

Knowledge, Attitude, and Practice towards Hepatitis B Virus Among Pregnant Women Attending Antenatal Care at the Public Hospitals of Afar Regional State, Ethiopia

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Abstract

Background: Hepatitis B virus (HBV) represents a significant global health threat, especially in endemic regions such as Ethiopia, where mother-to-child transmission is prevalent. Despite the critical nature of this issue, there is research conducted on the knowledge, attitudes, and practices of pregnant women regarding HBV. This research aims to assess the Knowledge, attitudes, and practices of pregnant women attending antenatal care in public hospitals in Afar, Ethiopia, concerning HBV infection.

Method: A cross-sectional study was conducted in five public hospitals in the Afar region, Eastern Ethiopia, from August 2023 to April 2024. The study targeted 442 pregnant women attending antenatal care at public Hospitals. Data were collected through in-person interviews using a pretested structured questionnaire and analyzed using SPSS software. Associations were assessed using bivariate and multivariable logistic regressions, with a P-value of less than 0.05 considered statistically significant.

Results: Among 442 participants, 10.4% (95% CI = 7.7-13.6), 19.2% (95% CI = 15.7-23.2), and 17% (95% CI = 13.6-20.8) demonstrated good knowledge, positive attitudes, and good practices regarding HBV, respectively. Higher education (AOR=10.83, 95% CI: 3.97-29.6) was significantly linked to better knowledge, attitudes, and practices. Urban residence (AOR=2.04, 95% CI: 1.02-4.08) was associated with good knowledge and attitudes, while high income (AOR=5.16, 95% CI: 1.49-17.9) was strongly related to good knowledge. Conversely, small family size (AOR=0.428, 95% CI: 0.195-0.942) was associated with poorer practices.

Conclusion: Pregnant women in Afar exhibit low knowledge, poor practices, and negative attitudes towards HBV. Implementing comprehensive HBV screening and health education campaigns is essential to enhance this population's awareness and understanding of HBV infection.

Keywords: Knowledge, Attitude, Practice, Pregnant women, Hepatitis B virus, Afar Eastern Ethiopia.

1. Introduction

Hepatitis B virus, or HBV for short, is a deoxyribonucleic acid (DNA) virus belonging to the Hepadnaviridae family and can acutely or chronically infect people (Liang, 2009). The hepatitis B virus is 50–100 times more contagious than the human immunodeficiency virus (HIV) and the hepatitis C virus (HCV) (Chernet et al., 2017). In 2015, it was estimated that 257 million people had chronic HBV infection and 71 million had chronic HCV infection, with significant burdens in the WHO African and Western Pacific Regions (WHO, 2017). There is a lack of comprehensive national statistics in Ethiopia about the prevalence of hepatitis B infection. However, a thorough analysis indicates that the occurrence rate is 4.7% in pregnant women and 7.4% in the population (Kebede et al., 2018).

Based on research conducted in eastern Ghana in 2016, it was shown that 59.8% of pregnant women had little knowledge about HBV, 64.7% had negative attitudes, and 73.7% exhibited poor practices (Adjei et al., 2016). In contrast, a Nigerian study revealed that only 75.2% of women who get prenatal care (ANC) are not aware that Hepatitis is a viral illness that specifically targets the liver (Gboeze AJ et al., 2015). In the University of Gondar Comprehensive Specialised Hospital in Northwest Ethiopia, a study by (Gebrecherkos et al., 2020) revealed that 26.6% of pregnant women receiving antenatal care had good knowledge, while 73.4% had poor knowledge. Another study in Ethiopia (Shiferaw et al., 2016) revealed that people lack a proper understanding of viral hepatitis transmission, disease patterns, and treatment. A study conducted by (Dagneu et al., 2020) in the Amhara region of Ethiopia showed that 89.6% of pregnant women had poor knowledge of MTCT of HBV and its prevention. There is a shortage of research on pregnant Ethiopian women's knowledge, attitudes, and practices (KAP) related to HBV.

This knowledge gap severely limits the effectiveness of public health interventions and highlights the urgent need for increased educational efforts and awareness campaigns to improve understanding of HBV and its potential health implications. Despite the high prevalence of HBV, particularly in regions like Afar, no comprehensive studies have been conducted to explore KAP among pregnant women in these communities.

Understanding the KAP of pregnant women is critical for preventing HBV infection and reducing transmission rates, especially in vulnerable regions. Through targeted health education, it becomes possible to mitigate the spread of the virus and ensure better health outcomes for both mothers and their children.

Moreover, insights gained from assessing these KAPs will inform the development of immunization and prevention programs that are tailored to the specific needs of the community. Given the lack of previous research on this topic in the Afar region, this study aims to fill the gap by assessing the knowledge, attitudes, and practices of pregnant women attending antenatal care (ANC) clinics in public hospitals across the region. The findings will be vital in shaping public health strategies and ensuring that prevention efforts are both effective and sustainable.

2. Method

2.1. Study Design, Area, and Period

A cross-sectional study was conducted in five public hospitals in Afar Regional State, Ethiopia. The study focused on pregnant women receiving antenatal care between August 2023 and April 2024. The hospitals included in the survey were Dubti General Referral Hospital, Abala

Primary Hospital (Zone 2), Mohammed Aklie Memorial Hospital (Zone 3), Kelewan General Hospital (Zone 4), and Dalifage Primary Hospital (Zone 5).

2.2. Population, Sample Size, and Sampling Technique

The research used Taro Yamane's (1967) method to determine the necessary sample size, where N is the population in the selected hospitals and e is set at a 5% margin of error. The total sample size was calculated to be 442, taking into consideration a non-response rate of 10%. The sampling interval (k) was determined by dividing the total number of ANC attendance by the needed sample size: The value of k, equal to N divided by n, is calculated as 3118 divided by 442, resulting in 8. Consequently, we registered and interviewed every 8th eligible pregnant woman until we reached the desired sample size. The first participant was selected by a random lottery process, followed by the enrollment of every kth woman attending clinics until the desired sample size was achieved. Participant identification numbers were used to prevent any duplication throughout the enrollment process(figure1).

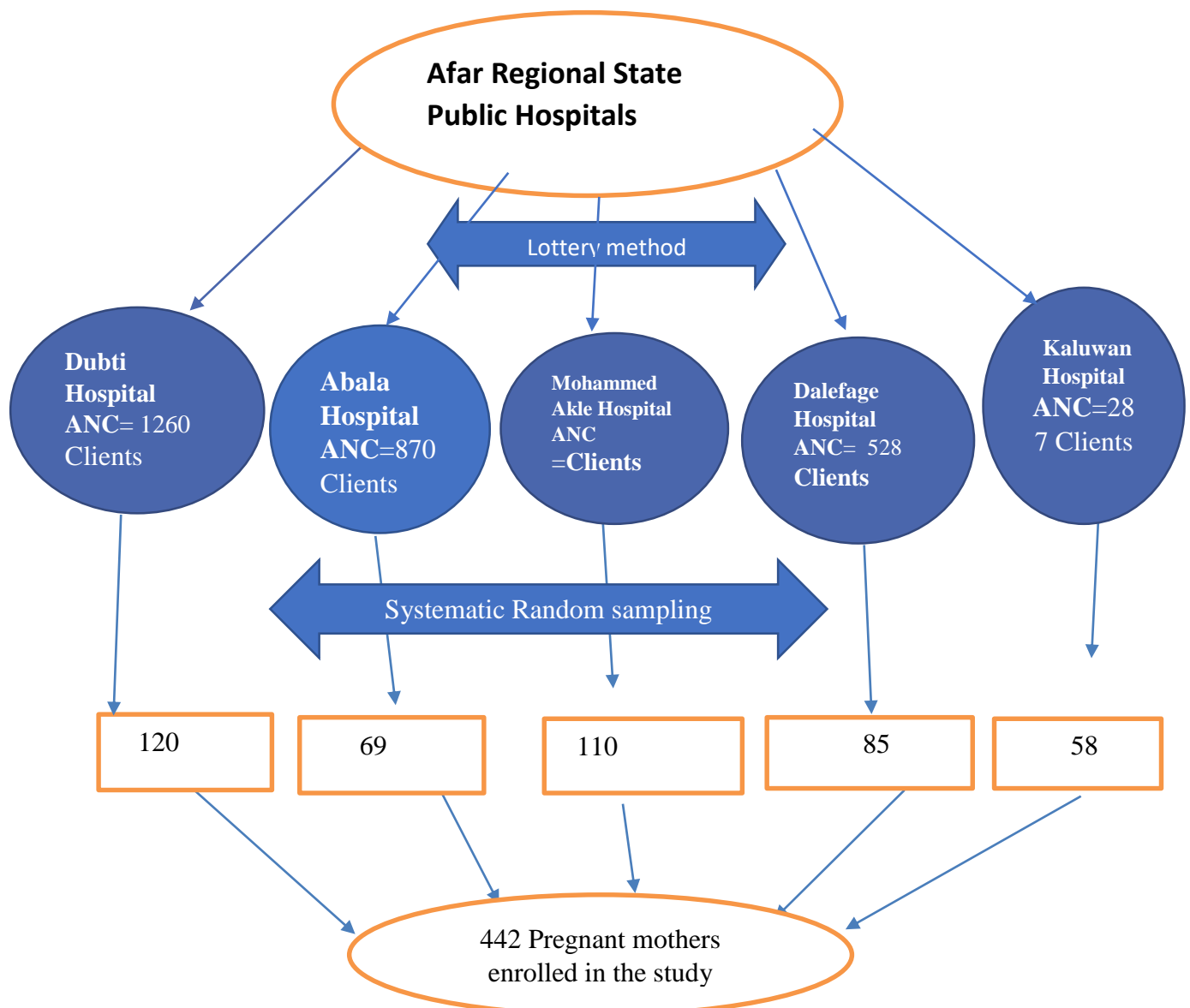


Figure 1 Schematic presentation of the sampling procedure and sampling technique for including pregnant mothers attending routine antenatal clinics in five public hospitals in the Afar region in the study, 2024.

2.3. Procedure for Collecting Data

Data Collection Tool and Technique. The study collected data on sociodemographic parameters, including age, sex, educational background, profession, residence, and income. Additionally, a pretested structured questionnaire assessed variables associated with Knowledge, Attitude, and Practice.

2.4. Data processing and analysis

Beforehand coding and inclusion into SPSS version 26, the data underwent a thorough examination to ensure completeness and consistency. After cleaning and recoding, the replies were evaluated, and scores were assigned. Each valid answer was awarded 1 point, while erroneous or missing responses earned 0 points. The knowledge assessment was conducted by posing questions about HBV's etiology, symptoms, transmission, and therapy. The scoring system ranged from 1 to 9, with scores of 4 or less indicating a lack of understanding, while scores above 4 showed satisfactory knowledge. The assessment of practices for HBV was conducted using four questions. A score of 1 was assigned to excellent practices, while a score of 0 was given to bad practices. The total score ranged from 0 to 4. Practices with scores over two were deemed suitable, while scores of 2 or below were considered poor. Attitudes were evaluated using questions categorized as positive or negative. A score of 1 was given for positive responses and a 0 for negative responses. The scoring is scaled from 0 to 9. Scores above 4 indicated a positive attitude, while 4 or below indicated a negative one.

Analyzing sociodemographic factors included using descriptive statistics, including frequencies, percentages, and graphs. Binary logistic regression was used to establish the relationships between the outcome variable and sociodemographic components. Variables with a p-value of ≤ 0.25 in the bivariate analysis were included in the multivariable model. The study used the adjusted odds ratio (AOR) along with a 95% confidence interval to account for confounding variables and accurately assess the strength of the link. The Hosmer and Lemeshow test evaluated the adequacy of the model, and variables with a p-value less than 0.05 were deemed statistically significant.

3. RESULTS

3.1. Sociodemographic characteristics

A total of 442 pregnant mothers attended ANC clinics in five selected Public Hospitals in the Afar Region; all of them participated in the study, which provided a response rate of 100%. Most mothers were young, with 39.8% aged 18-24 and 31.4% aged 25-29. There was a notable urban-rural divide, with 59.7% residing in rural areas. Islam was the predominant religion (88.0%), and the Afar ethnic group constituted the most significant portion (86.2%). Educational attainment varies widely, with nearly half (48.6%) unable to read and write. Most mothers were married (93.2%) and primarily housewives (79.9%), reflecting traditional gender roles. Income distribution highlights economic disparities, as 83.3% earn less than 500 Birr monthly (Table 1).

Table 1: Sociodemographic information among pregnant mothers attending ANC clinics in five selected Public Hospitals in Afar, Region, Ethiopia, from August 2023 to April 2024

Variable	Category	Frequency	Percentage
Age	18-24	176	39.8
	25-29	139	31.4
	30-34	74	16.7
	35-39	53	12.0
Place of residence	Urban	178	40.3
	Rural	264	59.7
Religion	Islam	389	88.0
	Christian	53	12.0
Ethnicity	Afar	381	86.2
	Amhara	34	7.7
	Others	27	6.1
Education status	Cannot read and write	215	48.6
	Can read and write	81	18.3
	Primary school	66	14.9
	Secondary school	35	7.9
	Higher education	45	10.2
Marital status	Married	412	93.2
	Others (Single, divorced, widowed)	30	6.8
Family size	1-4 Members	191	43.2
	5 -8 Members	180	40.7
	9- 12 Members	71	16.1
Occupational status	Housewife	353	79.9
	Government Employed	42	9.5
	self-employed	28	6.3
	Not Employed	19	4.3
Monthly Income	<500	368	83.3
	1000-3000	37	8.4
	>3000	37	8.4

3.2. Knowledge of hepatitis B virus among pregnant women

The research highlights substantial gaps in the knowledge of pregnant women who visit ANC clinics in the Afar Region, Ethiopia, about the Hepatitis B Virus (HBV). Most participants (78.7%) were not familiar with HBV before the study, and a significant number of them (82.8%) were not aware of its ability to lead to liver cancer or its tendency to remain asymptomatic in some people (86.2%). There were also misunderstandings about how the virus is transmitted, including a belief that it may be spread via infected instruments (87.3%) and from mother to child (93.4%). In addition, there was a lack of knowledge about the transmission of HBV via unsafe sexual practices (91.9%) and the availability of vaccines (9.5%) (Table 2).

Table 2: Knowledge towards hepatitis B virus among pregnant mothers attending ANC clinics in five selected Public Hospitals in Afar, Region, Ethiopia, from August 2023 to April 2024

Knowledge items	Response	Frequency	Percentage
Have you heard about the Hepatitis B Virus (HBV) before?	No	348	78.7
	Yes	94	21.3
Hepatitis B can cause liver cancer	No	366	82.8
	Yes	76	17.2
We can't see symptoms of Hepatitis B in some patients	No	381	86.2
	Yes	61	13.8
Hepatitis B can be transmitted by blades, ear, or nose piercings	No	386	87.3
	Yes	56	12.7
Hepatitis B can be transmitted from mother to child	No	413	93.4
	Yes	29	6.6
Can unsafe sex transmit hepatitis B	No	406	91.9
	Yes	36	8.1
Can hepatitis B transmitted through contaminated blood?	No	380	86.0
	Yes	62	14.0
Hepatitis B is curable/treatment is available	No	150	33.9
	Yes	292	66.1
Vaccination is available for Hepatitis B	No	400	90.5
	Yes	42	9.5

3.3. Attitude towards hepatitis B virus among pregnant women

The majority (97.1%) of expectant mothers who visit ANC clinics in Afar, Ethiopia, do not refrain from interacting with Hepatitis B patients, suggesting a typically inclusive mindset. Among the respondents, 9.5% believed they were susceptible to contracting Hepatitis B. However, a significant majority (92.8%) said they would actively pursue medical treatment if diagnosed with the disease, indicating a proactive approach to obtaining healthcare.

A minority of individuals (3.8%) said they had Hepatitis B. Regarding communication, most individuals (53.2%) would want to notify their parents, while 38.2% would choose to inform their spouse if they were diagnosed. Significantly, 54.5% of individuals would swiftly seek medical attention if they suspected symptoms, although opinions differed on whether to seek treatment after the beginning of symptoms.

Approximately 79.0% of the participants acknowledged a lack of clarity regarding the expenses of identifying and treating Hepatitis B. The primary concerns reported were the fear of transferring the illness (42.3%), fear of mortality (37.1%), and apprehensions about the costs of treatment (19.5%) (Table 3).

Table 3: Attitude towards hepatitis B virus among pregnant mothers attending ANC clinics in five selected Public Hospitals in Afar, Region, Ethiopia, from August 2023 to April 2024

Attitude items	Response	Frequency	Percentage
Do you avoid meeting Hepatitis B patients?	Yes	13	2.9
	No	429	97.1
Do you think you can get Hepatitis B?	Yes	42	9.5
	No	400	90.5
What would be your reaction if you found that you have Hepatitis B?	Fear	11	2.5
	Sadness	21	4.8
	Go to the health facility	410	92.8
Do you have Hepatitis B?	Yes	17	3.8
	No	425	96.2
To whom would you communicate about your illness?	Physician	33	7.5
	Parents	235	53.2
	Husband	169	38.2
	no one	5	1.1
What will you do if you think that you have symptoms of Hepatitis B?	Go to the health facility	241	54.5
	Go to traditional healers	197	44.6
	will not go anywhere	4	.9
If you had symptoms of Hepatitis B, at what stage would you go to the health facility?	As soon as I realized the symptoms	160	36.2
	After 2-4 weeks of the appearance of the symptoms	186	42.1
	When one's treatment fails	91	20.6
	Will not go to a health facility	5	1.1
How expensive do you think the diagnosis and treatment of Hepatitis B?	Cheap	9	2.0
	Free	13	2.9
	Moderately expensive	27	6.1
	Expensive	44	10.0
	I don't know	349	79.0
What worries you if you are diagnosed with Hepatitis B?	Cost of treatment	86	19.5
	Fear of transmitting the disease to family members	187	42.3
	Fear of death	164	37.1
	Discrimination by society	5	1.1

3.4. Practice towards hepatitis B virus among pregnant women

A significant proportion (96.2%) of pregnant women seeking care at ANC clinics in Afar, Ethiopia, had not been subjected to Hepatitis B screening, suggesting a poor adoption rate of this preventative intervention. Similarly, a substantial proportion (81.9%) of individuals do not ask their barber to replace blades with safe equipment while getting their ears and noses pierced, emphasizing the potential dangers of transmitting infections via hazardous procedures. A significant proportion (60.4%) expressed reluctance to pursue further examination and therapy in case of a Hepatitis B diagnosis, indicating obstacles or difficulties in obtaining healthcare services. Only 3.8% of the participants reported receiving the Hepatitis B vaccine; this highlights the need to implement better vaccination programs and provide information to increase preventative measures within this specific group (Table 4).

Table 4: Practice towards hepatitis B virus among pregnant mothers attending ANC clinics in five selected Public Hospitals in Afar, Region, Ethiopia, from August 2023 to April 2024

Practice items	Response	Frequency	Percentage
Have you done screening for Hepatitis B?	No	425	96.2
	Yes	17	3.8
Do you ask your barber to change the blade for safe equipment for ear and nose piercing?	No	362	81.9
	Yes	80	18.1
When diagnosed with Hepatitis B, would you go for further investigation and treatment?	No	267	60.4
Have you vaccinated yourself against Hepatitis B?	No	267	60.4
	Yes	175	39.6
Have you vaccinated yourself against Hepatitis B?	No	425	96.2
	Yes	17	3.8

3.5. Level of Knowledge, attitude, and practice towards hepatitis B virus

The research found that 10.4% (95%CI = 7.7-13.6) of participants had excellent knowledge of the hepatitis B virus, whereas 19.2% (95%CI = 15.7-23.2) had a positive attitude towards it, and 17% (95%CI = 13.6-20.8) had good practices related to the virus. The study's findings are graphically shown in Figure 2, which shows the distribution of participants across several categories of knowledge, attitude, and practice concerning HBV (fig 2).

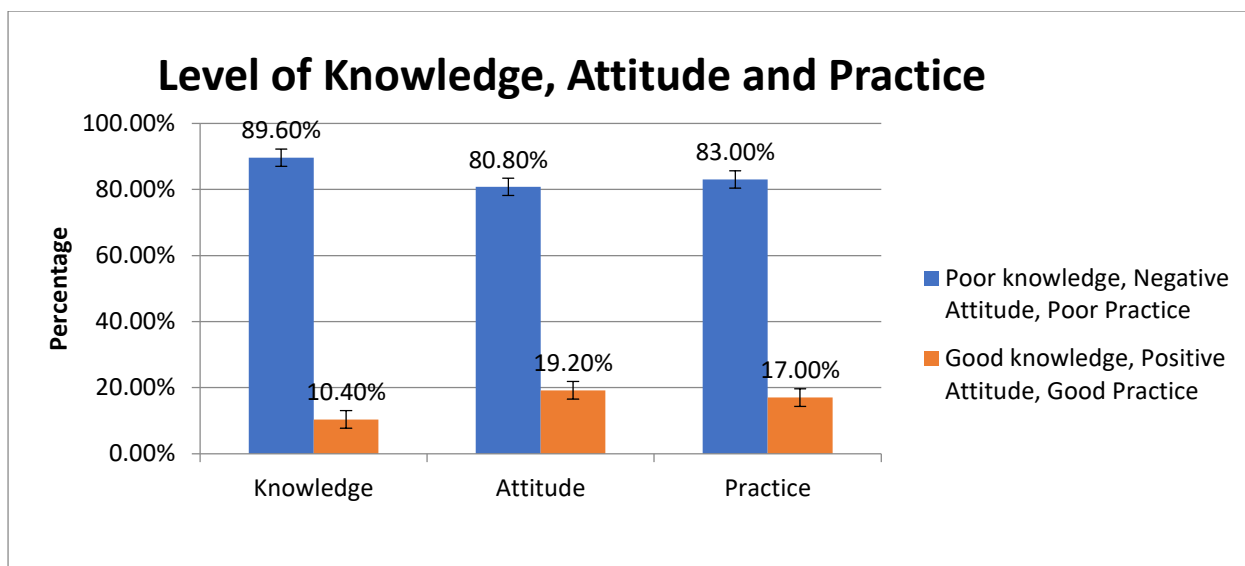


Figure 2. Level of Knowledge, Attitude, and Practice towards Hepatitis B virus among pregnant mothers attending ANC clinics in five selected Public Hospitals Afar, Region, Ethiopia, from August 2023 to April 2024

3.6. Factors associated with knowledge of hepatitis B virus infection

To determine the variables related to knowledge about hepatitis B virus infection among pregnant women who visit ANC clinics at five chosen Public Hospitals in the Afar Region, both bivariate and multivariate binary logistic regression models were used. For the bivariate analysis, only components with a p-value less than 0.25 were chosen as potential variables for the multivariable analysis. Therefore, age, place of residence, religion, educational status, marital status, family size, employment, and monthly income were chosen as potential variables for the multivariate logistic regression model.

The multivariate analysis revealed the characteristics linked with awareness about hepatitis B virus infection among pregnant women accessing ANC clinics in five chosen Public Hospitals in the Afar Region: location of residence, educational status, and monthly income.

Urban inhabitants had a 2.04 times greater likelihood of having adequate HBV knowledge than rural individuals (Adjusted Odds Ratio = 2.04, 95% Confidence Interval: 1.02-4.08, p = 0.044). The amount of education was a significant predictor, as those who finished higher education had much more knowledge regarding HBV than those with lesser education levels. Individuals with higher education showed a significantly increased likelihood of possessing strong knowledge of HBV compared to non-educators, with chances 10.83 times greater (AOR = 10.83, 95% CI: 3.97-29.6).

In addition, moms who earned more than 3000 Ethiopian Birr had a considerably greater likelihood of possessing strong knowledge compared to those who earned less than 500 Birr (Adjusted Odds Ratio = 5.16, 95% Confidence Interval: 1.49-17.9) (Table 5).

Table 5: Bivariate and Multivariate analyses of factors associated with knowledge towards hepatitis B virus infection among pregnant mothers attending ANC clinics in five selected Public Hospitals in Afar, Region, Ethiopia, from August 2023 to April 2024

Variable	Category	Knowledge		COR (95%CI)	AOR (95%CI)	P-value
		Good	Poor			
Age	18-24	13(7.4)	163(92.6)		1	
	25-29	19(13.7)	120(86.3)	1.98(.944,4.18)	2.10(.889,4.97)	.091
	30-34	6(8.1)	68(91.9)	1.11(.404,3.03)	1.51(.477,4.79)	.483
	35-39	8(15.1)	45(84.9)	2.23(.870,5.71)	1.57(.522,4.70)	.424
Place of residence (1)	Urban	26(14.6)	152(85.4)	2.08(1.13,3.87)	2.04(1.02,4.08)	.044*
	Rural	20(7.6)	244(92.4)		1	
Religion	Islam	37(9.5)	352(90.5)		.896(.325,2.47)	.832
	Christian	9(17.0)	44(83.0)	1.95(.880,4.31)	1	
Education	Cannot read and write	9(4.2)	206(95.8)		1	
	Can read and write	14(17.3)	67(82.7)	4.78(1.98,11.55)	2.26(.843,6.08)	.105
	Primary school	5(7.6)	61(92.4)	1.87(.606,5.81)	1.68(.535,5.32)	.372
	Secondary school	3(8.6)	32(91.4)	2.15(.551,8.35)	2.12(.516,8.70)	.297
	Higher Education	15(33.3)	30(66.7)	11.44(4.60,28.5)	10.83(3.97,29.6)	.000*
Marital status	Married	40(9.7)	372(90.3)	.430(.166,1.12)	.447(.140,1.42)	.172
	Others	6(20.0)	24(80.0)		1	
Family size	1-4 Members	28(14.7)	163(85.3)	2.27(.840,6.13)	1.76(.597,5.17)	.306
	5 -8 Members	13(7.2)	167(92.8)	1.03(.352,2.99)	.723(.228,2.29)	.581
	9- 12 Members	5(7.0)	66(93.0)		1	
Occupation	Housewife	30(8.5)	323(91.5)	.260(.088,.772)	.955(.243,3.75)	.947
	Government Employed	7(16.7)	35(83.3)	.560(.152,2.07)	1.25(.144,10.9)	.838
	self-employed	4(14.3)	24(85.7)	.467(.107,2.04)	.317(.058,1.72)	.182
	Not Employed	5(26.3)	14(73.7)		1	

Income	<500	31(8.4)	337(91.6)		1	
	1000-3000	6(16.2)	31(83.8)	.286(.124,.66)	2.24(.329,15.3)	.409
	>3000	9(24.3)	28(75.7)	.602(.190,1.91)	5.16(1.49,17.9)	.010*

*indicates significance at 5% level, COR: Crude odd ratio, AOR: Adjusted odd ratio, 1: reference categories, CI: Confidence interval

3.7. Factors associated with attitude towards hepatitis B virus

To determine factors associated with the attitude toward hepatitis B virus infection among pregnant women who visit ANC clinics at five chosen Public Hospitals in the Afar Region, we used bivariate and multivariate binary logistic regression models. For the bivariate analysis, only components with a p-value less than 0.25 were chosen as potential variables for the multivariable analysis. Therefore, the variables selected as candidates for the multivariate logistic regression model were place of residence, education status, marital status, family size, and occupational status.

The multivariate analysis revealed that the attitude towards hepatitis B virus infection among pregnant women visiting ANC clinics at five selected Public Hospitals in the Afar Region was influenced by characteristics such as area of residence and educational level. In Afar, Ethiopia, pregnant mothers with higher education levels were significantly more likely to have a positive attitude towards the Hepatitis B Virus (HBV). Individuals in this category had 6.01 times higher odds of a positive attitude than those with lower education levels (AOR = 6.01, 95% CI: 2.84-12.7). Furthermore, living in urban areas was shown to be correlated with more favourable views. Specifically, those residing in urban areas had a 1.69 times greater likelihood of having a positive attitude than those living in rural areas (Adjusted Odds Ratio = 1.69, 95% Confidence Interval: 1.02-2.82) (Table 6).

Table 6: Bivariate and Multivariate analyses of factors associated with attitude towards hepatitis B virus infection among pregnant mothers attending ANC clinics in five selected Public Hospitals in Afar, Region, Ethiopia, from August 2023 to April 2024

Variable	Category	Attitude		COR(95%CI)	AOR(95%CI)	P-value
		Positive	Negative			
Place of residence	Urban	44(24.7)	134(75.3)	1.79(1.12,2.88)	1.69(1.02,2.82)	.044*
	Rural	41(15.5)	223(84.5)		1	
Education status	Cannot read and write	31(14.4)	184(85.6)		1	
	Can read and write	14(17.3)	67(82.7)	1.24(.622,2.48)	1.17(.572,2.37)	.675
	Primary school	8(12.1)	58(87.9)	.819(.356,1.88)	.761(.326,1.78)	.529
	Secondary school	8(22.9)	27(77.1)	1.76(.732,4.23)	1.79(.735,4.37)	.200
	Above secondary	24(53.3)	21(46.7)	6.78(3.37,13.64)	6.01(2.84,12.7)	.000*
Marital status	Married	75(18.2)	337(81.8)	.445(.200,.99)	.455(.189,1.09)	.078
	Others	10(33.3)	20(66.7)		1	
Family size	1-4 Members	39(20.4)	152(79.6)	1.768(.808,3.87)	1.49(.660,3.37)	.336

	5 -8 Members	37(20.6)	143(79.4)	1.782(.811,3.92)	1.35(.594,3.08)	.472
	9- 12 Members	9(12.7)	62(87.3)		1	
Occupational status	Housewife	63(17.8)	290(82.2)	.815(.262,2.54)	1.37(.379,4.96)	.631
	Government Employed	7(16.7)	35(83.3)	.750(.191,2.95)	1.23(.268,5.63)	.792
	Self-employed	11(39.3)	17(60.7)	2.43(.636,9.26)	2.37(.526,10.7)	.261
	Not Employed	4(21.1)	15(78.9)		1	

*indicates significance at 5% level, COR: Crude odd ratio, AOR: Adjusted odd ratio, 1: reference categories, CI: Confidence interval

3.8. Factors associated with practice towards hepatitis B virus

Bivariate and multivariate binary logistic regression analyses were used to identify factors associated with practice towards hepatitis B virus infection among pregnant women attending ANC clinics in five selected public hospitals in the Afar Region. In the bivariate analysis, factors with a p-value < 0.25 were selected as candidate variables for the multivariable analysis. Accordingly, ethnicity, education status, family size, occupational status, and knowledge were selected as a multivariate logistic regression model candidate variable.

The result of multivariate analysis showed that family size and educational status were identified as factors associated with practice towards hepatitis B virus infection among pregnant women attending ANC clinics in five selected Public Hospitals in the Afar Region.

Education level emerged as a significant predictor, with individuals who had completed higher education demonstrating 2.95 times higher odds of practising good behaviours towards HBV than those with lower education levels (AOR = 2.95, 95% CI: 1.28-6.81). Additionally, family size also showed significance, where mothers from smaller families (1-4 members) had 57.2% lower odds of practising good behaviours towards HBV (AOR = 0.428, 95% CI: 0.195-0.942) compared to those from more prominent families (9-12 members). (Table 7).

Table 7: Bivariate and Multivariate analyses of factors associated with practice towards hepatitis B virus infection among pregnant mothers attending ANC clinics in five selected Public Hospitals in Afar, Region, Ethiopia, from August 2023 to April 2024

Variable	Category	Practice		COR (95%CI)	AOR(95%CI)	P-value
		Good	Poor			
Ethnicity	Afar	61(16.0)	320(84.0)		1	
	Amhara	6(17.6)	28(82.4)	1.124(.447,2.83)	1.29(.457,3.69)	.621
	Others	8(29.6)	19(70.4)	2.209(.925,5.28)	2.13(.824,5.49)	.119
Education status	Cannot read and write	27(12.6)	188(87.4)		1	
	Can read and write	11(13.6)	70(86.4)	1.094(.515,2.33)	.901(.397,2.05)	.804
	Primary school	13(19.7)	53(80.3)	1.708(.824,3.54)	2.08(.972,4.45)	.059

	Secondary school	8(22.9)	27(77.1)	2.063(.851,5.01)	2.12(.830,5.41)	.116
	Above secondary	16(35.6)	29(64.4)	3.84(1.848,7.99)	2.95(1.28,6.81)	.011*
Family size	1-4 Members	23(12.0)	168(88.0)	.557(.269,1.16)	.428(.195,.942)	.035*
	5 -8 Members	38(21.1)	142(78.9)	1.09(.549,2.17)	.880(.425,1.82)	.731
	9- 12 Members	14(19.7)	57(80.3)		1	
Occupational status	Housewife	46(13.0)	307(87.0)	.562(.179,1.77)	.616(.183,2.07)	.434
	Government Employed	13(31.0)	29(69.0)	1.68(.466,6.06)	2.01(.519,7.79)	.312
	self-employed	12(42.9)	16(57.1)	2.82(.742,10.67)	2.89(.707,11.8)	.140
	Not Employed	4(21.1)	15(78.9)		1	
Knowledge	Poor knowledge	63(15.9)	333(84.1)		1	
	Good knowledge	12(26.1)	34(73.9)	1.86(.916,3.79)	1.48(.649,3.37)	.351

*indicates significance at 5% level, COR: Crude odd ratio, AOR: Adjusted odd ratio, 1: reference categories, CI: Confidence interval

4. Discussion

The current study aimed to assess pregnant women's knowledge, attitudes, and practices regarding hepatitis B (HBV) infection among those who visit ANC clinics at five selected public hospitals in the Afar Region. The results showed that 10.4% of people had adequate knowledge regarding HBV infection. The findings of this research were consistent with those of a previous study conducted in the Amhara area of Ethiopia (Dagneu et al., 2020), as well as a cross-sectional study conducted in northern Vietnam (Hang et al., 2019), and Cameron (Frambo et al., 2014). However, the outcome was inferior to those obtained from the prior investigations in Gondar, Ethiopia (Gebrecherkos et al., 2020). In addition, a cross-sectional research in China in 2017 (Han et al., 2017). 2017, a study was conducted in Ghan (Dun-Dery et al., 2017). The wide range of differences highlights the need for focused educational efforts to improve public knowledge of HBV transmission, symptoms, prevention (including vaccination), and treatment choices.

Our results revealed significant variation in the respondents' knowledge of HBV transmission methods. More precisely, a minor 12.7% of individuals were knowledgeable of the transmission of Hepatitis by blades used for ear or nose piercings. In comparison, only 8.1% were aware of its transmission through risky sexual practices. Additionally, only 6.6% knew that Hepatitis may be passed from mother to child during pregnancy, and 14% were aware of its transmission through contaminated blood. The current study is consistent with a study done in Gondar, Ethiopia (Gebrecherkos et al., 2020) and Cameroon (Frambo et al., 2014). Lack of understanding may lead to missed opportunities for timely vaccination and medical

interventions to prevent the transmission of HBV from mother to child, thereby resulting in a higher prevalence of HBV infection among newborns. Due to the limited knowledge about how HBV is transmitted, it is crucial to provide targeted health education. In contrast, a study carried out in Nigeria in 2015 found that pregnant women showed adequate comprehension of the transmission of HBV from mother to child (Gboeze AJ et al., 2015). A study conducted by Pham et al. in Vietnam in 2019 revealed that pregnant women knew about the transmission of HBV via unprotected sexual intercourse (Hang et al., 2019).

Based on our findings, knowledge of HBV transmission methods varied significantly among respondents: only 12.7% recognized that Hepatitis can be transmitted through blades used for ear or nose piercings, 8.1% through unsafe sexual practices, 6.6% from mother to child during pregnancy, and 14% through contaminated blood.

This research aligns with a study in Gondar, Ethiopia (Gebrecherkos et al., 2020) and Cameroon (Frambo et al., 2014). This lack of comprehension may result in lost chances for prompt vaccination and medical measures to prevent the transfer of HBV from mother to child, possibly leading to increased incidence of HBV infection among babies. Given the limited understanding of HBV transmission methods, it is necessary to provide focused health education.

In contrast to this study, the results of research conducted in Nigeria in 2015 (Gboeze AJ et al., 2015) and a study done by Pham et al. in Vietnam in 2019 (Hang et al., 2019). Showed pregnant women had a sufficient understanding of how HBV is transmitted from mother to child. The substantial knowledge levels seen among pregnant women in these varied environments indicate that routine prenatal care educational initiatives on hepatitis B infection have had positive outcomes.

According to this research, the majority of pregnant women (82.8%) who went to ANC clinics had a mistaken belief that the hepatitis B virus (HBV) did not lead to liver cancer. Only a small percentage (17.2%) accurately understood the connection between HBV and liver cancer. The findings were consistent with research conducted in Japan in 2013 (Eguchi & Wada, 2013). Nevertheless, the outcome was inferior to the findings of research conducted in Pakistan in 2012 (Ul Haq et al., 2012). It is important to note that this misunderstanding highlights a significant gap in knowledge regarding the long-term health risks associated with HBV infection among the individuals who participated in the research.

Based on this study, 19.2% of the individuals involved had a positive attitude towards HBV. The findings of this study were lower compared to the results of previous studies conducted in Sudan (Mursy et al., 2019), Gondar Comprehensive Specialized Hospital (Gebrecherkos et al., 2020), and Guangdong Province in China (Han et al., 2017). The potential cause for the decreased positive attitudes towards HBV among the participants of the study could be attributed to insufficient awareness campaigns, cultural stigma, and difficulties in accessing healthcare and infrastructure.

Additionally, this study revealed that 17% of the participants demonstrated good practices concerning hepatitis B (HBV) infection. This finding is comparable to the study conducted in Gondar, Ethiopia (Gebrecherkos et al., 2020). On the contrary, a study conducted in China in 2017 by (Han et al., 2017) demonstrated good practices concerning hepatitis B (HBV) infection.

The discrepancy can be explained by factors such as limited healthcare access, insufficient awareness about vaccine availability, lack of understanding about the importance of HBV screening for prevention and control, and differing levels of education among participants. The results of this study indicated that individuals who attained higher levels of education exhibited a greater chance of possessing good knowledge, maintaining a positive attitude, and engaging in good behaviours towards HBV compared to those with lower levels of education. The results were in line with the research conducted in Ethiopia (Dagneu et al., 2020) and Saudi Arabia ((Al-Shamiri et al., 2018), which emphasized that higher education is associated with greater awareness and proactive health behaviours related to HBV. The correlation can be ascribed to the broader availability of health information, the ability to think critically, and the socioeconomic benefits of higher education. These factors collectively promote informed decision-making and proactive health-seeking behaviours.

The present study demonstrates that urban residents have a greater chance of acquiring good knowledge and positive attitudes towards hepatitis B (HBV) than rural residents. This study is supported by a study conducted in Ghana (Nsiah et al., 2020) and studies conducted by (Chen et al., 2019). One possible explanation is that urban environments have more healthcare infrastructure and services, allowing for increased access to health information through clinics, health campaigns, and media.

The study's findings indicate that mothers from smaller families (1-4 members) had a reduced likelihood of engaging in positive practice towards the hepatitis B virus (HBV) compared to those with larger family sizes. This finding is consistent with previous research conducted in Ghana and China (Dun-Dery et al., 2017); (Nsiah et al., 2020). One of the possible explanations for this phenomenon is that larger families tend to engage in more in-depth conversations and provide more encouragement regarding health-related decisions and practices than smaller families do.

5. Conclusion and recommendation

The study discovered that the participants' attitudes towards the hepatitis B virus (HBV) were negative, their practices were poor, and their knowledge of the virus was poor. It was discovered that pregnant women with greater levels of education and those who reside in metropolitan areas were more likely to have positive attitudes and good knowledge about HBV. On the other hand, people who came from smaller households were less likely to take adequate precautions against HBV. These findings emphasize the urgent necessity for focused interventions aimed at enhancing pregnant women's awareness and availability of HBV treatment. Developing comprehensive health education programs for pregnant women to address these disparities is crucial. These programs should prioritize educating women about the significance of preventing, transmitting, and treating HBV. Regular antenatal care (ANC) check-ups should incorporate standard HBV screening to promptly identify and manage the infection. These programs can promote healthier behaviours and enhance the outcomes for both mothers and babies by distributing information and providing useful guidance.

Author contributions

All authors played significant roles in various aspects of the research. The first author was actively involved in multiple phases, including the conception of the study, its design, execution, data acquisition, analysis, and interpretation. The second author served as a guide and advisor throughout the research process, providing essential input and support.

Both authors contributed equally to drafting, revising, and critically reviewing the manuscript to ensure the quality and integrity of the work. They jointly provided final approval for the version to be published, agreed on the choice of journal for submission, and committed to being accountable for all aspects of the research, ensuring its accuracy and reliability.

Acknowledgments

We gratefully acknowledge Andhra University and the Afar Regional State Health Bureau for granting ethical clearance for this study. Our gratitude extends to the administrations of the five public hospitals for their cooperation. We also extend our sincere thanks to the study participants and all individuals who contributed to the successful completion of this research.

Ethical Statement

The research involving human participants was reviewed and approved by both Andhra University, India, and the Afar Regional State Health Bureau, Ethiopia. All participants provided their written informed consent to take part in this study.

Conflict of Interest

The authors state that the research was carried out without commercial or financial connections that might be perceived as potential conflicts of interest.

Funding Statement

This research on the " Knowledge, Attitude, and Practice towards Hepatitis B Virus Among Pregnant Women Attending Antenatal Care at the Public Hospitals of Afar Regional State, Ethiopia", received no financial support or funding.

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