the three tertiary hospitals in Plateau state and based on patients' self-report.

## Data Analysis

All the filled and returned instruments were checked to ensure their completeness, after which the data were coded and entered into Microsoft Excel software<sup>®</sup>. Statistical analyses including descriptive and inferential statistics using IBM-SPSS<sup>®</sup> version 25 software were carried out on the data.

For the treatment-seeking behaviour aspect of the study, we analysed two choices among the respondents. The choices are; hospital and traditional medicine / others. Appropriate treatment-seeking behaviour was defined as consulting a qualified medical professional or seeking healthcare at orthodox healthcare facilities such as private clinics, primary health centres, and general hospitals during illness episodes or any situation requiring medical attention. While inappropriate treatment-seeking behaviour comprises seeking healthcare from traditional healers and other sources including family members or doing nothing at all. The factors influencing the choices of treatment-seeking behaviour like socio-economic and demographic factors, socio-cultural and familial factors, psychological factors as well as individual factors were evaluated.

Descriptive statistics, including the frequency and percentage distributions of both categorical and continuous variables, was carried out on the data. Also, the test of association between sociodemographic factors (independent variables) and treatment-seeking behaviour (dependent variable) of the respondents was evaluated using regression analysis at  $p < 0.05$ .

Finally, the direct costs incurred by patients due to HBV in the health facilities were evaluated using descriptive statistics – mean, SD, frequency and percentages. The direct costs included the patients' registrations, costs of laboratory diagnosis, costs of drugs (medical costs); and costs of transportation, feeding, and hospital bed for patients on admission (non-medical costs).

The direct cost in Nigerian Naira (₦) currency at ₦411.6 to 1USD (based on Nigerian central bank foreign exchange rate of 2021) was estimated using the following formulae:

Direct cost (DC) = Medical cost (MC) + non-medical cost (NMC), where,

- Medical cost (MC) = Patients registrations cost (PRC) + Laboratory diagnosis cost (LDC) + Cost of drugs (CoD)
- Non-medical cost (NMC) = Transportation cost (TC) + Feeding cost (FC) + Accommodation cost (AC)

## RESULTS

### Response Rate

All the questionnaires distributed to 124 respondents were completed and retrieved, representing a 100% response rate.

### Respondents' Demographic Characteristics

The majority of respondents were female (n = 65, 52.4%). Also, most of them were

above the age of 41 years, married (n = 58, 46.8%), had attended higher educational levels (n = 69, 55.6%), and were employed

(n = 64, 51.6%). Other demographic characteristics are shown in **Table 1**.

**Table 1: Socio-Demographic Characteristics of Respondents (N =124)**

<b>Variables</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>
<b>Gender</b>		
Male	59	47.6
Female	65	52.4
<b>Age (Years old)</b>		
<18	4	3.2
18-29	28	22.6
30-41	34	27.4
>41	58	46.8
<b>Marital Status</b>		
Never married	38	30.6
Married	72	58.1
Divorced/Widowed	14	11.3
<b>Levels of Education</b>		
No formal education	13	10.5
Primary education	12	9.7
Secondary education	30	24.2
Higher education	69	55.6
<b>Occupation</b>		
Student	11	8.9
Employed	64	51.6
Farmer/business	49	39.5
<b>Monthly Income</b>		
< 18,000	39	31.5
18,000 – 40,000	25	20.2
> 40,000	60	48.4

### **Patients' Treatment-Seeking Behaviours for Hepatitis B Virus**

Most of the respondents (n = 95, 76.6%) sought for treatment from the hospital while 20.2% said they patronised traditional healers for the management of their disease,

with only 3.2% who sought treatment from other sources. The respondents reported having different timing for seeking treatment. About 37 (29.8%) of the respondents indicated seeking treatment within a month, while 21.8% of them normally do that within the first week.

Furthermore, the respondents' stage of the disease influenced their treatment-seeking behaviour whereby half (n = 62, 50.0%) of them reported that they only sought treatment when there were noticeable disease symptoms. Less than half (n = 51, 41.1%) of the respondents sought treatment in the early stages and onset of mild symptoms. Furthermore, the majority of the

respondents (n = 76, 61.3%) reported that they only adhere to the course of treatment according to the healthcare provider's opinion until symptoms of the disease are relieved. Other respondents (n = 29, 23.4%) reported that they completed their treatment to recover from the illness (**Table 2**).

**Table 2: Respondents' Treatment-Seeking Behaviour for Hepatitis B Virus Infection (N = 124)**

Variables	Frequency (n)	Percentage (%)
Where to seek treatment in the first step		
Hospital	95	76.6
Traditional healers	25	20.2
Self-treatment	4	3.2
How soon did you seek treatment from a healthcare provider after the onset of the disease symptoms?		
Within the first week	27	21.8
Within a month	37	29.8
After one month	27	21.8
After a few months	33	26.6
At what stage of the disease have you gone to a healthcare provider?		
In the early stages and the onset of mild symptoms	51	41.1
Incidence of disease and its symptoms	62	50.0
In the serious stage of the disease	11	8.9
At what step of treatment have you completed your course of treatment according to the healthcare provider's opinion		
To recover	29	23.4
To relieve the symptoms	76	61.3
Do not complete my course of treatment	19	15.3

### Predictors of Treatment-Seeking Behaviour Scores with Independent Variables (Binary Logistic Regression)

The result of the Binary Logistic regression analysis (Table 3) revealed the independent predictors of treatment-seeking behaviour (either visiting hospitals or visiting traditional healers and Others). The respondents' age was observed to be a significant predictor of treatment-seeking behaviour (OR = 0.11, 95% CI: 0.03 – 0.35,  $p < 0.001$ ) with those who belonged to the younger age groups less likely to seek for treatment from hospital compared to the older categories. Similarly, respondents' occupation was another predictor of

treatment-seeking behaviour (OR = 5.76, 95% CI: 1.15 – 28.79,  $p < 0.001$ ). The odds of visiting hospital to seek for treatment for HBV when they noticed any onset of the disease symptoms was more likely among the employed categories compared to students. The other predictor of treatment-seeking behaviour was also observed to be Consumers' evaluation from healthcare providers' scores (OR = 2.52, 95% CI: 1.53 – 4.15,  $p < 0.001$ ). This shows that participants who were satisfied with the quality of services received from health care providers were more likely to seek for treatment in hospital when need arises.

**Table 3: Binary Logistic Regression Between Patients' Independent Variables and Treatment Seeking Behaviours (N = 124)**

	B	S.E.	Wald	Df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Gender	0.44	0.71	0.38	1	0.536	1.55	0.39	6.26
Age	-2.26	0.61	13.70	1	<0.001**	0.11	0.03	0.35
Marital status	-0.02	0.51	0.01	1	0.974	0.98	0.36	2.66
Level of education	0.69	0.46	2.30	1	0.130	2.00	0.82	4.88
Occupation	1.75	0.82	4.55	1	0.033*	5.76	1.15	28.79
Monthly income	0.45	0.53	0.72	1	0.395	1.57	0.55	4.48
Are you registered with any health-related insurance policy/scheme?	1.22	1.28	0.91	1	0.341	3.37	0.28	41.10
Are you able to afford your needed healthcare?	-0.66	0.39	2.85	1	0.091	0.52	0.24	1.11
Are you thinking about affording before you get the healthcare?	0.34	0.31	1.22	1	0.270	1.40	0.77	2.57
Patients' previous experience of services consuming score	-0.14	0.10	1.92	1	0.166	0.87	0.72	1.06
Consumers' evaluation from healthcare providers score	0.92	0.26	13.08	1	<0.001**	2.52	1.53	4.15
Psychological factors score	0.28	0.23	1.57	1	0.211	1.32	0.85	2.05
Cultural and familial factors score	-0.17	0.10	2.88	1	0.089	0.85	0.70	1.03
Constant	-21.70	7.35	8.72	1	0.003	0.00		

Note: \* = statistically significant at  $p < 0.05$ , \*\* = statistically significant at  $p < 0.005$

## Direct Cost of Managing HBV Disease

### Direct medical cost on patients

With a total registration cost of ₦221,100.00 / 537.17 USD paid by the study population, 33.33% of them paid an average of ₦1783.07 / 4.3USD as patient registration cost (PRC) before receiving treatment in the healthcare facilities which is equivalent to 1.1% of the total direct medical cost. The average cost for laboratory services (blood microscopy and other tests) paid by each patient amounted to ₦43,771.19 / 106.34 USD, accounting for 24.7% of the total direct medical cost. Similarly, 33.33% paid an average of ₦124,927.42 / 303.52 USD per drug prescription, including anti-HBV drugs and co-medications and this was the highest amount spent by the patients direct medical cost (74.2%) (Table 4).

### Direct non-medical costs on patients

Out of the 124 respondents that participated in the study, 52.94% of them spent approximately ₦26,517.48 / 64.48 USD on transportation accounting for 65.2% of the total direct medical cost. On the other hand, an average of ₦9,952.44 / 24.18 USD was spent on feeding by 34.39% of the patients. Furthermore, a total of ₦921,000.00 / 2237.61USD was spent on accommodation by 12.67% of them that were admitted, at a mean total accommodation cost of ₦27,088.24 / 65.81USD per patient for the entire number of days on admission (Table 4).

### Total direct cost incurred per patient in treating HBV disease

The average financial cost of managing paid (direct medical and non-medical costs) by patients in the selected healthcare facilities per episode was estimated to be ₦234,039.84 / 568.61USD, with the total cost of managing the disease among the study population per episode amounted to ₦25,875,850.00 / 62868.5USD (Table 4).

## DISCUSSION

The result showed majority of the respondents sought for care at the hospitals, which is a positive treatment-seeking behaviour; with many of them continuing with their treatment as recommended by healthcare providers. The study also indicated age (years old), occupation of the respondents, and consumers' evaluation from healthcare providers scores as statistically significant ( $P < 0.05$ ) predictors of treatment-seeking behaviours. The average direct financial cost of managing the disease (direct medical and non-medical costs) per episode was ₦234,039.84 / 568.61USD.

### Treatment-Seeking Behaviours for Hepatitis B Virus Infection

The greater percentage of the respondents (76.6%) who sought care at the hospital had positive treatment-seeking behaviour, and this was in contrast with result of similar study reported by Alegana *et al.* (2017), whereby only 30% sought for treatment from healthcare facilities. The outcome of our study also disagreed with the outcome of a study reported by Kengeya-Kayondo *et al.* (2014), who reported respondents using herbs as their preferred first treatment option, only turning to orthodox when there seemed to be no improvement with the earlier management approach. The outcome of present study also showed better treatment seeking behaviour compared to the outcome of similar study conducted by Onwuyekwe *et al.* (2011).



**Table 4: Direct Average and Total Costs Per Case of HBV Disease on Respondents in Study Area (in Naira (₦) / United State Dollar (USD)) (N = 124)**

Variables	n (%)	Total cost for study population ₦ / USD	Mean cost ₦ / USD	Standard deviation ₦/ USD	% cost
<b>Direct medical cost</b>					<b>80.7</b>
Registration	118 (33.33)	221,100.00 / 539 5,165,000.00 /	1783.07 / 4.33 43771.19 /	2240.27 / 5.44 53604.74 /	1.1
Laboratory	118 (33.33)	12548.59 15,491,000.00 /	106.34 124,927.42 /	130.23 131,515.94 /	24.7
Drugs	118 (33.33)	37636.05 20,877,100.00 /	303.52 170,481.68 /	319.52 187,360.95 /	74.2
Total	354 (99.99)	50721.81	414.19	455.20	100
<b>Direct non-medical costs</b>					<b>19.3</b>
Transportation	117 (52.94)	3,261,650.00 / 7924.32	26,517.48 / 64.43	34,912.85 / 84.82	65.2
Feeding	76 (34.39)	816,100.00 / 1982.75	9,952.44 / 24.18	15,436.50 / 37.50	16.3
Accommodation (when admitted)	28 (12.67)	921,000.00 / 2237.61	27,088.24 / 65.81	34678.06 / 84.25	18.5
Total	221 (100)	4,998,750.00 / 12144.68	63,558.16 / 154.42	85,027.41 / 206.58	100
<b>Total Direct Cost</b>	<b>575 (100)</b>	<b>62866.5</b>	<b>568.61</b>	<b>661.78</b>	<b>100</b>

Note: Exchange rate: ₦411.6= 1 USD (based on Nigerian Central Bank foreign exchange rate of 2021).

This positive treatment seeking behaviour observed among respondents might also influence their preventive approach and how they can carry out their medication practices based on instructions from healthcare practitioners for a desired therapeutic outcome (Hamza et al., 2017). The overall benefit would be achievement of possible desired therapeutic outcome of treatment.

With the economic difficulties being experienced in the country, even with positive treatment seeking behaviour among affected patients, there might be poor or delayed in seeking for treatment at the appropriate healthcare because of financial constraints. Previous studies have also reported poor patronage of clinics for self-

motivated chronic HBV infection treatment due to financial cost implications for the patients (Liu *et al.*, 2020; Zheng *et al.*, 2019). Furthermore, the delay in seeking treatment by the patients, waiting until symptoms become noticeable as seen in the outcome of the present study might worsen the condition. This is because early treatment-seeking behaviour has been reported to facilitate the healing processes of ailments, including communicable and chronic illnesses like chronic HBV infection at minimal cost to patients, while delay in seeking treatment negatively affects the management and outcomes of the ailments (Niederau, 2014; Zhang *et al.*, 2015; WHO, 2017). Hence, it would be necessary to

encourage people to seek care even before the onset of symptoms or as soon as symptoms are noticed, not until the symptoms become severe. Similarly, this study revealed that the majority of the respondents only adhered to the course of treatment based on healthcare providers' prescriptions just to be relieved of the symptoms of the disease, with only a few of them completing their prescribed medications for the purpose of recovering from the illness. This is an indication of poor treatment-seeking behaviour for the disease. Treatment-seeking is not homogenous depending on cognitive and non-cognitive factors that call for a contextual analysis of care-seeking behaviour.

There was a statistically significant relationship between some of the socio-demographic characteristics (age and occupation) and the respondents' treatment-seeking behaviours in the present study. Similar relationships between treatment-seeking behaviours and individual characteristics, including socio-demographic predisposing factors (e.g., age, gender, ethnicity, education, and family status), enabling factors (financial situation/income) and need factors (e.g., severity of disease, comorbidity, and duration and number of episodes) have been reported in different studies (Sahimin *et al.*, 2016; Wong *et al.*, 2008; Naing *et al.*, 2012). The interplay of these factors is central to the final choice of a care-seeking option. Although, the result of the present study showed age and occupation as statistically significant predictors of treatment-seeking behaviours of respondents for HBV management, this was in disagreement with the outcome of a study conducted by Peng *et al.* (2010) who reported gender, age, and occupation not having influence on the respondents' tendency to seek for treatment. These authors have also reported poor treatment-

seeking behaviour among less educated categories and those with less household income in China (Peng *et al.*, 2010). Guntur *et al.* (2022) also reported the absence of significant relationships between certain occupations and treatment-seeking behaviours. The statistically significant and positive relationship between treatment-seeking behaviour and occupation of the respondents in our study was an indication that the employed categories were more likely to have good treatment-seeking behaviours than others just as reported also by Ihaji *et al.* (2014). This could be possible considering the severity of HBV infection symptoms which might stimulate the patients to urgently seek treatment irrespective of their income. In addition, the educational levels of the respondents could be a contributing factor as the majority of them (55.6%) have attained higher level of education which is expected to influence their levels of awareness regarding the diseases and its consequences, thereby encouraging them to make informed decisions about treatment seeking.

The lack of association between treatment-seeking behaviour and gender was in agreement with the finding of a similar research by Thompson *et al.* (2016) where Patients' self-reports amongst Canadians indicated that there were gender differences in treatment-seeking behaviour, with women reporting they visited their primary care provider to a greater extent than did men for both physical and mental health concerns. Regarding the age of the respondents, the significant relationship between treatment-seeking behaviour and age agreed with the results of studies reported by Ihaji *et al.* (2014) and Mburu *et al.* (2021), and in contrast with the results of similar research carried out by Lim *et al.* (2019) which reported no association between treatment-seeking behaviour and age. Also, there was an association between treatment seeking

behaviour and Consumers' evaluation from healthcare providers' score of the respondents. The effect of Consumers' evaluation from healthcare providers' scores was also significant and positive, indicating that the employed categories were more likely to have good treatment-seeking behaviours than others. The OR showed the employed categories had 2.52, times more odds of achieving good treatment-seeking behaviours compared to the students and farmers/business categories of the respondents.

### **Direct Financial Cost of Managing HBV Infection**

The result of the present study revealed that HBV-related diseases imposed considerable direct financial burden on patients and their families within the study area, with direct medical costs constituting 80.7% and 19.3% for direct non-medical cost. This finding agrees with the outcome of a similar study conducted among inpatients in Shandong, China (Lu, et al., 2013), and Iran (Keshavarz et al., 2015; Mohammadzadeh *et al.* 2017). For the average direct medical cost of treating the disease per case, the 74.2% of the cost due to drugs was the highest. The high amount could be as a result of the fact that HBV infection has been seen as a chronic illness which requires continuous medication for long term and in some cases where complications are reported, other drugs for those complications are administered and it is compiled all together because HBV is the underlying disease (Lu, et al., 2013). Regarding the laboratory cost, although, lower than the 624.9USD cost reported by Mohammadzadeh et al. (2017) in Iran, considering the economic situation of Nigeria and poverty levels of the citizens, the reported amount in the present study might be considered high. The high amount might possibly be due to the fact that there were usually series of tests including Viral load, PCR, Liver biopsys, and biochemistry

that are normally conducted to establish the disease and its stage to ascertain the extent of damage to some organs resulting to some complications which could lead to other disease.

For the direct average annual non-medical cost, cost of transportation (₦26,517.48 / 64.43USD) took the bulk of the amount, and this might not be unconnected with the chronic nature of the illness which requires repetitive hospital visits and, in some instances, patients' relatives who might play the role of care givers also accompany them to the healthcare facilities, which further justify the high cost of transportation. Similarly, the high cost of accommodation (₦27,088.24 / 65.81USD) might possibly be linked to the fact that such healthcare facilities are tertiary health facilities with high volume of patients, with many of them coming from outside Jos, who sometimes pay for themselves and also the care giver. Annual average cost of feeding of ₦9,952.44 / 24.18USD could be due to the fact that the cost of living in the study area might be low, so generally, feeding isn't too high.

### **Limitations of Study**

The study was limited to only tertiary healthcare facilities in Jos, without extending the same to other lower-levels of secondary and primary, and private healthcare facilities in the state. This affects the generalizability of the findings. Study methods might have left room for personal influence and biasness in findings due to "hawthorne" effect and incomplete data.

### **Conclusions**

Treatment-seeking behaviour among HBV-infected patients was not bad in the three tertiary health institutions of Plateau state. Age (years old), occupations, and consumers' evaluation from healthcare providers' scores were significant predictors

of treatment-seeking behaviour. There was a high direct medical cost of managing HBV infection. These findings should be utilised by health policy makers to understand actual HBV patients' treatment-seeking, the financial burden of the treatment, and ways of mitigating the burden of the disease and its high direct cost of management.

### Contributions to Knowledge

These findings have important policy implications for health care reform efforts currently underway in Plateau state focusing on how to reduce the burden of catastrophic disease for its citizens. Evidence from this study would also contribute to understanding of potential benefits to society from allocating more resources to preventing and treating HBV infection, as well as increasing insurance coverage in Plateau state.

### REFERENCES

- Alegana, V.A., Wright, J., Pezzulo, C., Tatem, J.A., & Atkinson, P.M. (2017). Treatment-seeking behaviour in low and middle-income Countries estimated using Bayesian model. *Medical Research Methodology*, 17, 67,70.
- Bahrami, M.A., Atashbahar, O., Shokohifa, M., & Montazeralfara, A. (2014). Developing a valid tool of treatment seeking behaviour survey for Iran. *Journal of Novel Applied Sciences*, 6, 651, 660.
- Cardell, L.O., Olsson, P., Andersson, M., Welin, K.O., Svensson, J., Tennvall, G.R., & Hellgren J. (2016). High cost of allergic rhinitis-A National Swedish population-based questionnaire study. *Primary Care Respiratory Medicine*, 20, [15082](#), 15090.
- Cornally, N., & McCarthy, G. (2011). Help-seeking behaviour: A concept analysis. *International Journal of Nursing Practice*, 27, 280, 288.
- Federal Ministry of Health, Nigeria (2016). National Guidelines for the Prevention, Care and Treatment of Viral Hepatitis B and C in Nigeria. National AIDS/STIs Control Program.
- Geldsetzer, P., Williams, T.C., & Kirolos, A. (2014). The recognition of and care seeking behaviour for childhood illness in developing countries: a systematic review. *Public Library of Science*, 9, e93427.
- Guntur, R. D., Kingsley, J., & Islam, F. M. A. (2022). Malaria treatment-seeking behaviour and its associated factors: A cross-sectional study in rural East Nusa Tenggara Province, Indonesia. *PLoS One*, 17(2): e0263178. doi: 10.1371/journal.pone.0263178.
- Hamza, T. A., Azmach, N. N., & Abdella, A. (2017). Community knowledge, attitude and practice about malaria and mosquito biting behavior in Southern Ethiopia. *American Journal of BioScience*, 5(5), 80-8. doi: 10.11648/j.ajbio.20170505.12
- Ihaji, E., Gerald, E. U., & Ogwuche, C. H. E. (2014). Educational Level, Sex and Church Affiliation on Health Seeking Behaviour among Parishioners in Markurdi Metropolis of Benue State. *Journal of Educational Policy and Entrepreneurial Research*, 1, 311, 316.
- Ismail, N. E., Jimam, N. S., Goh, K. W., Tan, C. S., & Ming, L. C. (2023). Economic Burdens of Uncomplicated Malaria in Primary Health Care (PHC) Facilities of Plateau State, Nigeria: Patients' Perspectives. *International Journal of Environmental Research and Public Health*, 20, 1093. <https://doi.org/10.3390/ijerph20021093>
- Kengeya-Kayondo, J.F., Selly, J.A., Kajwia-Bajenga, E., Kabunga, E., Mubiru, E., Sembajja, F., & Mulder, D.W. (2014). Recognition, treatment seeking behaviour and perception of cause of malaria among rural women in Uganda. *Health Services Research*, 60, 31, 40.
- Keshavarz, K., Kebriaeezadeh, A., Alavian, S.M., Sari, A.A., Dorkoosh, F.A., Keshvari, M., Malekhosseini, S.A., Nikeghbalian, S., & Nikfar, S. (2015). Economic burden of Hepatitis B virus-related diseases: Evidence from Iran. *Hepatitis Monthly*, 15(4), 25854.
- Lim, M.T., Lim, Y.M.F., Tong, S.F., & Sivasampu, S. (2019). Age, sex and primary care setting differences in patients' perception of community healthcare seeking behaviour towards health services, *Public Library of Science*, 14, 10.
- Liu, H., Xu, J., Ai, Z., Yu, Y., & Yu, B. (2020). Treatment seeking behaviour and associated factors of suspected dengue fever among Shan people in eastern Shan special region IV, Myanmar: a cross-sectional study. *Biomed Central Health services research*, 20, 318.

- Lu, J., Xu, A., Wang, J., Zhang, L., Song, L., Li, R., Zhang, S., Zhuang, G., & Lu, M. (2013). Direct economic burden of hepatitis B virus related diseases: evidence from Shandong, China. *BMC Health Services Research*, 13:37. doi:10.1186/1472-6963-13-37
- MacKian, S. (2003). A review of health seeking behaviour: problems and prospects. *Health Systems Development Programme*, 1, 3.
- Mburu, C.M., Bukachi S.A., Shilabukha, K., Tokpa, K.H., Ezekiel, M., Fokou, G., Bonfoh, B., & Kazwala, R. (2021). Determinants of treatment-seeking behaviour during self-reported febrile illness episodes using the socio-ecological model in Kilombero District, Tanzania. *BioMed Central Public Health*, 21, [1075](#).
- Mentock, S.M., Ng, V.V., Narayana, R., Ullal, H., Kumari, S., Badiger, S., & Shetty A.K. (2017). Treatment-seeking behaviour and obstacles to treatment compliance in diabetic patients in Mangaluru, India. *Diabetes & Metabolic Syndrome: Clinical Research and Review*, 11,617, 622.
- Mohammadzadeh, M., Fattahi, B., & Ghari, T. (2017). The Estimation of Economic Burden of Hepatitis B Virus Infection in Iran. *Hepatology Journal*, 17,1,40541.
- Mugenda, M.O. & Mugenda, A.G. (2003), Research methods. Qualitative and quantitative approach, ACTS press; Nairobi
- Mwase, I. (2015). Social capital and household health seeking behaviour for children in the context of urban neighbourhoods. *The case of Khayelitsha in Western Cape, South Africa: University of Cape Town*, 32, 60.
- Naing, T., Geater, A., & Pungrassami, P. (2012). Migrant workers' occupation and healthcare-seeking preferences for TB-suspicious symptoms and other health problems: a survey among immigrant workers in Songkhla province, southern Thailand. *BioMed Central International Health and Human Rights*, 12, 22.
- Nankya-Mutyoba J., Aizire J., Makumbi F., Ocamo P., & Kirk G. D. (2019). Hepatitis B virus perceptions and health seeking behaviours among pregnant women in Uganda: implications for prevention and policy. *BMC Health Services Research*, 19, 760. Doi.org/10.1186/s12913-019-4516-0
- Niederau, C. (2014). Chronic hepatitis B in 2014: Great therapeutic progress, large diagnostic deficit. *World Journal Gastroenterology*, 20, 11595, 11617.
- Olayinka, T.O., Oyemakinde, A., Balogun, M. A., Ajudua, A., Nguku, P., Aderinola, M., Egwuenu-Oladejo, A., Ajisegiri, S.W., Sha'aibu, S., Musa, B.O.P., Gidado, S., & Nasidi, A (2016). *The American Journal of Tropical Medicine and Hygiene*, 95, 902, 907.
- Olenja, J. (2015). Health seeking behaviour in context. *East African Medical Journal*, 50, 61.
- Onwujekwe, O., Onoka, C., Uzochukwu, B., & Hanson, K. (2011). Constraints to universal coverage: inequities in health service use and expenditures for different health conditions and providers. *International Journal for Equity in Health*, 10, 1, 50.
- Peng, Y., Chang, W., Zhou, H., Hu, H., & Liang, W. (2010). Factors associated with health-seeking behaviour among migrant workers in Beijing, China. *BioMed Central Health Service Research*, 10, 2, 4.
- Sahimin, N., Lim, Y.A.L., Ariffin, F., Behnke, J.M., Lewis, J.W., & Zain, S.N.M. (2016). Migrant workers in Malaysia: current implications of sociodemographic and environmental characteristics in the transmission of intestinal parasitic infections. *Public Library of Science Negligible Tropical Disease*, 10,9, 10.
- Thompson, E.A., Anisimowicz,., Miedema,., Hogg W., Wodchis W.P., & Aubrey-Bassler, K. (2016). The influence of gender and other patient characteristics on health care-seeking behaviour: a QUALICOPC study. *BioMed Central Family Practice*, 10, 11.
- Velentgas, P., Dreyer, N.A., & Wu, A.W. (2013). Outcome Definition and Measurement. *Developing a Protocol for Observational Comparative Effectiveness Research: A User's Guide*. Retrieved March 28 from <https://www.ncbi.nlm.nih.gov/books>.
- Wong, D.F.K., He, X., Leung, G., Lau, Y., & Chang, Y. (2008). Mental health of migrant workers in China: prevalence and correlates. *Social Psychiatry Epidemiology*, 43, [483,489](#)
- World Health Organization. Global hepatitis report (2017). Geneva: *World Health Organization*

Zhang, Z., Chen, C., Liz, G., Wu, Y.H., & Xiao, X.M., (2015). Individualised management of pregnant women with high hepatitis B virus DNA levels. *World Journal Gastroenterol*, 20,12056, 12061.

Zheng, H., Zhang, G., Wang, F., Yin, Z., Miao, N., Sun, X., Liang, G., & Cui, F., (2019). Self-motivated medical care-seeking *behaviours* and disease progression in a community-based Cohort of chronic hepatitis B virus infected patients in China. *BioMed Central Public Health*, 19, 901, 910.