

Prevalence of Hepatitis B and C Virus among Barbers and Mobile Nail Clippers in the Sekyere East District and Asante Mampong Municipality of Ghana

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Abstract: Viral infections that cause hepatitis B and C are major global health issues. Barbers and mobile nail cutters are regarded as a high-risk category for these diseases since they frequently come into touch with sharp objects. Jobs in underdeveloped nations, like Ghana, fall behind in protecting the security of their employees at work. Barbers and mobile nail clippers are among the low-literate, unregulated occupational groups; increasing direct skin contact and the use of blades or razors can expose barbers and mobile nail clippers to their clients' bodily fluids. The study was designed to find out the prevalence of HBV and HCV among Barbers and mobile nail clippers and to find out about their knowledge, attitudes, practices, and occupational exposure in the Sekyere East District and Asante Mampong Municipality of Ghana. A structured questionnaire and common HBV and HCV test kits were used to interview and test 300 B&MNCs from Sekyere East and Mampong. The proportions of knowledge, attitude, practices, and occupational exposure were measured using a scale. HBV and HCV were more common in barbers (21.33% and 21%, respectively), whereas they were more common in MNCs (29% and 25%, respectively). In contrast to MNCs, barbers had less understanding of HBV and HCV, but they were far more knowledgeable about the routes of transmission. With the exception of 28.33% of barbers who routinely utilize the same accessories without altering, practices and attitudes among barbers were generally favorable. The fact that 44.33% of MNCs neither changed nor sterilized their tools made the situation much more concerning. The study demonstrated that a significant segment of the population, particularly the young, uses the services of barbers and mobile nail trimmers. They could spread HBV and HCV covertly. A regulating organization is required to oversee all mobile nail clippers, screen and license them, and ensure regular workshops and training sessions to advance their education and expertise. It is highly advised that barbers and mobile nail clippers be randomly but frequently observed to keep them on their toes and assist eradicate certain unsanitary behaviors among them that could result in infecting themselves and their clients.

Keywords: Hepatitis B, Hepatitis C, Barbers, Mobile Nail Clippers, Knowledge, Attitude, Practice, Occupational Exposure and Prevalence

1. Introduction

Barbers and mobile nail clippers work in environments where they could come into contact with dangerous blood-borne diseases like hepatitis B virus (HBV) and hepatitis C virus (HCV). Clients frequently contract occupational diseases from barbers and mobile nail clippers (B&MNCs), including HBV and HCV. Hepatitis is characterized by the presence of inflammatory cells in the tissues of the liver that can cause fibrosis or cirrhosis [1]. Hepatitis is characterized by the inflammation of the liver.

Sharing the same sharp objects, mother-to-child blood contact, and unsafe sexual contact are all effective ways for HBV to spread from one infected person to another. The most common methods of transmission are perinatal infections, skin and mucous membrane infections brought on by contaminated blood or bodily fluids, contaminated medical equipment, and exchanging of infected syringes and needles amongst injecting drug users. Additionally, infections can come from tattooing, ear piercing, acupuncture, and dialysis [3].

Upwards of 350 million individuals globally have a chronic, lifelong infection with HBV, and much more than one million people die annually from liver cirrhosis and cancer, according to a 2009 WHO report [3-5]. Additionally, 170 million people are thought to have chronic HCV infection [6]. The prevalence of HBV infection is high in developing nations. According to estimates from the WHO, Africa has an average incidence of HBV infection of more than 10%. According to the Centers for Disease Control (CDC), 3.9 million people (1.8%) have HCV infections, and 2.7 million of such infections will progress to chronic disease [2].

People with poorer socioeconomic statuses, older age groups, and those exposed to blood products have greater rates of HBV prevalence [3]. Negligence when using sharp objects may increase the risk of blood-borne illnesses, which could result in major health issues for B & MNCs and their customers [9]. A significant risk factor for viral hepatitis in Italy has been found as razor sharing and shaving in barbershops [10]. It has also been noted to be a risk factor for HCV in patients who are institutionalized [11]. According to studies conducted in the US, there is a 27 to 37 percent chance of contracting HBV after being cut with a sharp object by a client who has the virus. Additionally, there was a 3 to 10% chance of contracting HCV after being harmed by a sharp object from an infected person. Hepatitis B transmits with a high rate of efficiency. For instance, HBV can be spread to a vulnerable host by an unintentional splash of as little as 108 ml of infected blood in the eye [7].

Since its release 20 years ago, an HBV vaccination has been safe and effective in avoiding cirrhosis and severe liver cancer [3]. There isn't an HCV vaccination available right now [6]. For pre and/or post exposure prophylaxis, the hepatitis B vaccine is advised for all individuals at risk of coming into contact with blood, blood products, or bodily

secretions.

Ideally, hepatitis B vaccination should be finished before beginning a barbering or nail-clipping job. Because hepatitis B vaccination provides long-term protection from hepatitis B infection, it prevents the virus from being transmitted from B & MNCs to clients and vice versa. [3, 8]. Except for what certain hospitals are doing for their medical staff and some corporate groups, routine HBV immunization for all individuals is not yet practiced in Ghana. Post exposure prophylaxis (PEP) for HBV is not currently available in Ghana. In underdeveloped nations like Ghana, the average person cannot afford the existing HBV therapy [5].

According to prevalence statistics of 1.5 percent, 2.3 percent, and 3.2 percent for the WHO's Americas, Europe, then Africa regions, respectively, there are differences in the burden of HCV around the world [13]. According to Madhava et al [14]'s estimation, 3.0 percent of Sub-Saharan Africans had HCV in 2002, while the prevalence rate in the West African region, where Ghana is located, was 2.4 percent. A recent study by Rao et al. [15] gives this Sub-Saharan Africa region a slightly lower frequency of 2.65 percent. On the other hand, there are worries that the prevalence numbers for Sub-Saharan Africa may be significantly understated due to factors like the region's dearth of HCV representative surveys [16].

Despite the regional differences in HCV prevalence, the trends of HCV epidemiology differ substantially even within countries. In the United States, people aged 30-49 have a high HCV prevalence rate, whereas in nations like China and Italy, people over 50 account for the majority of infections [17]. It is important to note that accurate documentation of the HCV burden is difficult to conduct in order to determine the disease's exact incidence and prevalence in any given nation. These difficulties include the lack of evidence that can discriminate between acute and chronic infections because the majority of acute HCV infections frequently show no symptoms [18].

Globally, when the effects of HCV have been properly investigated, it has been discovered that there are significant implications for national health systems [19]. According to Razavi et al. [20], the lifetime cost of an HCV infection in the US in 2011 was projected to be \$64,490; however, when medical inflation is taken into account, this cost might increase to \$205,760 (\$154,890-\$486,890). The lifetime cost of HCV infection for Canadians in 2013 was estimated by Myer et al. [21] to be \$64,694; however, if liver transplantation is required, the cost might reach \$327,608. In Ghana, viral hepatitis, especially HCV, is thought to be a major cause of morbidity and mortality and needs more attention [22]. There are currently insufficient comprehensive aggregate statistics on the prevalence of HCV in Ghana [23]. Based on data from the WHO, Lavanchy [13] claimed that Ghana had a nationwide HCV prevalence rate of 1.7% in 2010.

Ghana's HCV prevalence rate was reported to be between 0.2 and 9.4 percent in a systematic analysis by Riou et al. [24]

that focused on HCV seroprevalence in Africa. There hasn't been another comprehensively completed literature and conceptual review on the prevalence, occupational exposure, knowledge, attitude, and behaviors of B & MNCs in Sekyere East and Asante Mampong municipal districts of chronic HCV and HBV infection in Ghana.

This finding underlines once more how little information exists about the prevalence of HCV and HBV among B&MNCs in Ghana. Accurate prevalence rate based on thorough and current evidence compilation are crucial for informing evidence-based decision making, public health research, and programs prioritization in Ghana. This study, sought to estimate the prevalence of chronic HCV and HBC infection among B&MNCs in Ghana's Asante Mampong Municipality and Sekyere East District. Additionally, it aimed to evaluate B&MNCs' exposure to the workplace and their knowledge, attitudes, and practices in order to inform interventions made for the prevention and management of HBV and HCV infections.

2. Methods and Materials

2.1. Study Area, Period, and Design

Both the Sekyere East district and the Asante Mampong municipal are found in Ghana's Ashanti region. Sekyere East District, located in the eastern portion of the area, contains 62,172 residents, or 1.3% of the Ashanti regional population [12]. Males make up 47.5%, while females make up 52.5%. Compared to rural areas, where 45.9% of the population lives, more than half (54.1%) of the population lives in urban areas. The district's population is young, with a large base demographic pyramid that tapers off with a relatively small number of old people. Mampong Municipal, which has a populace of 88,051, is situated in the northern portion of the area [12]. The district has a 94:1 gender ratio. The district's population is shaped like a broad-base population pyramid that tapers off with a relatively small proportion of elderly people. The district's age dependency ratio is 84.1, and men's age dependency ratio is greater (86.9) than females' (81.6).

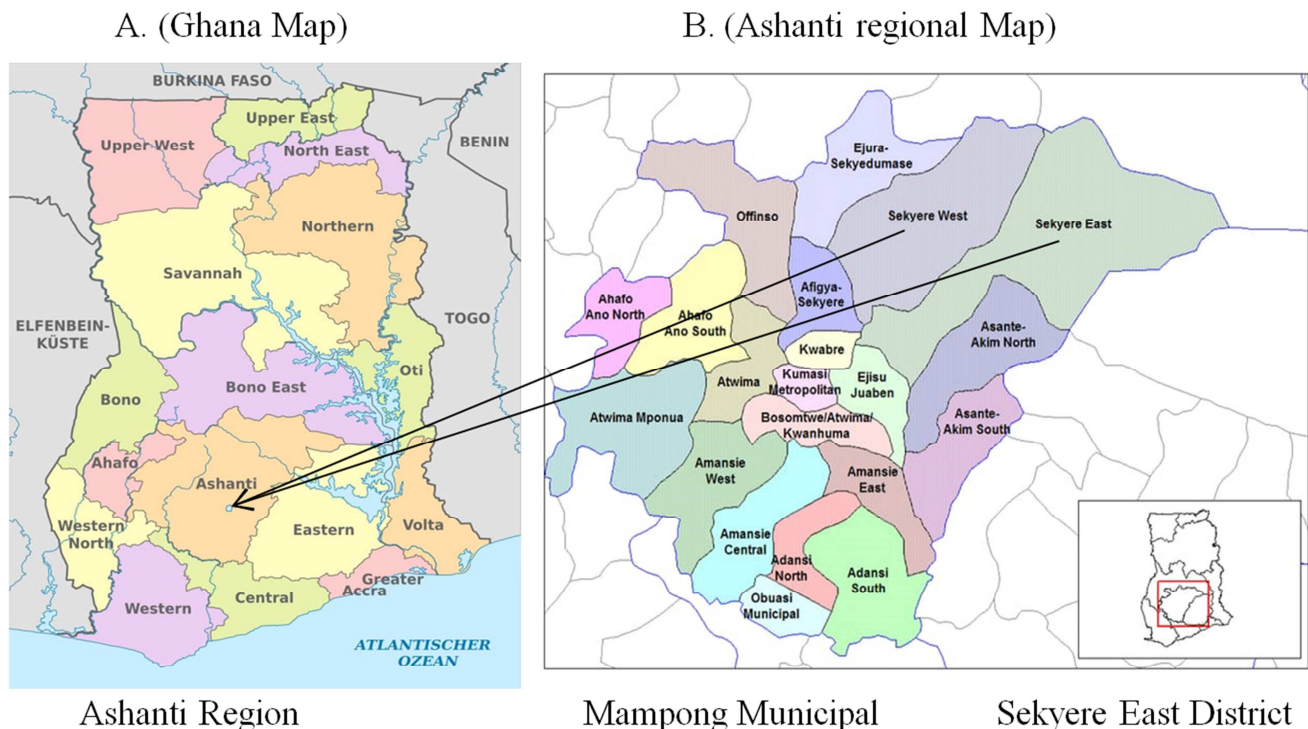


Figure 1. Map of Ashanti Region, Showing the Study Area.

Between 1 August 2020 and 31 October 2021, a descriptive cross-sectional survey was carried out in Ghana's Sekyere East area and Asante Mampong Municipality. There were a total of about 284 barbers officially registered with the local government authority in the municipal and district respectively and more than 200 unregistered MNCs as well. 150 barbers and 150 MNCs were randomly selected for the test. The subjects in this research were not vaccinated against HBV & HCV.

2.2. Sample Size and Sampling Technique

The study population included a total of 300 barbers and

mobile nail clippers.

2.3. Data Collection

Quantitative and qualitative data collection tools were used. Blood samples were collected from 300 respondents. The lobe of the finger was first disinfected with alcohol; blood lancet was used to perforate the finger which was later squeezed to drop small quantity of blood of about 15×15mm at the end of the test kit after which a drop of buffer was kept on the drop of blood for an accurate reading. The results were then recorded on the bottom of the questionnaire.

2.4. Quantitative Study

In the Sekyere East and Asante Mampong Municipality of Ghana, a standardized questionnaire was given to B & MNCs to determine whether they were aware of the risks associated with contracting HBV and HCV. Data on respondents' demographics, as well as information on respondents' exposure to, prevalence of, knowledge of, attitudes toward, and use of B & MNCs, were included.

2.5. Qualitative Study

The use of personal protection equipment was observed throughout the study by observers who were not participants (PPE). Based on workplace safety procedures described by national and international requirements, an observable check list was employed to achieve this.

2.6. Data Analysis

Using SPSS version 20, the gathered data was processed, and the results of the Chi square (X²) test and descriptive statistics were created. To illustrate the similarities and distinctions between parameters, tables were created.

3. Results

3.1. Bio Data of Respondents

The sociodemographic characteristics of the study population are shown in Table 1. The percentage of barbers with formal education is about 50% (J.H.S. 19%, S.H.S. 24%,

and Tertiary 7%), as opposed to the percentage of mobile nail cutters with formal education, which is only 21% (J.H.S. 3%, Primary 18%). There was a substantial difference in the respondent's educational status ($P = 0.000$). The majority of respondents—36 percent (107) of barbers and 4 percent (13) of mobile nail clippers—were single. Of the barbers, 14% were married compared to 10% (30) of the nail technicians on the go. There was a substantial difference in the respondents' marital status ($P = 0.000$). Young and middle-aged youth (17 percent (52) and 14 percent (41)) frequently go to barbershops to get their hair cut. While 7% (20) of youngsters under the age of five also visit the barbershop to get their hair cut, 13% (37) of senior adults go there to get their beards shaved. Additionally, 15% (44) of the elderly hire mobile nail clippers, while 35% of youth, or 21% (63) young people and 14% (43) middle-aged adults, frequently use their services. $P = 0.000$ indicated a significant difference for the population served. The average age of barbers was 27, with a minimum age of 19 and a maximum age of 40, whereas the average age of active mobile nail clippers was 26, with a minimum age of 18 and a maximum age of 35. Barbers have an average of 4.20 years of professional experience, ranging from a minimum of 1 year to a high of 11 years. However, MNCs have employees with an average working experience of 4.68 years, with a minimum of 1 year and a maximum of 12 years. Barbers provided services to an average of 32.66 clients per day, ranging from 19 to 55 clients per day. MNCs provide services to 26.73 average individuals, with 19 minimum and maximum.

Table 1. Bio data of respondents.

Parameter	Barbers	Mobile Nail clippers	Total	χ^2 (p-value)
Educational status				
J.H.S	57 (19%)	9 (3%)	66 (22%)	0.000
None	0 (0%)	88 (29%)	88 (29%)	
Primary	0 (0%)	53 (18%)	53 (18%)	
S.H.S	71 (24%)	0 (0%)	71 (24%)	
Tertiary	22 (7%)	0 (0%)	22 (7%)	
Marital status				
Married	43 (14%)	30 (10%)	73 (24%)	0.000
Separated	(0%)	13 (4%)	13 (4%)	
Single	107 (36%)	107 (36%)	214 (72%)	
Category of people serviced				
Elderly	37 (12%)	44 (15%)	81 (27%)	0.000
under 5 years	20 (7%)	0 (0%)	20 (7%)	
young people	52 (17%)	63 (21%)	115 (38%)	
Middle Age	41 (14%)	43 (14%)	84 (28%)	
Age				
Average	27.093	26.367		
Maximum	40	35		
Minimum	19	18		
Work experience				
Average	4.20	4.68		
Maximum	11	12		
Minimum	1	1		
Daily number of people serviced				
Average	32.66	26.73		
Maximum	55	38		
Minimum	19	12		

3.2. Knowledge and Perception of B & MNCs on HCV and HBV

Less barbers (27.33 percent (82) disagreed with the statement that they knew about HCV and HBV, compared to 22.67 percent (68) who agreed). The MNCs' position was utterly contrary. 28 percent (84), as opposed to 22 percent (66), stated they agreed. There was no discernible difference between the respondents' knowledge of HCV and HBV ($P = 0.065$). Regarding the source of their knowledge, radio was more prevalent than television among barbers (42.57%) while television was less prevalent (12.84%). Meanwhile, 10.81 percent (16) of MNCs and 33.78 percent (50) of MNCs respectively acquired their expertise through radio and television. There was a substantial difference between the sources of knowledge ($P = 0.000$). 27 percent (82) of barbers said they were aware of the effects of HCV and HBV infection, while 23 percent (68) said they were not. 35 percent (106) of MNCs replied no, compared to 15 percent (44) who said yes. Again, there is a substantial difference (P

$= 0.000$) between what is known about the effects of contracting HCV and HBV. When asked if HCV and HBV were curable, exactly 25% (74) of barbers said yes, whereas precisely 25% (76) of them said no, as shown in table 3 below. The majority of MNCs, 35% (106) replied "no," whereas 15% (44) felt "it is treatable." There was a substantial difference between HCV and HBV's ability to be treated ($P = 0.000$). 33 percent (99) of barbers said that HCV and HBV can be prevented, whereas 17 percent (51%) disagreed. 27 percent (82) of MNCs agreed that HCV and HBV are avoidable, compared to 23 percent (68) who disagreed. Regarding whether HCV and HBV can be prevented, there was a substantial difference ($P = 0.000$). Only 20% (or 61 out of 89) of barbers had sufficient information in regards to the danger of developing HCV and HBV. 42 percent (125) of MNCs reported having knowledge of the danger of developing HCV and HBV, compared to 25 percent who reported having knowledge of the risk. Knowledge on there was a significant difference ($P = 0.000$).

Table 2. Knowledge of B & MNCs on HCV and HBV.

Parameter	Barbers	Mobile Nail clippers	Total	χ^2 (p-value)
Knowledge on HCV and HBV				
Yes	68 (22.67%)	84 (28%)	50.67%	0.065
No	82 (27.33%)	66 (22%)	49.33%	
Sources of knowledge				
TV	19 (12.84%)	16 (10.81%)	76.35%	0.000
Radio	63 (42.57%)	50 (33.78%)	23.65%	
Knowledge on Consequences of HCV and HBV contraction				
Yes	82 (27%)	44 (15%)	126 (42%)	0.000
No	68 (23%)	106 (35%)	174 (58%)	
HCV and HBV is curable				
Yes	74 (25%)	44 (15%)	118 (39%)	0.000
No	76 (25%)	106 (35%)	182 (61%)	
HCV and HBV is Preventable				
Yes	99 (33%)	82 (27%)	119 (40%)	0.000
No	51 (17%)	68 (23%)	181 (60%)	
Risk in contracting HCV and HBV				
Yes	61 (20%)	25 (8%)	86 (29%)	0.000
No	89 (30%)	125 (42%)	214 (71%)	

3.3. Risk and Occupational Health and Safety Practices by B & MNCs



Figure 2. Tools and equipment's used by mobile nail clippers.

According to table 4 below, the majority of barbers who responded—21% (63)—confirmed using sterilizers as a safety precaution, along with 15% (46) who use hand

sanitizers, 8% (24) who use gloves as a precaution, and 6% (17) who use none. While the majority (40 percent (121) of MNCs don't use any PPE, 10% (29) of them use hand sanitizer. There was a substantial difference in the safety measures used by B&MNCs ($P = 0.000$). The majority of barbers—27% (81)—confirmed that they frequently use personal safety equipment. Additionally, 14.67% (44) use PPE only when necessary, and 8.33% (25) occasionally. More specifically, 22.33 percent (67) and 27.67 percent (83) of MNCs employ PPE occasionally, respectively. On the use of PPE, there was a significant difference ($P = 0.000$). Majority Barbers make up 41.33 percent (124) of the workforce with operating licenses, while 8.67 percent (26) do not. Additionally, 50% (150) of MNCs do not possess an operational license. Again, the fact that their business is licensed to operate makes a substantial influence ($P = 0.000$). Regarding the usage of separate accessories, 21.67 percent

(65) of barbers use separate accessories, compared to 28.33 percent (85) who do not. Again, just 5.67 percent (17) of MNCs employ different accessories in the performance of their duties, or 44.33 percent (133). On the use of different accessories, there was a significant difference ($P = 0.000$). a large percentage 7.33 percent (22) and 35.33 percent (106) of barbers utilize scissors and combs respectively when performing their jobs. In MNCs, scissors are used by 5.67 percent (17) while other instruments are used by 44.33

percent (133). There was a significant difference in the occupational tools utilized ($P = 0.000$). Cuts and illness transmission were occupational concerns related to the job of B & MNCs. The majority of barbers said that cuts posed the greatest risk (47 percent of 40), followed by disease transmission (24%). (21). The percentages for cuts at MNCs were 14% (12) and illness contractions were 11% (9). The occupational risks connected to the work of B & MNCs differed significantly ($P=0.000$).

Table 3. Risk and Occupational Health and safety practices by B & MNCs.

Parameter	Barbers	Mobile Nail clippers	Total	χ^2 (p-value)
Risk of B & MNC work				
Cut	40 (47%)	14 (16%)	54 (63%)	0.000
Contraction of disease	21 (24%)	11 (13%)	32 (37%)	
Safety measures				
Use of sterilizers	63 (21%)	0 (0%)	63 (21%)	
Wear gloves	24 (8%)	0 (0%)	24 (8%)	0.000
Hand sanitizers	46 (15%)	29 (10%)	75 (25%)	
None	17 (6%)	121 (40%)	138 (46%)	
Usage of PPE				
Frequently	81 (27%)	0 (0%)	81 (27%)	
Once a while	25 (8.33%)	67 (22.33%)	92 (30.66%)	0.000
When need arise	44 (14.67%)	83 (27.67%)	127 (42.34%)	
Hold license				
Yes	124 (41.33%)	0 (0%)	124 (41.33%)	0.000
No	26 (8.67%)	150 (50%)	176 (58.67%)	
Usage separate accessories				
Yes	65 (21.67%)	17 (5.67%)	82 (27.33%)	0.000
No	85 (28.33%)	133 (44.33%)	218 (72.67%)	
Occupational tools				
Blade	106 (35.33%)	0 (0%)	106 (35.33%)	0.000
Scissors	22 (7.33%)	17 (5.67%)	39 (13%)	
Comb	22 (7.33%)	0 (0%)	22 (7.33%)	
None	0 (0%)	133 (44.33%)	133 (44.33%)	



Figure 3. Tools and equipment's used by barbers.

3.4. Transmission Route of Hepatitis and Its Effect

The majority of barbers were unaware of how hepatitis is spread. Body fluid contact can spread hepatitis by 22.67

percent (68), 13.67 percent (41) barbers, passing down from parents to children by 7.33 percent (22) barbers, and having intercourse with an infected individual by 6.33 percent (19) barbers. 35.33 percent (106) of MNCs said they were unsure of the cause of hepatitis, 3.67 percent (11) said it can be brought on by excessive work and body fluid contact, 4.67 percent (14) said it can be brought on by contact with sharp objects, and 2.67 percent (8) said it can be brought on by having sex with an infected person. Regarding the respondents' perceptions on the cause of hepatitis, there was a significant difference ($P = 0.000$). According to the responses, the effects of HCV and HBV infection included tiredness, kidney, and liver impairment. According to the barbers, HCV and HBV infection resulted in liver impairment in proportions of 14 percent (42%) and 13 percent (40%) respectively. For the MNCs, tiredness was 4 percent, liver damage was 5 percent, and acute kidney injury was 6 percent (12). However, a larger percentage of respondents (B & MNCs) were unaware of the effects of HCV and HBV infection. In terms of how the respondents responded to the contraction of HBV and HCV, there was a substantial difference ($P = 0.000$).

Table 4. Transmission of hepatitis and its effect.

Parameter	Barbers	mobile nail clippers	Total	χ^2 (p-value)
Body fluid contact	41 (13.67%)	11 (3.67%)	52 (17.33)	0.000
Contact with sharp objects	0	14 (4.67%)	14 (4.67%)	
Excessive work	0	11 (3.67%)	11 (3.67%)	
From parents to offspring	22 (7.33%)	0	22 (7.33%)	
No idea	68 (22.67%)	106 (35.33%)	174 (58%)	
Sex with infected person	19 (6.33%)	8 (2.67%)	27 (9%)	0.000
Effect of contraction of HBV & HCV				
Fatigue		12 (4%)	12 (4%)	
Kidney damage	40 (13.33%)	18 (6%)	58 (19.33%)	
Liver damage	42 (14%)	14 (4.67%)	56 (19.67)	
No idea	68 (22.67%)	106 (35.33%)	174 (58%)	

3.5. HB Vaccination and Prevalence of HCV and HBV

While just a small percentage (8%) of barbers (42%) had had their vaccinations, 50% (150) of MNC employees (all of them worked for MNCs) had not. Among the responders, there was a significant difference ($P = 0.000$) regarding Hepatitis vaccination. Less barbers (29%) than 21% (63%) tested positive for HCV, indicating a lower prevalence. Additionally, a sizable fraction of MNCs tested positive for

HCV in 24.67% of cases (74), while 25.33% of cases (76) tested negative. The prevalence of HCV among barbers and mobile nail clippers showed no statistically significant difference ($P=0.132$). Despite this, a total of 29.33 percent (88) of MNCs tested positive for HBV whereas only 20.67 percent (62) of barbers tested positive for the virus (28.67% (86) versus 21.33 percent (64)). The prevalence of HBV differed significantly ($P=0.005$) between barbers and mobile nail cutters.

Table 5. HB vaccination and Prevalence of HCV and HBV.

Parameter	Barbers	Mobile Nail clippers	Total	χ^2 (p-value)
Vaccinated				0.000
No	125 (42%)	150 (50%)	275 (92%)	
Yes	25 (8%)		25 (8%)	
HCV				0.132
Positive	63 (21%)	76 (25.33%)	46.33%	
Negative	87 (29.00%)	74 (24.67%)	53.67%	
HBV				0.005
Positive	64 (21.33%)	88 (29.33%)	50.67%	
Negative	86 (28.67%)	62 (20.67%)	49.33%	

4. Discussion

The prevalence of HBV and HCV among Ghanaian barbers and nail cutters has never been formally established before this investigation. In Ghana, getting your hair cut by a barber and your nails clipped by a nail cutter is customary. A barbershop is a potential setting where individuals, including barbers themselves, may be exposed to the blood of infected individuals by contaminated tools [32], whereas nail clippers are regular people who go about their daily lives trimming people's nails. The average of B&MNCs revealed that these respondents' jobs are largely held by young people. When compared to [25], this study showed that the majority of barbers were between the ages of 18 and 60. Barbers had higher levels of education than nail clippers, but they knew much less about HBV and HCV than MNC. Numerous researches have revealed that barbers have little awareness of HBV and HCV. Given that the majority of the respondents were unmarried, the respondents' ages had an impact on their marital status. Similar to other published studies, the barbers' lack of knowledge of the HBV's transmission mechanisms and effects is concerning. Contrary to the findings of Acheampong, (2011) and Adoba et al. [33], which suggested that more than

60% of barbers interviewed in Obuasi did not know how HBV and HCV were contracted or transmitted, this study discovered that the majority of barbers interviewed in Medina expressed a commendable level of knowledge about HBV and HCV by the time of the interview. About 70% of individuals in Pakistan were unaware about hepatitis [30]. Similar to this study, studies conducted by [25–27] indicated a lack of understanding and false beliefs regarding the propagation of HBV. Similar research by Mohamed & Kwarteng [31] revealed that barbers in Ghana had little understanding of the channels of transmission. The findings of this study were different from those of Iranian barbers, who were well-versed in the modes of transmission and effects of HBV [30]. Shavings from barbers have been linked to an increased risk of HBV transmission [28, 29]. According to reports from numerous nations, sharing blades and using equipment specific to barbers—which includes nail clippers and barbers—can spread HBV. This suggests that HBV and HCV could potentially be transmitted through the work equipment used by B&MNCs. Similar to [31], razor blades were not reused after being used on a client. Barbers' occupational health and safety practices were far superior to those of MNCs. MNCs solely use hand sanitizer instead of hand gloves or sterilizers. Barbers, on the other hand, utilize gloves, hand sanitizers, and UV radiation sterilizers. In

every barbershop that was inspected for this study, a UV radiation sterilizer cabinet was visible. These sterilizers weren't in operation when people were being served; they were only used at night. Lack of knowledge regarding the sterilization process may be the cause of these poor professional practices. Barbers with a lot of clients also frequently utilized the same pair of hair clippers without disinfecting them. It is possible to avoid getting HBV by being vaccinated, but table 5's results show that B&MNCs have a very low rate of HBV vaccination. This is in line with a study on the availability of HBV vaccines that found that only 10.4% of 231 respondents were aware of it. This is evidence that both B&MNCs are less concerned about the requirement to receive an HBV vaccination. Barbers had a relatively low prevalence of HBV and HCV, with respective rates of 21.33 and 21.0%. These percentages are greater than the 14.5 percent and 0.5 percent prevalence of HBV and HCV found in [33], respectively, by 21.33 and 21 percent. However, the prevalence of HBV and HCV among barbers was extremely high. HBV and HCV positivity rates were high among the subjects (50.67% and 46.33%), though the HCV positivity rate was a little lower. The serious implications linked to MNC practices are confirmed by this.

5. Conclusion

Considering the area of study of this research, a significant segment of the population, particularly the young, uses the services of barbers and mobile nail trimmers. They could spread HBV and HCV covertly. Given these serious repercussions of the profession, health professionals should prioritize educating the public about the risks of HBV and HCV among barbers, mobile nail technicians, and their customers. It will be necessary to run educational campaigns on hygienic practices for barbershop tools and equipment, as well as for mobile nail clippers, to combat and prevent these diseases. A regulating organization is required to oversee all mobile nail clippers, screen and license them, and ensure regular workshops and training sessions to advance their education and expertise. It is highly advised that barbers and mobile nail clippers be randomly but frequently observed to keep them on their toes and assist eradicate certain unsanitary behaviors among them that could result in infecting themselves and their clients. The regulatory agency in charge of regulating the activities of barbers and mobile nail clippers must also establish uniform hygiene standards and apply restrictions on open or probable offenders. Both B&MNCs must get a routine HBV vaccine before or after starting a business operation.

Authors' Contributions

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

Conflict of Interest

Authors have declared that no conflict of interests exist.

References

- [1] Chang, C. M. 2007. "Hepatitis B virus infection". *Semin Fetal Neonatal Med* 12 160–167.
- [2] M. Askarian, M. Yadollahi, F. Kouchak, M. Danaei, V. Vakili, and M. Momeni, "Precautions for health care workers to avoid hepatitis b and c virus infection," *International Journal of Occupational Medicine and Environmental Health*, vol. 2, no. 4, pp. 191–198, 2011.
- [3] Y. M. Mesfin, K. T. Kibret, and O. Schildgen, "Assessment of Knowledge and Practice towards Hepatitis B among Medical and Health Science Students in Haramaya University, Ethiopia," *PLoS ONE*, vol. 8, no. 11, p. e79642, 2014.
- [4] S. Chouhan, "Hepatitis B prophylaxis practice among medical students: An overview," *Hepatitis B Annual*, vol. 5, no. 1, p. 102, 2008.
- [5] B. Anagaw, Y. Shiferaw, Y. Belyhun et al., "Seroprevalence of Hepatitis B and C Viruses among Medical Waste Handlers at Gondar Town Health Institutions, Northwest Ethiopia," *BMC Research Notes*, vol. 5, no. 55, 2012.
- [6] WHO, Guidance on Prevention of Viral Hepatitis B and C among People Who Inject Drugs, Switzerland, Geneva, 2012.
- [7] FMOH, Infection Prevention and Patient Safety: Reference Manual for Service Providers and Managers in Healthcare Facilities of Ethiopia, Addis Ababa, Ethiopia, June 2010.
- [8] APIC, Text of Infection Control and Epidemiology, The Association for Professionals in Infection Control and Epidemiology, New York, NY, USA, 2nd edition, 2005.
- [9] European Centre for Disease Prevention and Control, "Hepatitis B and C surveillance in Europe," ECDC, Stockholm, 2012.
- [10] R. Zampino, A. Boemio, C. Sagnelli et al., "Hepatitis B virus burden in developing countries," *World Journal of Gastroenterology*, vol. 21, no. 42, pp. 11941–11953, 2015.
- [11] M. Abdalwhab and M. Nafi, "Sero-frequency of Hepatitis B Infection among Health Care Workers in Khartoum," *American Journal of Research Communication*, vol. 2, p. 12, 2014.
- [12] Ghana Statistical Service (2013). 2010 Population and Housing Census. Summary Report of Final Results. GSS, Accra.
- [13] Lavanchy D. Evolving epidemiology of hepatitis C virus. *Clin Microbial Infect.* 2011; 17: 107–15.
- [14] Madhava V, Burgess C, Drucker E. Epidemiology of chronic hepatitis C virus infection in sub-Saharan Africa. *Lancet Infect Dis.* 2002; 2 (5): 293–302.
- [15] Rao VB, Johari N, du Cros P, Messina J, Ford N, Cooke GS. Hepatitis C seroprevalence and HIV co-infection in sub-Saharan Africa: a systematic review and meta-analysis. *Lancet Infect Dis.* 2015; 15 (7): 819–24.
- [16] Layden JE, Phillips R, Opore-Sem O, Akere A, Luke A, Tayo BO, Cooper RS. Hepatitis C in sub-Saharan Africa: urgent need for attention. *Open Forum Infect Dis.* 2014; 1 (2): ofu065.

- [17] Alter MJ. Epidemiology of hepatitis C infection. *World Journal of Gastroenterology*. 2007; 13 (17): 2436–41.
- [18] Mohd Hanafiah K, Groeger J, Flaxman AD, Wiersma ST. Global epidemiology of hepatitis C virus infection: new estimates of age-specific antibody to HCV seroprevalence. *Hepatology*. 2013; 57 (4): 1333–42.
- [19] Adler M, Goubau P, Nevens F, Van Vlierberghe H. Hepatitis C virus: the burden of the disease. *Acta Gastroenterol Belg*. 2002; 65: 83–6.
- [20] Razavi H, ElKhoury AC, Elbasha E, Estes C, Pasini K, Poynard T, Kumar R. Chronic Hepatitis C Virus (HCV) disease burden and cost in the United States. *Hepatology*. 2013; 57 (6): 2164–70.
- [21] Myers RP, Krajden M, Bilodeau M, Kaita K, Marotta P, Peltekian K, Ramji A, Estes C, Razavi H, Sherman M. Burden of disease and cost of chronic hepatitis C virus infection in Canada. *Can J Gastroenterol Hepatol*. 2014; 28 (5): 243–50.
- [22] Hepatitis Foundation of Ghana. Viral Hepatitis in Ghana: The Role of the Government. 2014. Available online at http://theobaldhepb.org/?page_id=624. Accessed 01 Jan 2016.
- [23] Ampofo W, Nii-Trebi N, Ansah J, Abe K, Naito H, Aidoo S, Nuvor V, Brandful J, Yamamoto N, Ofori-Adjei D, Ishikawa K. Prevalence of blood-borne infectious diseases in blood donors in Ghana. *Journal of Clinical Microbiology*. 2002; 40 (9): 3523–5.
- [24] Riou J, Aït Ahmed M, Blake A, Vozlinsky S, Brichler S, Eholié S, Boëlle PY, Fontanet A. HCV epidemiology in Africa group. Hepatitis C virus seroprevalence in adults in Africa: a systematic review and meta-analysis. *Journal of Viral Hepatitis*. 2016; 23 (4): 244–55.
- [25] Imran Naeem Abbasi, Zafar Fatmi, Muhammad Masood Kadir, and Nalini Sathiakumar (2014). Prevalence of Hepatitis B Virus Infection among Barbers and Their Knowledge, Attitude and Practices in the District Of Sukkur, Sindh. *International Journal of Occupational Medicine and Environmental Health* 2014; 27 (5): 757 – 765. [Http://Dx.Doi.Org/10.2478/S13382-014-0299-Z](http://Dx.Doi.Org/10.2478/S13382-014-0299-Z)
- [26] Jokhio A, Bhatti T, Memon S. Knowledge, attitudes and practices of barbers about hepatitis B and C transmission in Hyderabad, Pakistan. *East Mediterr Health Journal*. 2010; 16: 1079–84.
- [27] Al-Rabeei NA, Al-Thaifani AA, Dallak AM. Knowledge, attitudes and practices of barbers regarding hepatitis B and C viral infection in Sana'a City, Yemen. *Journal of Community Health*. 2012; 37 (5): 935–9, <http://dx.doi.org/10.1007/s10900-011-9535-7>.
- [28] Van Herck K, Vorsters A, Van Damme P. Prevention of viral hepatitis (B and C) reassessed. Best practice and research. *Best Pract Res Clin Gastroenterol* 2008; 22: 1009-29.
- [29] Yang J, Hall K, Nuriddin A, Woolard D. Risk for hepatitis B and C virus transmission in nail salons and barbershops and state regulatory requirements to prevent such transmission in the United States. *J Public Health Manag Pract* 2014; 20: E20-30.
- [30] Tahereh Khairkhah, Ayat Shamsa, Azam Roohi, Jalal Khoshnoodi, Fatemeh Vand-Rajabpour, Mina Tabrizi, Saeed Zarei, Forough Golsaz-Shirazi, and Fazel Shokri. (2016). Analysis of Knowledge, Attitudes, and Prevalence of Hepatitis B and C Seromarkers among Barbers in Tehran. *Hepat Mon*. 2016 September; 16 (9): e39416. doi: 10.5812/hepatmon.39416.
- [31] Mohamed Mutocheluh &, Kwaku Kwarteng (2015). Knowledge and occupational hazards of barbers in the transmission of hepatitis B and C was low in Kumasi, Ghana. *Pan African Medical Journal*. 2015; 20: 260 doi: 10.11604/pamj.2015.20.260.4138.
- [32] Abubakar AA, Dangana IA, John BA, Gobir AA, Ibrahim MS, Umar AA. *Perceptions and practices related to health hazards of patronizing traditional nail cutters and barbers among market men in Samaru – North Western Nigeria*. *Sub-Saharan Afr J Med* 2017; 4: 37-42.
- [33] Prince Adoba, Stephen Kyei Boadu, Hope Agbodzakey, Daniel Somuah, Richard Kobina Dadzie Ephraim and Enoch Anto Odame *High prevalence of hepatitis B and poor knowledge on hepatitis B and C viral infections among barbers: a cross-sectional study of the Obuasi municipality, Ghana* *BMC Public Health* (2015) 15: 1041 DOI 10.1186/s12889-015-2389-7.