UMEÅ UNIVERSITY

DETERMINING PREVALENCE OF HEPATITIS BS AG INFECTION AND ASSOCIATED RISK FACTORS AMONG PREGNANT WOMEN AND THEIR KNOWLEDGE ATTITUDES AND PRACTICES TOWARDS HB INFECTION, HARGEISA CITY, SOMALILAND 2018.

A research paper

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ACRONYMS

HBV	Hepatitis B virus
HB	Hepatitis B
KAP	Knowledge attitudes and practices
WHO	World Health Organization

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ABSTRACT

Background: Hepatitis B (HB) is a viral infection that affects liver and may act as a tumor promoter. It is a global public health problem which is transmissible from one individual to another by several means including; through blood, mother to child, unprotected sexual intercourse, sharing of eating utensils and other barber shop and beauty salon equipment and shared teeth brush. In Somaliland there is a paucity of information about prevalence of Hepatitis b virus, its risk factors, knowledge, attitude and practice (KAP) among population including pregnant women who are at higher risk to the infection. **Objective:** The general objective of this study is to determine the prevalence and associated factors of HB and level of knowledge, attitudes and practices about HB among pregnant women. **Methods:** A cross-sectional study was conducted to determine, prevalence, risk factors and the level of KAP among 228 pregnant attending selected heath centers for receiving antenatal care services. Demographic characteristics, risk factors and KAP variables were evaluated using a standardized structured questionnaire. Finger blood sample was taken to determine HBs Ag sero-prevalence using SD BIOLINE device. Percentages and descriptive statistics for demographic characteristics, risk factors and mean scores for knowledge, attitude and practice among pregnant respondents were used. Kruskal Wallis test was used to determine association between variables and Spearman's rho correlation were used to establish correlation between KAP mean scores. **Results:** The sero-prevalence of HBs Ag among pregnant women was 5.8%, mean scores for KAP were 10.71 ± 4.75, 3.94 ±1.28 and 4.39 ± 2.55 correspondingly. The Knowledge and practice mean scores were associated with educational level ($p < 0.05$), marital status ($p < 0.05$), Antenatal care visits was correlated with KAP mean scores ($p<0.05$). The study also found that there was a significant association between KAP mean scores, *Knowledge – Attitudes* ($r = 0.225$, $p < 0.05$), *Knowledge – Practice* ($r = 0.571$, $p < 0.05$), *Attitude – Practice* ($r = 0.249$, $p<0.05$). **Conclusions:** The study reflected a prevalence of 5.7% and sub-optimal KAP mean scores towards HB infection among study subjects necessitating development of relevant policies and public health programs to address this important public health problem.

Keywords: *Hepatitis b, Knowledge, attitude, practice, KAP, Hb risk factors, pregnant woman*

CHAPTER ONE: BACKGROUND AND PROBLEM STATEMENT

1.1. Background

Hepatitis B was first discovered in 1965 in the serum of Australians, the epidemiologists known as Australian antigen, the vial particle was discovered in 1970 and in 1980s the sequencing of the viral genome and first testing of the hepatitis B vaccine. Globally Hepatitis B virus infection is considered as a major public health problem and around 30% of global population's serological tests show positivity of either current or past infection, Christian T, Henry L Y Chan and Anna Lok (2014). Studies show that about 40% of men and 15% of women who with acquired hepatitis B virus infection during prenatal period die of either liver cirrhosis or hepatocellular carcinoma, Christian Trépo, Henry L Y Chan and Anna Lok (2014). Ugo Fedeli, Enrico Grande, Francesco Grippo, and Luisa Frova (2017) estimates for the prevalence of HCV infection range from < 1.0% in Northern Europe to > 2.9% in Northern Africa, with the highest prevalence (15%-20%) reported from Egypt.

Hepatitis B is considered one of the major public health problems in developing countries Christian T, Henry L Y Chan and Anna Lok (2014). WHO (2016) hepatitis B and Hepatitis C Viruses are the commonest causes of chronic liver disease in several regions of the world. The worldwide carrier rate of HBV is more than 350 million, these are carriers providing a huge reservoir for HBV and over 2 billion individuals alive today has infected at some point in their lives WHO (2016). Marc Ringehan, Jane A. McKeating and Ulrike Protzer (2017), hepatitis B (HB) can cause both acute and chronic infections that can lead to liver cirrhosis and hepatocellular carcinoma (HCC) causing a mortality of more than 1.3 million deaths per year. HB accounts for about 90% of all primary liver cancer cases. WHO (2016) estimated indicate that hepatitis-related mortality is highest (≥33.50 deaths per 100 000 population per year).

Globally HBV infection is ranked 15 among all caused of mortality. In 2010, the total death caused by HBV was 786,000 deaths, with majority of them attributable to liver cancer (341,000 deaths) and cirrhosis (312,000 deaths) Jennifer H, Mac Lachlan and Benjamin C Cowie (2015).

HBV can transmit through exposure to infected blood and bodily fluids especially; semen and vaginal secretions, there are no strong and reliable evidence showing that it ca n be transmitted through saliva, tears, breast milk, sweat, and urine. Unlike some other viruses, it can survive

outside the body for a long period. Routes of transmission include perinatal transmission at birth, through sexual contact, through injecting drug use, contaminated blood and blood products and through medical practices. The latter being significant vehicle in both resource-poor and well-resourced settings Jennifer H, Mac Lachlan and Benjamin C Cowie (2015).

Lucifora J, Protzer U (2016) and Seeger C, Mason WS (2015), hepatitis B infection is caused by hepatitis b virus which a DNA virus belonging to a family is called Hepadnaviridae which can cause acute or chronic infection. Structurally, HBV, partially double-stranded DNA virus replicates via reverse transcription. It is characterized by its narrow host range and tissue tropism to replicate in hepatocytes. HBV persists in the nucleus of infected hepatocytes. The viral genome has four overlapping open reading frames encoding the structural core (HBc) and envelope proteins, the viral polymerase/reverse transcriptase and regulatory X protein (HBx), which is regarded as an oncoprotein. Three envelope proteins of different sizes (small (S), medium (M) and large (L)) are encoded by the same open reading frame with M and L carrying N-terminal extensions.

In Somaliland there were no prior studies done in hepatitis B infection Data from the Health Management Information Systems Department (HMIS) showed higher prevalence rates of hepatitis Bs Ag among the men who donated blood voluntarily. The overall purpose of this study is to evaluate prevalence, risk factors and KAP among pregnant women in Somaliland.

1.2. Problem statement

In Somaliland, although the rate of the transmission seems high, and the number of people who have the infection is increasing, no scientific research is done up to now. In 1980s, KM Bile (1987) and his teams conducted in some areas of Somalia. Worldwide, an estimated two billion people have been infected with the hepatitis B virus and more than 240 million have chronic (long-term) liver infections. Generally, Africa a high HBV endemicity > 8% of hepatitis B surface antigen (HBsAg) including countries like Nigeria, Namibia, Gabon, Cameroon, Burkina Faso. Some countries such as Kenya, Zambia, The Ivory Coast, Liberia, Sierra Leone and Senegal are considered areas of intermediate endemicity (2%-8%), and Egypt, Tunisia, Algeria and Morocco as a low endemicity level (< 2%) Rosa Zampino, Adriana Boemio, Caterina Sagnelli, et al (2015). A study conducted in Somali communities in Liverpool on prevalence of HBs Ag and anti-HBc shows 5.7% and 27.5% respectively and the significant risk factors are receiving an injection in Somalia (RR 2.1, 1.7-2.5 CI). The study also showed that the history of circumcision or other surgical procedure in Somalia (RR 1.4, 1.3-1.6 CI) and being born in Somalia (RR 1.3, 1.2-1.4 CI), Aweis D, et al (2001). Although, there are prior studies conducted by the Ministry of Health or other organizations working in the field, Somaliland can be considered as country with intermediate endemicity for HBV. In addition, health institutions and professional associations in Somaliland are not research oriented. Somaliland can be considered as country with intermediate endemicity for HBV. HBV vaccine for infants is available in majority of the health centers, but vaccination of HBV for adults is available in only some private clinics in the country. There is significant and positive linear correlations between knowledge-attitude, knowledge-practice and attitude-practice, other factors as residence area are associated with mean KAP of the study respondents Noman ul Haq, Mohamed Azmi Hassali and Asrul Akmal Shafie et al (2012). Hence this study explores the magnitude of HBV among pregnant women, its associated factors and knowledge, attitudes and practices towards HB infection. The results of this study will provide strategic guidance to the decision makers to be able design appropriate and effective strategies and intervention to mothers, babies and health workers as well as general population. The results from this study will also offer information to health professionals, academicians and researchers locally, regionally and globally.

1.3. Justification of the study

Study of Hepatitis B virus is a high infective and t is known to have a public health importance and high mortality and long term consequences as a result of its complications such as liver cirrhosis and hepatocellular carcinoma. Globally, it is estimated that more than 350 million people are chronic HBV carriers which is about 5 to 10% of infected individuals. Approximately 1 in 4 of them develop chronic hepatitis or cirrhosis and may develop hepatocellular carcinoma late in their life. In Somalia there is a limited information about the magnitude of HB infection among community, their KAP levels and associated risk factors. Hence there is a need for a study to be conducted to estimate the prevalence of HB infection and determine the KAP and risk factors among pregnant mothers receiving antenatal services. In addition this study determines prevalence, risk factors and KAP simultaneously. The results of this study will be useful for policy makers in developing intervention, strategies and policies to prevent the mothers, new-borns and health providers including midwives from developing HB infection and reducing disease sequelea once infected

1.4. Objectives of the study

a. General Objective of the Study

Determining HBV prevalence, its associated risk factors among pregnant women as well as their knowledge, attitudes and practices in selected maternal and child health care centers in Hargeisa, Somaliland 2017 -2018

b. Specific Objectives of the Study

1. To estimate the prevalence of Hepatitis B Virus among pregnant women
2. To determine risk factors associated with HBV infection
3. To explore the knowledge, attitudes and practices among pregnant women toward HBV infection

CHAPTER TWO: LITERATURE REVIEW

2.1. Epidemiology of Hepatitis B

Epidemiologically, hepatitis B was first discovered in 1965 in the serum of Australians, the epidemiologists known as Australian antigen, the vial particle was discovered in 1970 and in 1980s the sequencing of the viral genome and first testing of the hepatitis B vaccine. Globally Hepatitis B virus infection is considered as a major public health problem and around 30% of global population's serological tests show positivity of either current or past infection, Christian T, Henry L Y Chan and Anna Lok (2014). According to the carrier state among population, countries are classified high endemicity (≥ 8%), intermediate endemicity (2-7%), or low HB endemicity (< 2 %) Jennifer H, Mac Lachlan and Benjamin C Cowie (2015). There strong evidences indicating high endemicity of HB in Africa and Asia. According WHO regions, prevalence of HB ranges from 0.20% to 13.55% in Americas and 0.48% to 22.38% in the African region. The sero-prevalence of HBs Ag is 3.61% worldwide with African region has the highest endemicity 8.83% and 5.26% for the Western Pacific region Aparna Schweitzer et al (2015). According to data from the neighboring countries of Kenya and Ethiopia by Aparna Schweitzer et al (2015), the prevalence estimates are 5.16% and 6.03% respectively**.** A systematic review conducted in Iran reported an overall prevalence of HBV of 3% (95% CI 2% to 3%) by Mohammadi Z Keshtkar A Eghtesad S and Jeddian A et al (2016). Another study conducted in Ethiopia by Zelalem Desalegn, Adane Mihret and Habtamu Bedimo et al (2016) yielded a prevalence of 5.4% where the majority of the pregnant women were in the age group 25-29 years. Another study presented that prevalence of HBV infection among pregnant women was 6.9%, Umare A, Seyoum B, Gobena T and Haile Mariyam T (2016).

A research work done by Jacqueline Asundula Malungu Ngaira, James Kimotho and Isaac Mirig et al (2016) showed high infection among pregnant women with highest rate 3.8% seen in the age group 20-24. In addition, respondents with tertiary education (Mean =1.33, SD = 1.131), were more knowledgeable about HBV infection than those with primary and secondary education (Mean = 0.63, SD = 0.722; (Mean =0.31, SD= 0.664) respectively. Other significant risk factors were type of family ($p<0.01$), parity ($p<0.01$), history of abortions ($p<0.01$) and early age (11-15 years) at first sexual encounter ($p<0.01$).

HBs Ag was detected more often in pregnant women with multiple exposure factors (8.8%, n=13) than in pregnant women who had not experienced possible risk factors (4%, n=1). This difference was not statistically significant (OR, 2.33; 95%CI, 0.29 to 18.63), Jacqueline Asundula Malungu Ngaira, James Kimotho and Isaac Mirig et al (2016).

Several studies in some parts of Nigeria estimated the prevalence of HB among pregnant women. Sero-prevalence among pregnant was 6.6%, BT Utoo (2013), 3.9% by Aba HO, Aminu M (2016), 4.3% by Akani CI, Ojule AC and Opurum HC, et al (2005). The Osogbo city in Nigeria showed high prevalence of 16.5% of HBS Ag among pregnant women, Kolawole OM, Abideen A Wahab and Daniel A Adekanle, et al (2012). Prevalence of HBs Ag among antenatal attendees was 7.0%, Nongo BH, Agida TE, Oghenebuk U, Yunusa T (2016). These variations in prevalence can be attributed to geographical variations and to the methodology used to some extent. In Iran about 1.56% of pregnant women were HBs Ag positive, Hasan Afzali, Mansooreh Momen Heravi and Seyyed Alireza Moravveji, et al (2015). Another study in Iran by Alireza Shoghli, Seyed Mahmood Nabavi and Seyed Moayed Alavian et al (2014) showed very close results of about 1.2% among pregnant women. In Ghana, the prevalence of HBV among pregnant women is 2.4%, Arnold Luuse, Sylvester Dassah, and Sylvester Lokpo, et al (2016).

2.2. Knowledge of Hepatitis B

Recently many scholars and researchers have focused on KAP in HB infection as well as on the directionality and correlation between KAP and risk factors of HB infection.

The Knowledge of HB is generally low among communities in rural areas where awareness and level of education is relatively lower, Abongwa, L., Sunjo, N., & Afah, N. (2016). The study also showed that the knowledge mean score towards HB was 14.4 out of 28 points. Several studies study in some African countries tries including the neighboring countries showed that the level of HB knowledge among pregnant women is significant low. Evidence suggest that vertical transmission of HB infection is more common in Asia than in Africa. Study conducted in China by Han et al 2017 indicated that majority of pregnant women 53.3% did not aware of that HBV can spread through unprotected sexual contact and approximately 20% of the study subjects did not know that HBV transmit from mother to baby. A study conduced in some parts of Ghana showed 41% pregnant were aware of hepatitis B viral infection, Martha Ali Abdulai, Frank

Baiden, George Adjei, and Seth Owusu-Agyei (2016) and about 33.5% of the study subjects correctly stated the transmission routes of Hepatitis B. A study conducted by Han Z, Yin Y, Zhang Y, et al. (2017) indicated that the mean score of knowledge was 6.73 ± 3.04 (mean ± SD). Most of the respondents 53.3% did not know that HBV could spread through unprotected sexual contact and about 20% did not know that HBV could transmit from mother to infant. About 54.5% were aware of that HBV could cause cancer and almost 23% of women were knowledgeable on how HBV could transmit. Among those who were knowledgeable, 54.9% of pregnant women knew that HBV can spread from mother to child, and 47.5% said it could transmit through unprotected sex, Anita Cheng, JoAnn Jose and Roderick Larsen (2015).

Regarding the correlation between KAP scores, attitudes scores weakly showed poor association with knowledge scores (correlation 0.352, $P<0.001$), Han Z, Yin Y, Zhang Y, Ehrhardt S, Thio CL, Nelson KE, et al. (2017). A study KAP of HBV among Medical and Health Science Students Showed a significant positive linear correlations between knowledge-practice ($r=0.173$, $p=0.002$) with a mean scores of knowledge11.52 ± 2.37 and practice 2.76 ± 1.1, Yonatan Moges Mesfin and Kelemu Tilahun Kibret (2013). Nagah Mohamed Abo El-Fetoh, Rehab Thaib Rawian Alenzi and Khaled Mahmoud Ghabban, et al (2017), indicated moderate and significant correlation between knowledge and attitude towards hepatitis B infection ($r=0.544$) and weak significant correlations between knowledge and practice ($r=0.170$) and attitude and practice ($r=0.199$). Another study found that there were no significant associations between knowledge, attitudes and practices among healthcare workers Machiya and Tichaona (2011).

A study on knowledge about HBV infection conducted in China showed poor score, the mean score was 6.73 ± 3.04 (mean ± SD). The higher education level was significantly correlated with better knowledge and attitude score correlation 0.33, $P<0.001$) and attitudes scores were weakly correlated with knowledge scores (correlation 0.352, $P<0.001$), Zhenyan Han, Yuzhu Yin and Yuan Zhang, et al (2017).

2.3. Attitudes towards Hepatitis B

The attitudes mean score of rural communities in Cameron was 4.7 out of 8 points. Han et al 2017 concluded that 83% were willing to screen themselves for HB and 85% of them had their children vaccinated against HBV.

2.4. Practices of Hepatitis B

Population in Africa as shown by studies have relatively poor practices, in a study by Abongwa, L., Sunjo, N., & Afah, N. (2016), approximately 75.7% of the general population had poor

practices and only 24.3% had good practices with mean score of 3.8 ranged between 2 and 7. In terms of screening, only (20.6%) have screened for HBV and (2.3%) were vaccinated against HBV, and (91.2%) ask for a new syringe or sharps objects before use Han et al (2017).

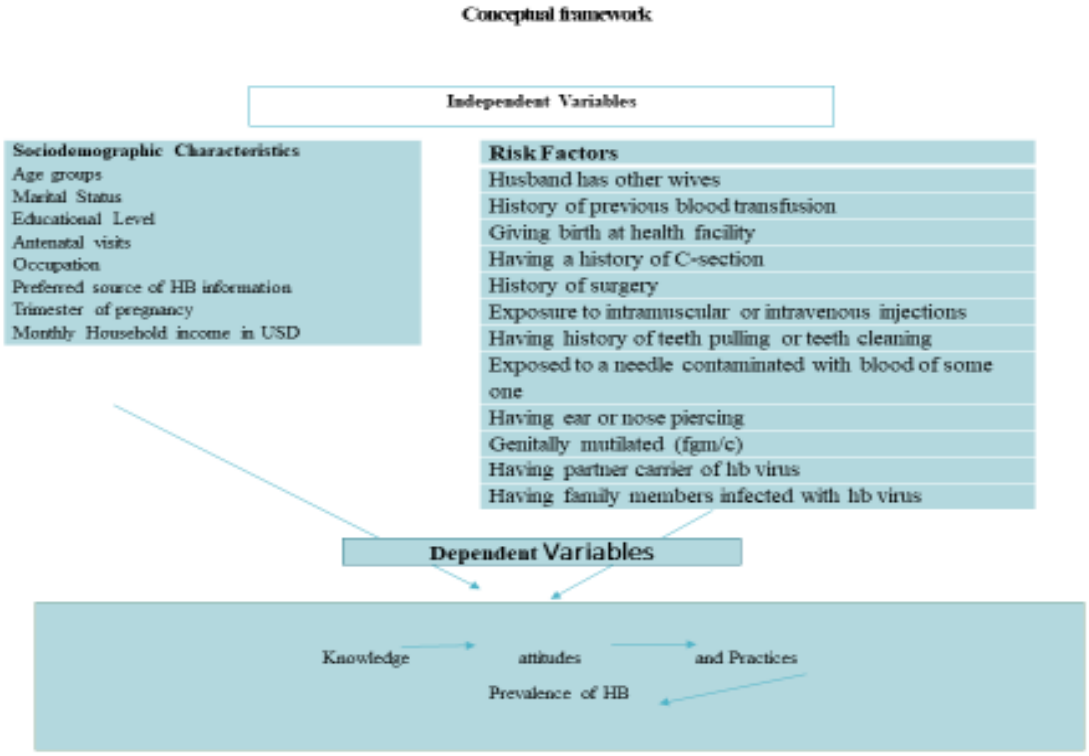
2.5. Factors associated with HBV and KAP

Han et al (2017), higher education level was associated with better knowledge and attitude scores. Martha Ali Abdulai, Frank Baiden, George Adjei, and Seth Owusu-Agyei (2016), level of education (OR=4.2, P<00.1) and occupation (OR= 3.8, P00.1 were the significant predictors for Hepatitis B awareness. History of abortion (OR: 6, P-value 0.017), surgery (OR: 5, P-value: 0.045) and family history for hepatitis (OR: 11, P-value: 0.014) were associated with sera-positivity of HBV Zelalem Desalegn, Adane Mihret and Habtamu Bedimo et al (2016). Similarly, a study conducted in Ethiopia showed several predicators for HB infection among pregnant women. These include history of abortion (OR 10.9; 95% CI: 2.2–53.9), nose piercing (OR 9.1; 95% CI: 1.34–61.79), surgical procedure (OR 12.8; 95% CI: 1.68–97.06) and history of multiple sexual partners (OR 16.8; 95% CI: 3.18–89.06), Umare A, Seyoum B, Gobena T and Haile Mariyam T (2016).

2.6. Source of information

Martha Ali Abdulai, Frank Baiden, George Adjei, and Seth Owusu-Agyei (2016), with regard to the source of information of HBV radio was the most common about (42%) and places of worship were the least stated sources of information (2.7%). Han et al (2017), 15.6% from Media, 39.9% of the study subjects reported they participated in either seminar or attended a conversation about HBV, 40.2% got the information from a health facility 32.4% from friends or relative.

2.7. Conceptual framework



CHAPTER THREE: METHODOLOGY

3.1. Study design

Quantitative cross-sectional study

3.2. Place of Study

The study was conducted in Somaliland, a not recognized self declared autonomous state. The study was undertaken in four health centers in Hargeisa City, namely, Dr Khalid, New Hargeisa, Guryasamo and Sahardid health centers. Pregnant women attending for the selected health centers for antenatal care purposes were included in the study.

3.3. Study population

The study population is all pregnant women who seeking antenatal care at the selected public health facilities in Hargeisa city.

3.4. Inclusion criteria and exclusion criteria

Any pregnant woman attending the selected HFs for antenatal care purposes who had not been vaccinated against hepatitis B and does aware of her hepatitis B status during data collection. Any pregnant woman attending at the HFs who got vaccinated against hepatitis B virus or know that she is positive (had previously tested positive)

3.5. Sampling method

Convenient sampling technique was employed in this study. All the mothers who attending in the four Health facilitates during the collection period were approached and consented, data collection was stopped once the required sample Size reached. Sampling method was chosen as the listing of the mothers visiting health facilities during study period was not possible.

3.6. Sample size calculation

$$N = \frac{z^2 P(1-P)}{e^2}$$

Level of Confidence = Z = 1.96, Margin of Error (e^2) = 0.05, P = prevalence obtained prior study

1-p = 1 minus the prevalence. The sample was adjusted expected non-response rate of 10%. The sample size was 230.

3.7. Data collection instruments

a. Questionnaire

Pretested structured questionnaire were administered to the respondents to capture information on socio -demographic, risk factors and KAP by professional nurse and lab technician after having received a clear explanation of the objective of the study and having a signed informed consent from the respondents. The tool was comprised of three parts, part one was Socio-demographic characteristics, part two risk factors and part three was KAP. The knowledge scale was consisted of 20 items, attitudes were measured using 7 items and 7 items scale for practice. In addition, a blood sample was drawn from each study subject.

b. Blood sample

In addition, a blood sample was drawn from each study subject. All blood specimens was screened using HBV detection kit. The instructions of the kit producer was followed. A rapid one step Hepatitis B surface Ag SD BIOLINE device was used. Whole blood specimens was collected and used for the detection. SD BIOLINE has a sensitivity and specificity of 100%. The test procedure was based on transferring 20 ul of whole blood into the Test region in the device, adding four drops of diluent and waiting for 20 min incubation period**.** A red line in the Test region indicated that HBs Ag was positive. All blood specimens was screened using HBV detection kit. The instructions of the kit producer was followed. A rapid one step Hepatitis B surface Ag SD BIOLINE device was used. Whole blood specimens was collected and used for the detection. SD BIOLINE has a sensitivity and specificity of 100% (WHO Evaluation report, 2003).The test procedure was based on transferring 20 ul of whole blood into the Test region in the device, adding four drops of diluent and waiting for 20 min incubation period**.** A red line in the Test region indicated that HBs Ag was positive.

3.8. Ethical considerations

Ethical Approval was received from MOH and Informed consent was obtained from the study subjects before data collection and blood sampling were carried out. Study participants were told that they have the right to quit the study any time they decided and that data is confidential and it will be used only for the study.

3.9. Data processing and analyses

After an informed consent was obtained from the participants using a consent form the study subjects were interviewed, a pretested and validated questionnaire. Then a Laboratory technician took blood samples from participants. all questions in the questionnaire were coded before instruments were printed out and codes were using during data collection.

Data was entered using SPSS version 22 and frequency tests were applied too check errors on daily basis. frequency tests were applied too check errors on daily basis.

3.10. Data analysis plan

Data analysis was done using SPSS version 22. Descriptive statistical tests were used to describe the data. Proportions and frequencies were used for categorical variables and mean, mode and standard deviation were used for numerical data. Q - Q plot , box and whisker plots, skewness and kurtosis, histogram and Shapiro- Wilk‘s test (p. value < 0.05) were used to test normality distribution of KAP.

Kruskal–Wallis H was used for comparing KAP mean scores among socio-demographic characteristics and risk factors among participants. Spearman's rho correlation was used to test associations between KAP variables. In addition, to measure the KAP status among respondents a cut-off points were set for each variable. The cut-off point score for knowledge was >12 for adequate and ≤ 12 for poor knowledge about hepatitis B infection. For attitudes, more than 4 was considered as positive attitude and ≤ 4 as negative attitude and practice a score of > 5 as good practice and score of ≤ 5 as poor practice. SPSS software version 22 was used for data entry, coding and analysis.

CHAPTER FOUR: RESULTS

4.1. Socio-demographic characteristics

A total of 230 pregnant women were enrolled to participate in the study with a response rate of (99%). The sero – prevalence of HBs Ag among respondents was 5.8%. The average age of study participates was (27 ± Sd 5.5) ranging between 17 and 44 years. Majority of the study participate were between age groups (21 -26 years) 43%, (27 – 32 year) (28%), (33 – 38 years) (14%). Younger and older age groups represented (12%) (15 – 20 years) and (39-44 year) (3%) respectively. Marital status of study participate were reported as (85%) married, (11%) divorced and (4%) widowed. Majority of the study participates were illiterate (46.5%), (43.9%) completed some or all primary level and (9.6%) completed some secondary and above education level. Almost half of the pregnant women had two antenatal care visit during current pregnancy (50.4%) followed by one antenatal visit (39.9%) and (9.6%) had three antenatal visits. About (65.4%) reported currently not work, (25%) housewives, and (9.6%) reported being employee or having a job. The greater proportion of study participants were in the second trimester (54.4%) during this antenatal visit, followed by first trimester (30.3%) and third trimester (15.4%). A greater number of respondents (90%) indicated health centers as their preferred sources of Hepatitis B information. Television was the least potential source of information (10%). Table one below illustrates the demographic characteristics of the study participants.

Table 1: **Characteristics of study subjects**

Table 1: Characteristics of study subjects

Age groups	N	%
15 – 20 years	27	11.8
21 – 26 years	97	42.5
27 – 32 years	64	28.1
33 – 38 years	33	14.5
39 – 44 years	7	3.1
Marital Status		
Married	194	85.1
Divorced	24	10.5
Widowed	10	4.4
Educational Level		
Illiterate	106	46.5
Primary	100	43.9
Secondary	22	9.6
Antenatal visits		
ANC 1	91	39.9
ANC 2	115	50.4
ANC 3	22	9.6
Occupation		
Does not Work	57	25.0
Housewife	149	65.4
Work	22	9.6
Preferred source of HB information		
Television	22	9.6
Health Centers / MCH	206	90.4
Trimester of pregnancy		
1st trimester	69	30.3
2nd trimester	124	54.4
3rd trimester	35	15.4
Monthly Household income in USD		
Minimum	**Maximum**	**Average**
$ 50	$ 300	$184.5 ± $51.1 SD

Table 2: **Distribution of risk factors among respondents**

Table 2: Distribution of risk factors among respondents

Risk factors	Yes (%)	No (%)
Husband has other wives	53 (23.2%)	175 (78.8%
History of previous blood transfusion	8 (3.5%)	220 (96.6%)
Giving birth at health Facility	196 (86.0%)	32 (14.0%)
Having a C-section	7 (3.1%)	221 (96.9%)
History of surgery	2 (0.9%)	226 (99.1%)
Exposure to intramuscular or intravenous injections	59 (25.9%)	169 (74.1%)
Having history of teeth pulling or teeth cleaning	21 (9.2%)	207 (90.8)
Exposed to a needle contaminated with blood of some one	100 (100%)	0.0 (0.0%)
Having ear or nose piercing	225 (98.7%)	3 (1.3%)
Genitally mutilated (FGM/c)	220 (96.5%)	8 (3.5%)
Having partner carrier of Hb virus	228 (100%)	0.0(0.0%)
Having family members infected with Hb virus	7 (3.1%)	221(96.9%)

4.2. Knowledge towards hepatitis B among respondents

Of the 228 participants, 66% had poor knowledge and 34% had adequate knowledge. The mean knowledge score of participants was 10.71 ± 4.75. As described in table 2 below, about 43% and 36% study subjects knew about Hepatitis B infection and Hepatitis B virus respectively. Approximately 34% of respondents knew that HB infection can affect liver and 75% knew the infection is lifelong. Majority of the respondents 76% showed that HB can affect any age group and 83% knew that it is transmitted through contaminated instruments. Two third (68%) of study participants correctly identified symptoms such as; nausea, vomiting and loss of appetites and about 39.5% knew that HB can be asymptomatic. Around 53% of the respondents correctly identified that HB can be transmitted by an un-sterilized syringe needle and surgical instruments, 36% through blood transfusion, 45% through blades of a barber and ear and nose pierces, 48.7% from mother to child and 72.8% through unsafe sex.

However, a great proportion of pregnant women had misconception about HB infection and virus. 62.7% of participants believed that HB can be transmitted through sharing food and water with a

Hepatitis B infected person. A large proportion of participants, 79% believed that HB can be treated and 35% believed it can be self-cured. Around 71% believed that HB requires special diet for treatment. A low proportion of respondents, 21.5% knew about the HB vaccine and its availability. Only 7% of study participants knew about the availability of the HB vaccine in Somaliland, indicating that pregnant women in Somaliland had poor knowledge about vaccine availability.

Table 3: **Percentages of Hepatitis B Knowledge items**

Table 2: Percentages of Hepatitis B Knowledge items

Items	Yes n (%)	No n (%)
1. Have you heard of a disease termed as Hepatitis B?	99 (43.4%	129 (56.6%)
2. Is hepatitis B a viral disease?	82 (36%)	146 (64%
3. Can hepatitis B affect liver function?	78 (34.2%)	150 (65.8%)
4. Will an infected person remain infected for life?	170 (74.6%)	58 (25.4%)
5. Can hepatitis B affect any age group?	174 (76.3%)	54 (23.7%)
6. Can Hepatitis B virus be transmitted by contaminated needles, sharp objects, and tattoo instruments?	189 (82.9%)	82.9 (17.1%)
7. Are nausea, vomiting & loss of appetite common symptom of hepatitis B?	156 (68.4%)	72 (31.6%)
8. There are no symptoms of the Hepatitis B in some of the patients	90 (39.5%)	138 (60.5%)
9. Can Hepatitis B transmitted by un-sterilized syringe needle & surgical instrument?	121 (53.1%)	107 (46.9)
10. Can Hepatitis B transmitted by contaminated Blood & blood product	82 (36%)	146 (64%)
11. Can Hepatitis B transmitted by blades of the barber /ear & nose pierces?	102 (44.7%)	126 (55.3%)
12. Can Hepatitis B transmitted from person without symptoms	102 (44.7%)	126 (55.3%)
13. Can Hepatitis B transmitted by mother to child?	111 (48.7%)	117 (51.3%)
14. Can Hepatitis B transmitted by unsafe sex?	166 (72.8%)	62 (27.2%)
15. Can Hepatitis B virus be transmitted by sharing food and water with a Hepatitis B infected person?	143 (62.7%)	85 (37.3%)
16. Is Hepatitis B curable / treatable?	181 (79.4%)	47 (20.6%)
17. Can Hepatitis B self- cured by body?	80 (35.1%	148 (64.9%)
18. Is vaccination available for Hepatitis B?	49 (21.5%)	179 (78.5%)
19. Is specific diet required for treatment of Hepatitis B?	164 (71.8%)	64 (28.1)
20. Is Hepatitis B vaccine available in Somaliland?	16 (7%)	212 (93%)

Knowledge was measured by giving 0 t0 the wrong answer and 1 to the correct answer. The scale ranged from minimum o to maximum 20 points. Scores > 12 were taken as adequate, ≤ 12 as poor knowledge of HB.

4.3. Attitudes towards Hepatitis B among respondents

Findings from this study indicate that a small proportion of study subjects 39.5% had a positive attitude towards hepatitis B infection with a mean score of 3.94 ±1.28. Generally, all participants believed that they could be infected at any time in their life. A great proportion, 79% of study subjects had an attitude of fear towards Hepatitis B. When asked, who they preferred to talk to about HB, majority of participants 61% reveled that they would talk to a physician or health care worker. Roughly about 75% preferred to visit health facility when they feel HB like symptoms. This indicates a positive attitude towards HB infection among respondents, a crucial step in infection prevention in the community. Majority of the study subjects 58.8% stated that they would go to health facility as soon as they realize the symptoms of Hepatitis B. In terms of HB testing and treatment costs, approximately, 67.5% of study subjects expressed that hepatitis B is expensive, the 228 pregnant women who participated in the study, about 46.5% indicated fear of disease spreading among family.

Table 4: **Attitude towards Hepatitis B**

Table 4: Attitude towards Hepatitis B

Attitude items	N %
1. Do you think you can get Hepatitis B virus?	
Yes *	228 (100%)
No	0 (0.0%)
2. What would be your reaction if you found that you have Hepatitis B?	
Fear*	179 (78.5%)
Surprise	13 (5.7%)
Sadness	36 (15.8%)
3. Who would you talk to about your illness?	
Husband	65 (28.5%)
Parents	24 (10.5%)
Physician / Health provider*	139 (61%)
4. What will you do if you think that you have symptoms of Hepatitis B?	
Go to Physician*	172 (75.4%)
Go to Health Facility	56 (24.6%)
5. If you had symptoms of Hepatitis B, at what stage you will go to the health facility?	
Soon I realize the symptoms are of Hepatitis B*	134 (58.8%)
When own treatment fails	25 (11%)
After 3-4 weeks of the appearance of symptoms	69 (30.2%)
6. How expensive do you think is the diagnosis and treatment of Hepatitis B?	
Expensive*	154 (67.5%)
Do not Know	10 (4.4%)
Somewhat expensive	54 (23.7%)
Reasonable	10 (4.4%)
7. What worries you will most have if you will be diagnosed with Hepatitis B?	
Nothing worried	112 (49.1%)
Fear of disease spread to family*	106 (46.5%)
Fear of Death	10 (4.4%)

*****Indicates positive attitude

Attitude was assessed by giving 1 to positive and 0 to negative attitude. The scale ranges from minimum 0 and to maximum 7. More than 4 was considered as positive attitude and ≤ 4 is classified as negative attitude.

4.4. Practice towards Hepatitis B among respondents

Approximately, 46.5% of the total pregnant women respondents had a good practice towards hepatitis B infection with a practice mean score of 4.39 ± 2.55. A great proportion 42.5% of participants had blood test screening for hepatitis B. Of study respondents, 47.8% indicated that

they prefer avoiding the use of shared toilets with infected individuals. About 54% of study subjects stated that they would share food with infected person. A great number of participants 51.8% reported that they would ask for a blood screening and new syringe before blood transfusion. 46.9% said that they would ask a barber to change the blade and use sterile equipment for nose and ear piercing. About 71.9% indicated that they are happy socializing with HB infected individuals and only small portion 30% had participated in health education programs related to hepatitis B infection.

Table 5: Practice towards Hepatitis B

Table 5: Practice towards Hepatitis B

Practice items	Yes n %	No n %
1. Have you done screening for Hepatitis B?	97 (42.5%	131 (57.5%)
2. Would you avoid sharing the toilet with Hepatitis B infected person?	109 (47.8%)	119 (52.2%)
3. Would you share food with a Hepatitis B infected person?	123 (53.9%)	105 (46.1%)
4. Do you ask for new syringe and screening of blood before transfusion?	118 (51.8%)	110 (4.8.2%)
5. Do you ask your barber to change blade/or for safe equipment for ear and nose piercing?	107 (46.9%)	121 (53.1%)
6. In case you are diagnosed with Hepatitis B, would you go for further investigation and treatment?	214 (93.9%)	14 (6.1)
7. Do you avoid meeting Hepatitis with B patients?	164 (71.9%)	64 (28.1%)
8. Have you ever participated in health education program related to Hepatitis B?	69 (30.3%)	159 (69.7%)

*Practice was calculate by giving 1 to positive attitude and 0 to negative attitude. The scale ranges from minimum of zero and maximum of 8. The scale measures practice consider a score >5 as good practice and score ≤5 as poor practice.

Table 5 below compared the socio-demographic characteristics of the respondents and KAP mean scores, normality tests such as Q - Q and box and whisker plots, skewness and kurtosis, histogram and Shapiro- Wilk‘s test (p. value < 0.05) showed that normality assumption was violated. Kruskal–Wallis H test was used for comparing KAP mean scores among socio-demographic characteristics of study subjects. The only significant factors associated with KAP were marital status, educational status, antenatal care visits, and source of HB information and trimester of pregnancy.

Table 6: Correlation between Socio-demographic characteristics and mean KAP scores

Table 6: Correlation between Socio-demographic characteristics and mean KAP scores

Variable	N	Knowledge Score (M ±SD)	P-value	Attitude Score (M±SD)	P-value	Practice Score (M±SD)	P-value
Age groups							
15 – 20 years	27	11.44 ± 4.74		3.96 ± 1.09		4.70 ± 2.74	
21 – 26 years	97	10.33 ± 4.73		3.96 ± 1.2		4.25 ± 2.47	
27 – 32 years	64	11.20 ± 4.53		4.14 ± 0.94		4.45 ± 2.67	
33 – 38 years	33	10.42 ± 5.17		3.73 ± 1.17		4.51 ± 2.43	
39 – 44 years	7	10.0 ± 5.53		3.71 ± 1.38		3.85 ± 2.79	
Marital Status							
Married	194	11.04 ± 4.83	0.0001	3.93 ± 1.17	0.258	4.53 ± 2.53	0.002
Divorced	24	9.87 ± 4.01		4.45 ± 0.72		4.04 ± 2.47	
Widowed	10	6.20 ± 0.63		3.60 ± 0.51		2.50 ± 2.46	
Educational Level							
Illiterate	106	10.24 ± 4.58	0.000	3.89 ± 1.30	0.000	4.33 ± 2.44	0.322
Primary	100	10.75 ± 4.79		3.99 ± 0.98		4.09 ± 2.66	
Secondary	22	12.77 ± 5.02		4.27 ± 0.70		6.00 ± 1.97	
Antenatal visits							
ANC 1	91	10.86 ± 5.56		4.37 ± 0.98		4.52 ± 2.38	
ANC 2	115	10.24 ± 4.81	0.044	3.72 ± 1.15	0.0001	4.05 ± 2.63	0.006
ANC 3	22	12.50 ± 1.09		3.63 ± 1.09		5.59 ± 2.50	
Occupation							
Does not Work	57	11.54 ± 4.85		4.61 ±0.95		4.49 ± 2.55	
Housewife	149	10.08 ± 4.56		3.68 ± 1.12		4.11 ± 2.55	
Work	22	12.77 ± 5.02		4.27 ± 0.70		6.00 ± 1.97	
Preferred source of HB information							
Television	22	8.04 ± 3.79		4.13 ± 0.77		3.04 ± 2.47	
Health Centers / MCH	206	10.99 ± 4.76	0.001	3.99 ± 1.15	0.639	4.53 ± 2.52	0.006
Trimester of pregnancy							
1st trimester	69	11.07 ± 4.63		4.44 ± 0.99		4.50 ± 2.41	
2nd trimester	124	10.51 ± 4.63	0.550	3.91 ± 0.97	0.559	4.23 ± 2.64	0.000
3rd trimester	35	10.68 ± 5.43		3.22 ± 1.41		4.71 ± 2.64	

The table 6 below demonstrates the means cores of the KAP variables, the knowledge was measured using a scale comprised of 20 questions. The knowledge mean score among pregnant respondents was 10.71 ± 4.75 sd which is below the cut –off –point of 12. Poor knowledge towards Hb infection among respondents accounted for 66% as depicted by figure 1. Attitudes scale was be composed of 7 questions, the mean score was 3.94 ±1.28 SD which is below the average cut-

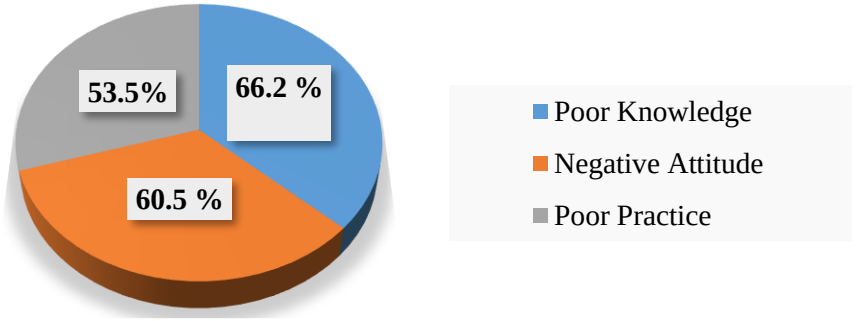
off point of 4. Furthermore, about 61% of pregnant women had negative attitudes towards Hb infection. Similarly, the mean score of practice was poor 4.39 ± 2.55 SD. The practice scale was consist of 8 questions with a cut-off point of 5. Approximately, 53.5% of study subjects revealed that they had poor practice towards Hb infection.

Table 7: Overall KAP mean score of the study subjects

Table 7: Overall KAP mean score of the study subjects

Variable	**Mean Score ± sd**	**Cut –off -point**
Knowledge	10.71 ± 4.75	12
Attitudes	3.94 ±1.28	4
Practice	4.39 ± 2.55	5

Figure 1: Percentage of poor knowledge, negative attitude and poor practice



As presented in Table 7 below, there is significant statistical association between KAP variables. Spearman's rho test was employed to determine correlation between KAP mean scores. Determination strength of correlation was based on Cohen's criteria (0-0.25) = weak correlation, (0.25-0.5) = fair correlation, (0.5-0.75) = good correlation and > (0.75) = excellent correlation (Cohen 1988).[1] knowledge – attitude and attitude - practice showed fair correlation r = 0.225 (p. value 0.001) and r = 0.249 (p. value 0.0001) respectively. However, knowledge – practice revealed good correlation r = 0.571(0.0005). In terms of directionality, the results of the study presented that knowledge has a positive influence on attitude resulting in an increased good practice among respondents.

Table 8: Association between KAP Mean Scores

Table 8: Association between KAP Mean Scores

Variables	Spearman's rho correlation coefficient	P .Value
Knowledge - Attitudes	0.225	0.001
Knowledge - Practice	0.571	0.0005
Attitude – Practice	0.249	0.0001

CHAPTER FIVE: DISCUSSIONS

The results of this study presented HBs Ag prevalence of 5.8% among pregnant women seeking antenatal care at certain health centers in Hargeisa city of Somaliland. This findings are in agreement with a study conducted in Somali communities in Liverpool with a prevalence of HBs Ag of 5.7%, Aweis D, et al (2001), indicating that Somaliland has an intermediate endemicity of HB virus similar to many African countries such Ethiopia that has a prevalence of less than. Zelalem Desalegn, Adane Mihret and Habtamu Bedimo et al (2016) yielded a prevalence of 5.4% and Umare A, Seyoum B, Gobena T and Haile Mariyam T (2016) a prevalence of 6.9%.

In line with several studies, our study presented poor knowledge attitudes and practices (KAP) mean scores among the respondents, the study highlighted poor knowledge about 66% with a mean score of 10.71 ± 4.75 SD that is below the average cut –off point of 12. Han Z, Yin Y, Zhang Y, et al. (2017) indicated that the mean score of knowledge was 6.73 ± 3.04 (mean ± SD). A study conduced in some parts of Ghana showed 41% pregnant were aware of hepatitis B viral infection, Martha Ali Abdulai, Frank Baiden, George Adjei, and Seth Owusu-Agyei (2016).

Overall, in our study, about 66% of pregnant mothers had poor knowledge towards HB infection. The mean score of attitude scale was 3.94 ±1.28 SD, just below the average cut-off point of 4 and about 61% of pregnant women had negative attitudes towards HB infection. Results also showed that the mean score of practice was poor 4.39 ± 2.55 SD that is blow the cut-off point of 5 in practice scale and approximately, 53.5% of study subjects revealed that they had poor practice towards HB infection.

Knowledge –attitude and attitude - practice showed fair correlation r = 0.225 (p. value 0.001) and r = 0.249 (p. value 0.0001) respectively. However, knowledge – practice revealed good correlation r = 0.571(0.0005). In terms of directionality, the results of the study presented that knowledge has a positive influence on attitude resulting in an increased good practice among respondents. Regarding the correlation between KAP scores, attitudes scores showed week correlation and significant association with knowledge scores (correlation 0.352, $P<0.001$), Han Z, Yin Y, Zhang Y, et al. (2017). Nagah Mohamed Abo El-Fetoh, Rehab Thaib Rawian Alenzi and Khaled Mahmoud Ghabban, et al (2017), indicated moderate and significant correlation between knowledge and attitude towards hepatitis B infection (r=0.544) and weak significant correlations between knowledge and practice (r=0.170) and attitude and practice (r=0.199).

Other study targeted health professionals showed significant positive linear correlations between knowledge-practice (r=0.173, p=0.002) with a mean scores of knowledge11.52 ± 2.37 and practice 2.76 ± 1.1, Yonatan Moges Mesfin and Kelemu Tilahun Kibret (2013). Another study on general populations in Pakistan also showed poor KAP among study population. Attitudes mean scores were blew (3.94 ±1.28 SD the cut –off point of 4 indicating poor attitude towards HB infection, Ul-Haq N, Hassali MA and Shafie AA, et al (2012).

The results also presented that about 49% of mothers were aware of that HB infection can transmit from mother to the baby. This result is just below that of Han et al 2017 who indicated that majority of pregnant women 53.3% did not aware of that HBV can spread through unprotected sexual contact and approximately 20% of the study subjects did not know that HBV transmit from mother to baby. Generally, fear to a disease is considered as positive attitude to disease prevention and control, in this study, approximately 67.5% perceived HB testing and treatment as expensive, which is a good sign of preventing the high cost consequences of HBV. This result is inconsistent with a study conducted by Baig VN, Gupta PK and Sharma AK, et al (2015). were about only 20% of the respondents expressed HB treatment and investigation as expensive. Regarding the knowledge of preventive measures, only 21% were aware of the existence of HB vaccine for adults and only 7% knew that this vaccine is available in Somaliland.

CHAPTER SIX: CONCLUSION, RECOMMENDATIONS AND LIMITATION OF THE STUDY

6.1. Conclusion

Our study revealed a prevalence of 5.7% and generally, poor KAP mean scores among respondents and variations in risk factor distribution among respondents. The only significant factors associated with KAP were marital status, educational status, antenatal care visits, and source of HB information and trimester of pregnancy. The poor knowledge and inadequate attitudes and practices in the transmission and prevention of the disease, calls attention the risk to which the newborn and birth attendants are is exposed.

6.2. Recommendation

This study recommends development of policies and public health programs focusing on increased awareness and behavioral change among pregnant women attending health centers to receive antenatal care services as well as other high-risk groups in the population including newborn and health care providers. Based on our findings, it is suggested that governmental efforts should be carried out to raise the awareness on methods of transmission, prevention and self-protection at all points of care including MCHs and Hospitals. The study also recommends that awareness on HB infections should be integrated into the ongoing health primary health education and awareness activities and campaigns through media channels and at health facilities. It is also recommended that post intervention studies should be conducted to make sure that the right information regarding control and prevention of transmission have reached and influenced the target population. To introduce the HB diagnosis and vaccination in all health facilities for free or at affordable prices for mothers, infants, birth attendants and other health professionals.

6.3. Limitations of the study

The study design is cross sectional study, which limits the generalizability of the results to whole population as well as attributing specific factors the burden and spread of the disease. Other limitations included the relatively small sample size and due to inadequate financial resources, we

changed the sampling method to non-probability sampling which is another limitation for generalizability of the results. Therefore, we are suggesting a careful interpretation of the result. Future studies should be directed towards other study designs to better determine causations and risk factors of HB among diverse population segments.

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ANNEXES

Annex 1: Informed consent

Informed consent:

I am _____ from Faculty of Medicine, University of Hargeisa; I am conducting a research on hepatitis B infection among pregnant women.

The objectives of the study: is to determine the prevalence of Hepatitis Bs Ag and its associated factors, knowledge, attitudes and practices among pregnant as a means of preventing child from infection. I am kindly asking you to participate in this very important study. Firstly you will be administered a questionnaire to fill out, and then a blood sample will drown to test the HB infection. This information will be kept confidentially and only will be used for study purposes. The result of the test will be given to you on the spot after 20 minutes. If you agree to participate you can just sign this consent form.

Signature:_____

Informed consent (Somali version)

Magacayga waa_____ ka socda kuliyada caafimadka, Jaamacada hargeisa , waxanu samayneynaa daraaso ku saabsan joonis cadka iyo khatara ku xeeran, aqoonta , iyo waxa laga aminsanyhan, oo aanu ka baadheyno hooyada uurka leh. Si sharaf iyo xushamad leh waxaan kaaga codsaneynaa in aad nagala qayb qayb qaadato, xogta aad bixineyso cid kele oo ogaan karto ma jirto waana sir. Marka hore sualo ayaad naga qayb qaadaneysaa, marka labaadna dhiig ayaan kaa qaadeynaa si aan u baadhno. Jawaabta dhiiga waxan kugu siineynaa mudo 20 daqiiqo ah. Hadii aad raali ka tahay , noo saxeex foomkan adoo mahadsan.

SAXEEXA_____

Annex 2: Questionnaire

DETERMINING PREVALENCE OF HEPATITIS BS AG INFECTION AND ASSOCIATED RISK FACTORS AMONG PREGNANT WOMEN AND THEIR KNOWLEDGE ATTITUDES AND PRACTICES TOWARDS HB INFECTION, HARGEISA CITY, SOMALILAND 2018

Part 1: Sociodemographic Factors

Age groups: 15 – 20 years ()21 – 26 years()27 – 32 years()33 – 38 years()39 – 44 years()
Marital Status: Married () Divorced () Widowed ()
Educational Level: Illiterate ()Primary () Secondary ()
Antenatal visits : ANC 1 () ANC 2 () ANC 3 () ANC 4 ()
Occupation: Does not Work ( ) Housewife ( ) Work ( )
Preferred source of HB information: Television ( ) Radios ( ) Health Centers / MCH ( ) friends and families ( ) others ( )
Trimester of pregnancy: 1st trimester ( ) 2nd trimester ( ) 3rd trimester ( )
Monthly Household income in USD _____

Part 2: Risk factors among respondents

For each of the question below, please put a tick (□) on the appropriate response according to your own knowledge. All questions/statements are compulsory.

RISK FACTOR	Yes	No	Don't Know
Husband has other wives	( )	( )	( )
History of previous blood transfusion	( )	( )	( )
Giving birth at health Facility	( )	( )	( )
Having a C-section	( )	( )	( )
History of surgery	( )	( )	( )
Exposure to intramuscular or intravenous injections	( )	( )	( )
Having history of teeth pulling or teeth cleaning	( )	( )	( )
Exposed to a needle contaminated with blood of some one	( )	( )	( )
Having ear or nose piercing	( )	( )	( )
Genitally mutilated (FGM/c)	( )	( )	( )
Having partner carrier of HB virus	( )	( )	( )
Having family members infected with Hb virus	( )	( )	( )

Part 3: knowledge towards HBV

Item	Yes	No	Don't know	No	No
21. Have you heard of a disease termed as Hepatitis B?	( )	( )	( )		
22. Is hepatitis B a viral disease?	( )	( )	( )		
23. Can hepatitis B affect liver function?	( )	( )	( )		
24. Will an infected person remain infected for life?	( )	( )	( )		

25. Can hepatitis B affect any age group?	( )	( )	( )
26. Can Hepatitis B virus be transmitted by contaminated needles, sharp objects, and tattoo instruments?	( )	( )	( )
27. Are nausea, vomiting & loss of appetite common symptom of hepatitis B?	( )	( )	( )
28. There are no symptoms of the Hepatitis B in some of the patients	( )	( )	( )
29. Can Hepatitis B transmitted by un-sterilized syringe needle & surgical instrument?	( )	( )	( )
30. Can Hepatitis B transmitted by contaminated Blood & blood product	( )	( )	( )
31. Can Hepatitis B transmitted by blades of the barber /ear & nose pierces?	( )	( )	( )
32. Can Hepatitis B transmitted from person without symptoms	( )	( )	( )
33. Can Hepatitis B transmitted by mother to child?	( )	( )	( )
34. Can Hepatitis B transmitted by unsafe sex?	( )	( )	( )
35. Can Hepatitis B virus be transmitted by sharing food and water with a Hepatitis B infected person?	( )	( )	( )
36. Is Hepatitis B curable / treatable?	( )	( )	( )
37. Can Hepatitis B self- cured by body?	( )	( )	( )
38. Is vaccination available for Hepatitis B?	( )	( )	( )
39. Is specific diet required for treatment of Hepatitis B?	( )	( )	( )
40. Is Hepatitis B vaccine available in Somaliland?	( )	( )	( )

Part 4: Attitudes towards HB

No	Attitude Items	Responses
1	Do you think you can get Hepatitis B?	Yes No I don‘t know
2	What would be your reaction if you found that you have Hepatitis B?	a) Fear b) Shame c) Surprise d) Sadness e) Other: _____
3	Who would you talk to about your illness?	a) Physician b) Husband c) Parents d) Other Relatives e) Friends f) No one g) Other: _____

4	What will you do if you think that you have symptoms of Hepatitis B?	a) Go to Health facility b) Go to Physician c) Go to Traditional healer d) Do nothing e) Other: _____
5	If you have symptoms of Hepatitis B, at what stage will you go to the health facility?	a) Own treatment fails b) After 3-4 weeks of the appearance of symptoms c) As soon as I realize the symptoms are of Hepatitis B d) Will not go to physician e) Other: _____
6	How expensive do you think is the diagnosis and treatment of Hepatitis B?	a) Free b) Reasonable c) Somewhat expensive d) Expensive e) Do not Know f) Nothing to worry e) Don't know f) Other: _____
7	What worries you most have if you will be diagnosed with Hepatitis B?	a) Fear of death b) Fear of disease spread to family c) Cost of treatment d) Isolation from the society e) Other: _____

Part 4: Practices towards HB

Items	Yes	No	Don't know
9. Have you done screening for Hepatitis B?	( )	( )	( )
10. Would you avoid sharing the toilet with Hepatitis B infected person?	( )	( )	( )
11. Would you share food with a Hepatitis B infected person?	( )	( )	( )
12. Do you ask for new syringe and screening of blood before transfusion?	( )	( )	( )
13. Do you ask your barber to change blade/or for safe equipment for ear and nose piercing?	( )	( )	( )
14. In case you are diagnosed with Hepatitis B, would you go for further investigation and treatment?	( )	( )	( )
15. Do you avoid meeting Hepatitis with B patients?	( )	( )	( )
16. Have you ever participated in health education program related to Hepatitis B?	( )	( )	( )

ANNEX 3: Ethical Approval

JAMHUURIYADA SOMALILAND
Wasaarada Caafimaadka

MINISTER

REPUBLIC OF SOMALI LAND
Ministry of Health

Ref: MoH/M/ 472 /1.0/2017 **Date: July 23, 2017**

To: Hussein Jama Had

Ref: Ethical clearance letter

Research Title: "DETERMINING PREVALENCE OF HEPATITIS BS AG INFECTION AND ASSOCIATED RISK FACTORS AMONG PREGNANT WOMEN AND THEIR KNOWLEDGE ATTITUDES AND PRACTICES TOWARDS HB INFECTION, HARGEISA CITY, SOMALILAND 2018".

Ethical consideration:

The ethical clearance committee received and reviewed the items in connection with the above study to be conducted in Somaliland in 2017.

1. Research protocol (English version)
2. Questionnaire (English version)

After reviewing the above documents, the ethical clearance committee confirms that your research proposal *"has been ethically considered and approved"*.

Best Regards,

Dr. Sulieman Essa Ahmed
H.E. The Minister
Ministry of Health,
Somaliland