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Knowledge of Hepatitis B Virus and Vaccination Uptake among Pregnant Women in Rural North Gonja of the Savanah Region, Ghana

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Purpose: Hepatitis B viral(HBV) infection is a global public health challenge. Mother to child transmission is the leading cause of HB Vinfection in high endemic countries. The objective of this study was to examine pregnant women's knowledge of HBV and their vaccination uptake in the North Gonja District of the Savanah Region of Ghana.

Methods: A facility-based cross-sectional study was conducted in five Health centres and five Community-based Health Planning and Services(CHPS) compounds.Data was collected from April to June 2020 using a structured questionnaire. Data on socio-demographic characteristics,HBV Knowledge, testing and vaccination uptake among 310 pregnant women attending ante-natal clinics (ANC) were collected using a simple random sampling method. The data was analyzed using Microsoft Excel version 2019 and IBM SPSS v25. Results were presented as frequencies, percentages, tables and figure. A chi-square test of associations was performed and a P-value of <0.05 was considered statistically significant.

Results: In all, 43.25% of the respondents had excellent knowledge, 21.94% had good knowledge whilst 34.84% had poor knowledge. There was a statistical association between educational level (p=0.002), ANC visit (p<0.001), ethnicity (p<0.001), occupation(p<0.011) and knowledge of HBV.

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HBV testing and vaccination uptake were only 35.5% and close to 33% respectively. Educational level (p<0.001), previous HBV screening (p<0.001), occupation (p<0.001), knowledge of HBV(p<0.001), ANC visit(p=0.002) were significantly associated with Hepatitis B virus vaccination uptake.

Conclusion: Pregnant women were knowledgeable of HBV. However, HBV testing and vaccination uptake were low. Pregnant women attending ANC should be screened for hepatitis B. Vaccination of pregnant women against HBV should be introduced into the EPI program.

Keywords: Knowledge; Hepatitis B; vaccination uptake; pregnant women; North Gonja.

1. INTRODUCTION

Hepatitis B(HBV) infection is one of the leading causes of morbidity and mortality in the world, resulting in about 38-53% of cases of chronic liver diseases and about 887,000 deaths annually [1]. In Sub-Saharan Africa, the prevalence of HBV infection is 9 – 20% and in Ghana, it is about 12.3% among the general population and 13.1 % among pregnant women, this exceeds the (≥8%) threshold for high endemic countries [1,2]. Mother to child transmission of HBV is still the principal route of becoming a chronic HBV infection carrier, thus about 95% of infections are acquired during the perinatal period as compared to only 5% for those acquired during adulthood [2,3].

The most effective intervention to avert mother to child spread of HBV is through early detection of HBV s among infected pregnant women and place under appropriate treatment and management [4,5]. Public health interventional programmes such as the Universal HBV Immunization Programme(UHBVIP) has been recommended by the World Health Organization (WHO) and adopted by several countries [6,7] The UHBVIP targets pregnant women and children, intending to offer the first dose of HBV vaccines at birth [7]. Multiple studies and reports have given enough evidence of the effectiveness of UHBVIP in reducing the occurrence and prevalence of HBVin many endemic countries [7,8]. Many countries in sub-Saharan Africa are at different phases of introducing HBV vaccines into primary health care [7]. In Ghana, the UHBVIP Immunization Programme was introduced into the Expanded Programme on Immunization(EPI) in 2002 and all pregnant women visiting antenatal clinics (ANC) are to be tested for HBV irrespective of their status; thus has been tested and taken the vaccine previously or not [8].

Good knowledge of HBV among pregnant women is the most effective way to improve testing and vaccination against HBV infection [9]. However, several studies have reported inadequate knowledge of HBV among pregnant women [10,11]. A study conducted in Northern Vietnam showed limited knowledge of HBV infection, irrespective of their age, household wealth and educational level [9]. Two studies conducted in Nigeria and Cameron respectively also reported inadequate knowledge of HBV among pregnant women [11,12]. A similar study conducted among pregnant women in the Kintampo North Municipal, Ghana, reported over 50% of the respondents were not aware of HBV infection [13]. In Gushegu Municipal, Ghana, a previous study reported that only 47.5% of the study respondents have heard of HBV [14]. Two studies conducted in Nigeria and one in Ghana all reported low HBV vaccination uptake [14-16]. In Ghana, some previous studies have looked at the prevalence, knowledge, attitudes and practice of pregnant women towards HBV. However, those studies were limited to regional and district hospitals. This current study was therefore conducted in some selected Community-based Health Planning and Service(CHPS) compounds and health centres in a deprived district of Ghana [17] to assess the level of knowledge of HBV and uptake of HBV vaccines among pregnant women in the rural communities.

2. MATERIALS AND METHODS

2.1 Study Design and Setting

A facility-based cross-sectional study was conducted from April to June 2020. The study was conducted in ten health facilities in the North Gonja District of the Savannah Region, Ghana. The health facilities consisted of five CHPS compounds and five health centres.

2.2 Study Population

All pregnant women attending ANC at the selected health facilities were considered the population of this study. Pregnant who have

received information about HBV before or during their current pregnancy were included on to the study. Participation was limited to only those who have provided written consent (thumbprint/signed).

2.3 Sample Size Determination

The sample size was calculated using the Cochran (1977) formula given by;$\mathbf{n_0=(z)^2\ x\ (p)(q)/(e)^2}$.Where n_o = sample size, z=standard error, p=estimated proportion, q=1-p and e^2= acceptable sample error.

For a point estimate sample size determination at a confidence level of 95%, a margin of error of 5%, women in reproductive ages(WIFA) of 22.8% of the district total population [17] and a non-response rate of 25%. The final sample size was therefore 310.

2.4 Sampling Technique and Selection of Respondents

The study adopted a multi-stage sampling technique. First purposive sampling method was used to select five CHPS compounds and five health centres with the highest ANC attendance in the study district.

Second, using the ANC record books as the sample frame, we sampled respondents at each health facility proportional to the facility ANC registrants.

Finally, a simple random sampling was used to select respondents at the various health centres and CHPS compounds during each ANC section. Respondents were numbered and a sample gap of 2 was used to select pregnant woman in the queue until the required numbered was obtained from each of the facilities.Typically, between 2 and 4 days were spent at each of the facilities during the data collection process.

2.5 Data Collection

Data collection was done using a structured questionnaire. The socio-demographic characteristics questions consisted of ten (10) variables, twelve (12) variables each were used to assess knowledge of HBV and HBV testing and vaccination uptake among study respondents. To assess knowledge level, a score of one (1) was given for each correct knowledge question and zero (0) for incorrect answers. Based on the cumulative score from the knowledge questionnaire, respondents were classified as Excellent, Good and Poor (>79% “Excellent”, 60-79, “Good” and <60 “Poor”) [18].

Chi-square test analysis was performed to test the statistical association between the socio-demographic characteristics and knowledge on HBV and factors associated with HBV vaccination uptake among the study respondents. In all the analyses, p-values of <0.05 were considered statistically significant.

3. RESULTS

3.1 Socio-demographic Characteristics of the Respondents

From the study, a total of 310 pregnant women participated in the study. The minimum and maximum ages were 14 and 44 years respectively. Within the ages, most of the respondents (25.8%) were between the ages of 30 to 34 years. The majority of the respondents were married (89.6%) whilst 68.7% of them had no education. Again, the majority of the respondents (79.7%) were Muslims and 41.3% of the respondents were in the second trimester of their gestation. 69% of the respondents attend ANC at a health centre. Also, more than half of the respondents were housewives (Table1).

3.2 Knowledge of Hepatitis B Among Pregnant Women

From the study, only 310 of the respondents have heard of HBV before or during their current pregnancy and were therefore included into the study.A majority of the respondents have received HBV information from health staff (65.2%). In the study, only 45.5% of the respondents knew about the signs and symptoms of HBV. Of the 45.50% of those who knew the signs and symptoms, 70.2% mentioned fever whilst 8.5% mentioned the loss of appetite. Moreover, 55.5% of the respondents believe HBV could lead to chronic liver diseases. On whether HBV can be prevented, 67.4% believed it can be prevented and more than half said the infection can be prevented through vaccination. However, most of the respondents (42.9%) do not know the best time to provide a newborn with the first dose of the HBV vaccine (Table 2).

3.3 Overall knowledge of Hepatitis B Virus among Respondents

Analysis of the composite score of all the twelve knowledge variables revealed that, out of the 310

respondents, 43.25% of the respondents had "excellent knowledge", 21.94% had "Good" and 34.84% were classified as "poor knowledge" (Fig. 1).

3.4 Association between Socio-demographic Characteristics and Knowledge of HBV among Pregnant Women

Table 3 revealed that a chi-square test of independence showed a significant association between Marital status and knowledge on HBV with (χ^2= 17.153, df=6, p=0.009). The results showed a significant statistical association between Ethnicity and knowledge on HBV (χ^2=46.770, df=6 p<0.001), there was an equally significant association between the educational level of respondents and knowledge level on HBV (χ^2= 20.892, df=6, p=0.002). The respondents' occupations were associated with their knowledge of HBV at (χ^2= 19.939, df=8, p=0.011). Parity and ANC attendance were also associated with knowledge on HBV at (χ^2= 14.587, df=4, p=0.006) and (χ^2= 21.467, df=2, p<0.001) respectively. However, Age group and gestational period and religious affiliation of the pregnant women had no significant statistical association with knowledge of HBV (Table 3).

Table 1. Demographic characteristics of pregnant women attending ANC in the North Gonja District, Ghana (n=310),2020

Variables	Categories	Frequency	Percentage
Age	14 -19	32	10.3
	20-24	76	24.5
	25-29	84	27.1
	30-34	80	25.8
	35 & above	38	12.3
Marital Status	Single	17	5.5
	Cohabiting	8	2.6
	Married	278	89.6
	Divorce/separated/window	7	2.3
Religion	Christianity	59	19.0
	Islam	247	79.7
	Traditional	4	1.3
Ethnicity	Tampulma	148	47.7
	Mamprusi	47	15.2
	Gonja	64	20.6
	Other	51	16.5
Educational level	No education	213	68.7
	Primary	46	14.8
	Secondary	47	15.1
	Tertiary	46	1.3
Occupation	Farming	103	33.2
	Housewife	163	52.6
	Trader	36	11.6
	Professional	2	0.6
	Others	6	1.9
Parity	No birth	41	13.2
	1-5 children	230	74.2
	6-10 children	39	12.6
Gestation period	First trimester	79	25.5
	Second trimester	128	41.3
	Third trimester	103	33.2
ANC visit	Yes	25	8.1
	No	285	91.9
Type of health facility	CHPS Compound	95	30.6
	Health Center	215	69.4

Abbreviations: *CHPS: Community-based health planning and services, ANC: Antenatal care*

Table 2. Knowledge of Hepatitis B among pregnant women

Variables	Categories	Frequency	Percentage
Have you heard of HBV before or during your current pregnancy? (Screener question)	Yes	(310)	96.3
	No	12	3.7
What was your main source/s of information on HBV?	Health Staff	201	65.2
	Community member	30	9.6
	Family member	9	2.7
	Media (TV/Radio)	70	22.5
Do you know about the sign and symptoms of HBV?	Yes	141	45.5
	No	169	54.5
What are the signs and symptoms of HBV?	Dark urine	3	2.1
	Fatigue	8	5.7
	Fever	99	70.2
	Jaundice	7	5.0
	Joint pains	6	4.3
	loss of appetite	12	8.5
	Nausea	3	2.1
	Vomiting	3	2.1
What are the health risks of HBV?	Chronic liver diseases	172	55.5
	low birth weight	6	1.95
	maternal death	49	15.8
	preterm babies	44	14.2
	Stillbirth	39	12.6
Can HBV be prevented?	Yes	209	67.4
	No	101	32.6
Can vaccine prevent HBV?	Yes	197	63.5
	No	9	2.9
	Don't know	104	33.5
Can an infected person transmit HBV?	Yes	188	60.6
	No	122	39.4
What is the best time to provide a newborn with the first dose of HBV vaccine?	1 month old	49	15.8
	2-7 days after birth	87	28.1
	within 24 hours of birth	41	13.2
	Don't Know	133	42.9
Can avoiding reuse or sharing of injection prevent HBV needles/syringes?	Yes	218	70.3
	No	92	29.7
Can the use of condoms prevent HBV transmission?	Yes	195	62.9
	No	115	37.1
HBV can be prevented by the proper screening of blood before transfusion?	Yes	230	74.2
	No	80	25.8

3.5 Hepatitis B Virus Vaccination Uptake among Pregnant Women

Out of the 310 respondents recruited into the study, 85.5% sees HBV testing as necessary. It was revealed that only 35.20% had ever tested for hepatitis B. Majority of the respondents who had ever tested for hepatitis B paid for the test. On hepatitis B vaccination, only 32.3% of the study respondents have ever received HBV vaccination, from which the majority (87.00%) had received the three dosages as recommended. For those who had never received the vaccine cited, "it's expensive" (40%), "I am aware of my status" (29.52%), "don't know where to go for the vaccination" (14.29%) explaining why they have not received the HBV vaccination (Table 4).

3.6 Association between Hepatitis B vaccination Uptake and other Categorical Variables

From Table 5, the study established a significant statistical association between age-group and HBV vaccination uptake at (X^2 =11.368, df=4, p=0.023). Marital status was significantly associated with HBV vaccination uptake at (X^2

=11.332, df=3, p=0.010). Ethnicity was found to have strong evidence of a relationship with the uptake of the HBV vaccine (X^2 =30.380, df=3, p<0.001). from the study, educational level was significantly associated with HBV vaccination at (X^2 =33.838, df=3, p<0.001). Again, occupation had significant association with HBV vaccination ((X^2 =20.181, df=4, p<0.001). Equally associated with HBV vaccination uptake were, Distance to health facility ((X^2 =12.388, df=1, p=0.001), ANC visit ((X^2 =9.937, df=, p=0.002), previous HBV test (X^2 =113.344, df=1, p<0.001) and knowledge of HBV (X^2 =80.782, df=2, p<0.001). All other variables were no statistically significant with HBV vaccination uptake (Table 5).

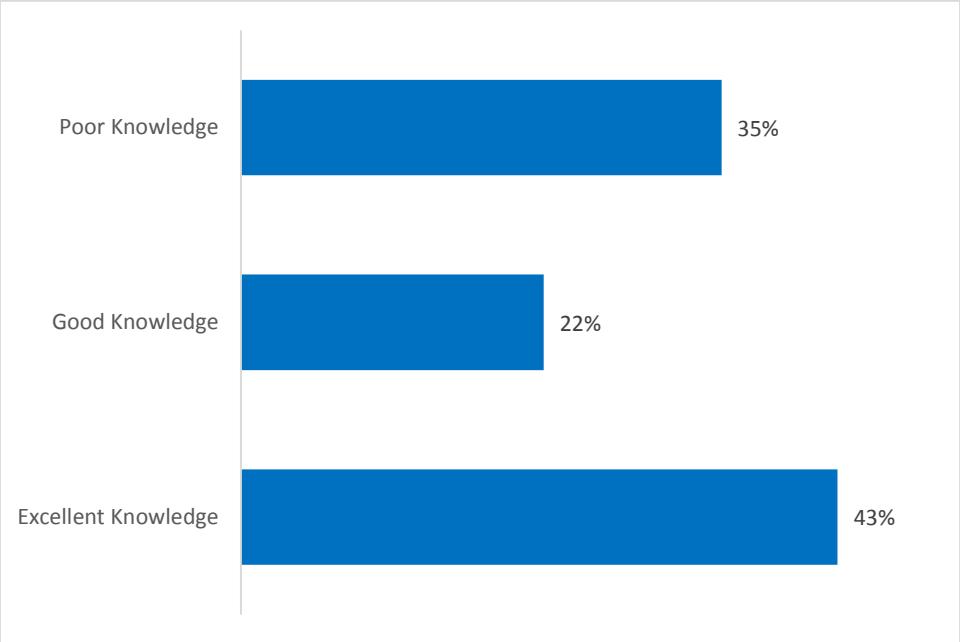

Fig. 1. Distribution of Knowledge Score of HBV among pregnant women, North Gonja (n=310),2020

Table 3. Association between Demographic& Obstetrics Characteristics and Knowledge of Hepatis B virus

Parameters	Categories	Excellent knowledge	Good knowledge	Poor knowledge	X^2	df	P-value 0.05
Total respondents		134(43.2%)	68(21.9%)	108(34.8%)			
Age	14-19	10(3.2)	8(2.6)	14(4.5)	8.413	8	0.391
	20-24	39(12.6)	16(5.2)	21(6.8)			
	25-29	42(13.5)	17(5.5)	25(8.1)			
	30-34	29(9.4)	19(6.1)	32(10.3)			
	35 & above	14(4.5)	8(2.6)	16(5.2)			
Marital status	Married	119(38.4)	62(20.0)	96(31.0)	17.153	6	<0.001**
	Single	9(2.9)	6(1.9)	3(1)			
	Cohabiting	1(0.3)	0(0)	7(2.3)			
	Divorce	5(1.6)	0(0)	2(0.6)			
Religion	Christianity	34(11.0)	7(2.3)	18(5.8)	8.683	4	0.07
	Islam	98(31.6)	61(19.7)	87(28.1)			
	Traditional	2(0.6)	0(0)	3(1)			
Ethnicity	Tampulma	81(26.1)	16(5.2)	51(16.5)	46.770	6	<0.001**
	Gonja	29(9.4)	21(6.8)	17(5.5)			
	Mamprusi	7(2.3)	23(7.4)	18(5.8)			
	Others	17(5.5)	8(2.6)	22(7.1)			

Educational level	No Education	80(25.8)	44(14.2)	89(28.7)	20.892	6	0.002*
	Primary	26(8.4)	7(2.3)	13(4.2)			
	SHS	26(8.4)	16(5.2)	5(1.6)			
	Tertiary	2(0.6)	1(0.3)	1(0.3)			
Occupation	Farming	43(13.9)	14(4.5)	46(14.8)	19.939	8	0.011*
	Housewife	67(21.6)	41(13.2)	55(17.7)			
	Trading	21(6.8)	10(3.2)	4(1.3)			
	Professional	2(0.6)	0(0)	1(0.3)			
	Others	1(0.3)	3(1)	2(0.6)			
Parity	No child	10(3.2)	13(4.2)	18(5.8)	14.278	4	0.006*
	1-5 children	113(36.5)	47(15.2)	70(22.6)			
	6 &over	11(3.5)	8(2.6)	20(6.5)			
Gestation Period	First Trimester	29(9.4)	16(5.2)	34(11.0)	4.278	4	0.370
	Second Trimester	56(18.1)	32(10.3)	40(12.9)			
	Third Trimester	49(15.8)	20(6.5)	34(11.0)			
Antenatal visit	No	2(0.6)	4(1.3)	19(6.1)	21.467	2	<0.001**
	Yes	132(42.6)	64(20.6)	89(28.7)			

Chi2 p=0.05 was statistically significant. the number of Asterix p=0.2, p<0.001** shows the strength of the association. df=degree of freedom*

Table 4. Hepatitis B Virus Vaccination uptake among pregnant women

Variables	Categories	Frequency	Percentage
Is HBV testing necessary for pregnant	Yes	266	85.8
	No	44	14.2
Have you tested for HBV before	Yes	109	35.2
	No	201	64.8
Where did you test for HBV	Health facility outside the district	8	7.3
	Health facility within the district	16	14.7
	At pharmacy	7	6.4
	in this community	67	61.5
	private health facility	11	10.1
Did you pay for the testing	Yes	75	68.8
	No	34	31.2
Are you willing to disclose your HBV status	Yes	100	91.1
	No	9	8.9
What was your HBV status	Negative not seen	9	9.0
	Negative seen	86	86.0
	Positive seen	5	5.0
Is HBV vaccine necessary for you and neonates	Yes	240	77.4
	No	70	22.6
Have you ever received the HBV vaccine	Yes	100	32.3
	No	210	67.7
Reasons for no vaccinations	am aware of HBV status	62	29.5
	don't have time	2	0.95
	don't know where to go	30	14.3
	don't see the need	32	15.2
	It's expensive	84	40.0
How many doses (s) of HBV vaccine have you taken	1 dose	6	6.0
	2 doses	5	5.0
	3 doses	87	87.0
	More than 3 doses	2	2.0

What is the recommended full dose for HBV vaccination	1 dose	1	0.3
	2 doses	2	0.6
	3 doses	142	45.8
	More than 3 doses	16	5.2
	don't know	149	48.1
Do you know where you took the vaccine	Yes	127	41.0
	No	183	59.0

Table 5. Association between Hepatitis B VirusVaccination Uptake and Socio-Demographic Characteristics of Respondents

Variables	Categories	Hepatitis B Vaccination		X^2	df	P-Value
		No	Yes			
Aged-group	14-19yrs	23(7.4)	9(2.9)	11.368	4	0.023*
	20-24yrs	45(14.5)	31(10)			
	25-29yrs	51(16.5)	33(10.6)			
	30-34yrs	65(21)	15(4.8)			
	35& above	26(8.4)	12(3.9)			
Marital Status	married	194(62.6)	83(26.8)	11.332	3	0.010*
	single	8(2.6)	10(3.2)			
	cohabiting	6(1.9)	2(0.6)			
	divorce	2(0.6)	5(1.6)			
Religion	Christianity	39(12.6)	20(6.5)	0.178	2	0.915
	Islam	167(53.9)	79(25.5)			
	Traditional	4(1.3)	1(0.3)			
Ethnicity	Tampulma	93(30.0)	55(17.7)	30.380	3	<0.001**
	Gonja	35(11.3)	32(10.3)			
	Mamprusi	46(14.8)	2(0.6)			
	Others	36(11.6)	11(3.5)			
Educational Level	No education	161(51.9)	52(16.8)	33.838	3	<0.001**
	Primary	32(10.3)	14(4.5)			
	SHS	16(5.2)	31(10)			
	Tertiary	1(0.3)	3(1)			
Occupation	Farming	85(27.4)	18(5.8)	20.181	4	<0.001**
	Housewife	104(33.5)	59(19.0)			
	Trading	17(5.5)	18(5.8)			
	Professional	2(0.6)	1(0.3)			
	Others	2(0.6)	4(1.3)			
Parity	No child	27(8.7)	14(4.5)	0.913	1	0.633
	1-5	154(49.7)	76(24.5)			
	6 & over	9.4(13.2)	10(3.2)			
Gestation period	First Trimester	52(16.8)	27(8.7)	0.660	2	0.719
	Second Trimester	90(29)	38(12.3)			
	Third Trimester	68(21.9)	35(11.3)			
Antenatal visit	No	24(7.7)	1(0.3)	9.937	1	<0.001**
	Yes	186(60.0)	99(31.9)			
Tested for HBV before?	No	178(57.4)	23(7.4)	113.34	1	<0.001**
	Yes	32(10.3)	77(24.8)	4		
Distance to a health facility	Short	207(69.7)	90(30.3)	12.388	1	<0.001**
	Long	3(23.1)	10(76.9)			
Level of Knowledge	Excellent	55(17.7)	79(25.5)	80.782	2	<0.001**
	Good	54(17.4)	14(4.5)			
	Poor	101(32.6)	7(2.3)			

Chi2 p=0.05 was statistically significant. the number of Asterix p=0.2, p<0.001** shows the strength of the association. df=degree of freedom*

4. DISCUSSION

Havingade quate knowledge of a disease condition is an essential step in containing the disease. The objective of our study was to assess knowledge of HBV and vaccination uptake among pregnant women in the North Gonja District. From the study, we found out that respondents had sufficient knowledge (65%). Thus; 43% of the respondents had excellent knowledge and 22% good knowledge. However, 35% of the respondents had poor knowledge. This was consistent with two previous studies conducted in Cameroon [19,20]. The findings were however different from similar studies conducted elsewhere which reported in ade quate knowledge of HVB among pregnant women [15,21-24]. The variation in these findings might be the difference in the sample sizes, study locations and period. Specifically, we found out that more than half of the respondents had received information about HBV infection before their current pregnancy. This was similar to another study conducted in Nigeria [25]. However, this contradicts previous studies conducted among pregnant women in Kintampo in Ghana and Nairobi, Kenya where HBV information on HBV waslow among pregnant women [1,13]. The observed difference between their findings and this current study maybe as a result of the differences in study location(hospitals vis health centre/CHPS) and sample sizes. The majority of the respondents mentioned health staff as their main source of information on HBV. This however differed from a cross-sectional study conducted among pregnant women where radio was reported to be the main source of information on HBV [13]. Health staff remains the most vital agent in providing health education interventions to curb the transmission of all infections during pregnancy.

Using the demographic characteristics to evaluate the respondents' knowledge of HBV, our study revealed a significant statistical association between marital status and knowledge of HBV(p=0.001). A similar study conducted among students in Saudi Arabia also reported the same findings [26]. This significant association is explained by the fact that close to 90% of the respondents in our current study were married. The study found a significant statistical association between ethnicity and knowledge of HBV which was consistent with another study conducted among pregnant women in Malaysia [27]. At the time of our study, there was no enough literature to explain the association between Ethnicity and knowledge of HBV [26]. This finding presents an opportunity for further research in this area.We further found a significant statistical association between occupation(p=0.011) and knowledge on HBV. Which was consistent with the study conducted in Ningo-Prampram District in Ghana [28]. Just like a previous study, this study showed a significant association between ANC attendance(p<0.001) and knowledge of HBV [29]. Health talks provided by midwives during ANC visits could be a possible reason for this outcome. Similar to a study conducted in Northwest Ethiopia in 2018, our work shows strong evidence of an association between educational level(p=0.002) and knowledge of Hepatitis B [30]. This supports the fact that the education of an individual is essential in infectious disease control [31].

Vaccination is known to be effective in preventing HBV infection and complications [7,32]. The current study revealed that 85.5% of respondents saw HBV testing as necessary. However, the prevalence of HBV testing in this study was 35.2% which was higher than a similar study with the same sample size(310) conducted in Uganda where only 5.8% of the respondents have ever tested for HBV [33]. Our findings were in sharp contrast with earlier studies conducted in Cameroon and the United State of America where 90% and 87.7% of the respondents respectively have tested for HBV [34,35]. Comparison of these studies must be done with caution as the latter might have more healthcare facilities incorporating HBV testing in their routine health screenings than their counters (Ghana and Uganda).This finding was so revealing as all pregnant women in Ghana attending ANC are to be tested for HBV irrespective of whether they have ever been tested or vaccinated [11,36,37]. Steps must be put in place to ensure all pregnant women are tested for HBV just like how other routine tests are conducted by our health facilities.

On vaccination status, the percentage of respondents who have received HBV vaccine before the interview was 32.26%, significantly higher than earlier studies conducted in Gushegu in Ghana, Ibadan in Nigeria and the South-west region of Cameroon(2.5%, 9.7% and 14.6%) respectively [14,15,35]. The difference in the HBV vaccination coverage might be as a result of the study methodologies adopted in each of the studies.

In our study, 87% of those who had received the HBV vaccines, received the 3 doses as recommended by the Center for Disease Control and Prevention (CDC) [38]. For those who have never receive the HBV vaccination, 40% of them said the vaccines were expensive. This finding was in line with another study that cited logistical and financial challenges as a reason for low vaccination [37]. This calls for deliberate policy by Ghana's Ministry of Health to add HBV vaccination among pregnant women on to the EPI. Our study also showed a statistical association between the educational level of pregnant women($p<0.001$) and HBV vaccination. More of the educated respondents received HBV vaccination compared to those without education. This has reechoed the need to scaleup the educational facilities to all rural communities like current study settings. The study also shows strong evidence of a statistical association between previous HBV screening($p<0.001$),occupation($p<0.001$) of the respondents, knowledge level of respondents($p<0.001$) and HBV Vaccination uptake. This is consistent with previous studies conducted in Ibadan, Nigeria and Northwest Ethiopia [15,30].

Our findings have shown a low prevalence of HBV vaccination among pregnant women in our study setting and more actions need to be taken by both stake and non-actors to improve vaccination coverage.

5. CONCLUSION

We found that pregnant women in the North Gonja District were knowledgeable of HBV. However, HBV testing and vaccination coverage among pregnant women were low in the District.

We strongly recommend the scale-up of the routine HBV testing among pregnant to all health facilities in the district to ensure pregnant women attending ANC are tested. Vaccination of pregnant women against HBV should be introduced into the EPI by the Ministry of Health to ensure all pregnant women received the HBV vaccines to prevent perinatal transmission.

The District Health Directorate should scale-up public education on the causes, signs and symptoms, importance of HBV testing and vaccination uptake. These we believed will enhance knowledge of HBV and HBV testing and vaccination coverage in the district.

6. LIMITATIONS

Purposive sampling was used to select ten health facilities for the study, making it difficult to generalize the findings of our study. Conducting the interviews at the health facilities might have in a way influence the responses from our respondents, though confidentiality and privacy of all interviews were assured. We could not verify the claims of respondents been tested and vaccinated against HBV from the health facilities.

DEFINITION OF KEY TERMS

CHPS Compound: Refers to a designated edifice consisting of a health service delivery point and accommodation facility both of which essentially be present [39].

Health Center: it is a facility with approximately 450m2 - 600m2 in size that provides a full range of basic primary healthcare services to its clients [40].

DATA AVAILABILITY

All data are available from the corresponding author on request

CONSENT AND ETHICAL APPROVAL

Ethical approval for the study (CHRPE/AP/155/20*)* was taken from the Committee on Human Research, Publication and Ethics of Kwame Nkrumah University of Science and Technology. Permissions were also taken from the Regional, District Health Directorates and heads of various health centres before the data collection process. Respondents' participation in the study was purely voluntary. Informed consent was taken from each participant and their privacy and confidentiality were assured. Anonymous data was collected from the study respondents.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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