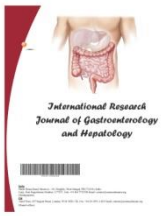

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Hepatitis B and C Status and Associated Risk Factors among Migrant Female Head Porters [*Kayayei*] within La-Nkwantanang Madina Municipality, Ghana

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Authors' contributions

This work was carried out in collaboration among all authors. Authors LQ, YA, PPMD, SBB and OS designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors LQ, YA, SBB and MB managed the analyses of the study. Authors YA, PPMD, MB and OS managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Aim: This study was conducted to determine the knowledge, prevalence and associated risk factors of viral hepatitis among migrant female head porters (Kayayei) in La-Nkwantanang Madina municipality of the Greater Accra region, Ghana.
Study Design: A descriptive cross-sectional study was conducted.
Place and Duration of Study: The study was carried out at three market centers [Atima, La-Nkwantanang and Madina markets] within the La-Nkwantanang Madina municipality of the Greater Accra region, Ghana.
Methodology: A total of 125 kayayei residing and working in La-Nkwantanang Madina municipality were included at the time of the study. A semi-structured questionnaire and focus group discussions were adopted to collect demographic and knowledge data while blood samples were drawn from each participant for hepatitis B and C assays.

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Results: Results from the study shows, prevalence of hepatitis B was 7.2% and that for hepatitis C was 6.4% respectively. One (0.8%) person was co-infected with hepatitis B and C virus. Majority (73.6%) of kayayei had no knowledge on viral hepatitis and its spread with risk factors associated with hepatitis virus were; unprotected sexual intercourse (OR = 2.93, 95% CI = 1.032-8.288) and multiple sexual partners (OR = 5.23, 95% CI = 1.302-21.02).
Conclusion: Viral hepatitis infection is common among kayayei and the level of knowledge of this disease is low. The study recommends; regular sensitization on adolescent and reproduction health among these vulnerable group and educational programs on negative the effects of child labour extended to parents in northern Ghana to discourage their daughters from migrating to the cities for head porterage but rather stay in school. Again, future research prospects can look at prevalence of comorbidity of HIV and Hepatitis as well as human papillomaviruses (HPVs) among these vulnerable group.

Keywords: Hepatitis b and c infection; female head porter (Kayayei); prevalence; Ghana.

ABBREVIATIONS

HBV – Hepatitis B virus; HBsAg – Hepatitis B surface antigen; HBcAb – Hepatitis B core antibody; HCV – Hepatitis B virus; HIV/AIDS – Human Immuno-deficiency virus/Acquire Immuno-deficiency Syndrome; STIs – Sexual transmitted infections; USA – United State of America; WHO – World Health Organization; Kayayo (plural: Kayayei) - a teenage girl or woman who carries people's loads for a fee; HBV Positive result - was reported for hepatitis B viral infection if there was presence of HBsAg or HBcAb or both per the manufacturer protocol; HCV positive result - was defined by the presence of anti-HCV antibodies per the manufacturer protocol.

1. INTRODUCTION

Head portering is an economic activity normally seen in major cities in Ghana such as Accra, Kumasi and Sekondi-Takoradi and it is characterized by carrying of goods for traders or shoppers in and around the business centres for a negotiated fee [1,2]. This economic activity is carried out mostly by young girls with few adults from disadvantaged areas, mostly in the northern part of Ghana with the intention of improving their livelihood and that of their families. Hence, they migrate to the cities, living and working under deplorable conditions [3].

In Ghana, each city has a name for these migrant female head porters. In Kumasi, these migrants are called '*paao-paa'* [4,5] while in Accra, they are known as *Kayayei*. The etymology of the word *Kaya* is a Hausa word meaning 'load' or 'goods' and '*Yoo'* is a Ga (language spoken by indigenes in Accra) word referring to 'a female'; thus '*Kayayoo' (plural: Kayayei)* refers to a teenage girl or woman who carries people's loads for a fee [5,6].

Migrants are particularly vulnerable to health problems [7]. More studies have shown that migration can result in changes in health conditions. For example, immigrants may experience changes in health status related to exposure to new infectious diseases, barriers to accessing health care upon arrival in a new destination and social networks (example new sex partners) [8,9].

In Ghana, majority of head porters are females [5] and the conditions in which these females live and work are not conducive for healthy development. Opare [5] also reported that, there is poor public and environmental health in both residential and market areas endangering the health of many informal workers especially *kayayei*. There is a heightened risk of acquiring various health diseases such as malaria, cholera or other diseases [5,10,11] which could significantly influence the health and wellbeing of these porters. Spending nights in the open and at market centres increases their vulnerability to sexual exploitation, abuse and put them at higher risk of sexually transmitted infections (STIs) such as viral hepatitis (HBV and HCV) and HIV/AIDS and unintended pregnancies.

Head porting is linked with many socio-demographic disadvantages; minority status, low income and low educational level. Away from support from home, communities and families, most migrant female head porters end up living in structures with very poor conditions that are of low standard usually found in market places and slums. Overcrowding is accepted among these girls in order to keep living expenses at a minimum [12]. Group renting is common where about 5 to 10 women rent a room without sanitation facilities, water or bath places [13]. These places are congested and poorly

ventilated and can facilitate the transmission of viral hepatitis through bodily secretions, such as saliva, sweat, urine as well as blood and blood products [14]. Sharing of items such as combs, razors, hair brushes, utensils is common among people who live in groups and this can facilitate transmission of the viruses.

The need for accommodation forces some girls to sleep with men for shelter, others also enter into sexual relationship with their male counterparts in order to get monetary support [1] [15]. Having unprotected sex especially with persons with multiple sex partners exposes them to sexually transmitted diseases including HBV and HCV.

Viral hepatitis (HBV and HCV) are bloodborne diseases, that are transmitted either by percutaneous or mucous membrane contact with infected blood or other body fluids. The virus is found in highest concentration in the blood and serous exudates. The primary routes of transmission are perinatal, early childhood exposure, sexual contact and percutaneous exposure to blood or body fluids (thus; injections, needle stick, blood transfusion). Viral hepatitis during pregnancy is associated with high risk of maternal complications. There is a high rate of vertical transmission causing fatal and neonatal hepatitis which can have serious effects on the neonate, leading to impaired mental and physical health later in life [16]. Most perinatal infections occur among infants of pregnant women or mother to child transmission [17].

Hepatitis B virus (HBV) epidemic affects mostly the WHO African Region and the Western Pacific Region while HCV epidemic affects all regions with major differences between and within countries [18]. Hepatitis B and C leads to progressive liver fibrosis, cirrhosis and an increased risk of liver cancer [19]. Hepatitis B virus prevalence is highest in sub-Saharan Africa and East Asia with 5-10% of the adult population chronically infected but the prevalence of hepatitis C virus varies from 0.2%-40% [20]. In Ghana, HBV prevalence is estimated at >10% among blood donors [21] and 15.6% among children in the general population [7].

Societal ignorance about HBV and HCV limits the potential for prevention and treatment efforts to bring these diseases under control. The head porters do not seek medical help for ailments, instead they ignore their symptoms and self-medicate when ill [22]. This can contribute to ineffective prevention and control of morbidity and mortality related to their health [23]. Lack of knowledge and awareness of HBV and HCV infection and associated risk among *kayayei* may have serious consequences on them and their families. Once infected, they may be unaware of their infection to get the appropriate medication and so run the risk of unknowingly infecting others. Several studies have reported the prevalence of HBV and HCV infections among different risk groups, however there is no published data on the knowledge and awareness of viral hepatitis, prevalence and associated risk factors among female head porters in Ghana. Hence, the study seeks to ascertain that objective in La-Nkwantanang Madina municipality of Greater Accra region of Ghana.

2. MATERIALS AND METHODS

2.1 Study Sites

The study was carried out at three (3) markets; Atima [number of participants = 32], La-Nkwantanang [number of participants = 40] and Madina market [number of participants = 53] within the La-Nkwantanang Madina municipality of the Greater Accra region, Ghana.

2.2 Study Design

This descriptive cross-sectional study was conducted among female head porters (*Kayayei*) between January - June 2019.

2.3 Sample Size

The up-to-date information on the number of migrate female head porters in the Municipality was lacking. However, Madina *Kayayei* Youth Association had a crude number of 437 females of which a total of 125 voluntarily took part in this study.

2.4 Sampling Technique

A purposive and simple random sampling techniques was employed. Purposive sampling was used to select locations of Atima, La-Nkwantanang and Madina markets because they are the largest market centers within the municipality with intense head-portering activities. Simple random sampling was used to select migrant female head porters and among them, questionnaires were distributed randomly of which each participant had equal chance of being selected.

2.5 Data Collection

2.5.1 Questionnaires pre-testing

Questionnaires used for this study were pre-tested among 10 migrant female head porters in Accra central market in order to change the instructions that were not clear to the participants.

2.5.2 Administering of questionnaires

Data was collected using a thirty-five item pre-coded semi-structured questionnaire and focus group discussions. The questionnaires were developed after reviewing published literature on knowledge, awareness and prevalence of HBV and HCV infections in Ghana and other parts of the world. The questionnaires were developed to cover socio-demographic characteristics, residential status, knowledge of hepatitis B and C infections, number of years as a head porter, number of sexual partners, blood transfusion history and extra-ear/nose piercing and/or tattoos.

Focus group discussions were employed to capture the wide range of experiences of the participants regarding the travel history, accommodation, income issues, sexual activity and reproductive health. The focus group discussions allowed participants to express their personal views, knowledge and experiences concerning accommodation and reproductive health in the work setting. The focus group discussions consisted of averagely eight participants who were at different places within the three market centres. A discussion guide led the focus group discussions. All focus group discussions were audio-taped and transcribed verbatim. Each of the discussions lasted a duration of 45 minutes on average.

2.6 Blood Sample Collection and HBV and HCV Testing

Venous blood sample (3 milliliters) was collected aseptically from each participant into a serum separator tube labelled with a unique identification number that corresponding to the questionnaire code. The serum was separated from the blood cells by centrifugation at 3000rpm for 5 minutes. The sera were tested for HBV and HCV using hepatitis B Profile test kit with sensitivity of >99.0% and specificity of 98.8% and anti-HCV rapid test strips with sensitivity of >99.0% and specificity of 98.6% (DiaSpot Diagnostics, USA). Positive result was reported for hepatitis B viral infection if there was presence of HBsAg or HBcAb or both per the manufacturer protocol. For hepatitis C viral infection, positive result was defined by the presence of anti-HCV antibodies per the manufacturer protocol. Positive and negative control for HBV and HCV samples were tested alongside test samples to validate the test kits to ensure quality results.

2.7 Statistical Analysis

Data were entered into Microsoft excel version 16 and exported to GraphPad prism version 6.1 (www.graphpadprism.com) for analyses. There were 19 questions on knowledge of hepatitis B and C and this was assessed and quantified using a scoring system adopted by Osei, [24] where a value of zero is assigned to each wrong knowledge item and one for a correct knowledge item. Knowledge score of 10 – 19 was considered good knowledge and a score of less than 10 was classified as having poor knowledge. Data were presented as frequency (number), percent and chart. Categorical variables were compared using chi-square test. Bivariate and multivariate logistic regression analysis was used to assess risk factors associated with hepatitis viral infection and in all comparison, a p-value <0.05 was considered statistically significant.

3. RESULTS

3.1 Socio-demographic Characteristics of Study Participants

A total of 125 *Kayayei* were sampled from their residential locations of Atima, La-Nkwantanang and Madina markets. As shown in Table 1, majority (60.8%) had no formal education, were Muslims (96.8%) and from the North-East region (63.2%) of Ghana. Furthermore, 41% were not married with 7.2% being single mothers during their stay in Accra and of the age grouping, more (52%) were between the ages 15 – 24 years.

3.2 Prevalence of Hepatitis Viral Infection

The prevalence of hepatitis B viral infection defined by the presence of HBsAg and/or HBcAb was 7.2% and that of hepatitis C viral infection defined by the presence of anti-HCV antibodies was 6.4%. The study recorded one (1) person who was seropositive for both markers (Fig. 1).

3.3 Distribution of Socio-demographic Characteristics and Hepatitis B and C Status

As shown in Table 2, more of head porters who were positive for hepatitis B were between the ages 20 – 24 years (44.4%), single (55.6%) with no child (44.4%), had no formal education (44.4%) and were from North-East region (77.8%).

Table 1. Socio-demographic characteristics of study participants

Variable	Number	Percent (%)
Age (years)		
< 15	7	5.6
15-19	32	25.6
20-24	33	26.4
25-29	16	12.8
30-34	9	7.2
>34	28	22.4
Education Status		
No formal education	76	60.8
Primary/JHS	34	27.2
Secondary/Vocation	15	12.0
Marital status		
Single	51	40.8
Married	74	59.2
Number of children		
Single		
no child	42	33.6
1 child	7	5.6
>1 child	2	1.6
Married		
no child	0	0
1 child	20	16.0
>1 child	54	43.2
Religion		
Christian	4	3.2
Muslim	121	96.8
Region		
Northern	39	31.2
North-East	79	63.2
Savana	7	5.6

Data presented as absolute value and percent

Majority of participants who were positive for hepatitis C were between the ages of 20 – 24 (37.5%) and 30 – 34 (37.5%) years, married (62.5%) with more than one (1) child (50.0%), had no formal education (75.0%) and were all from North-East region of Ghana (Table 2).

3.4 Association between Selected Variables and Knowledge of Hepatitis B and C Infection

From the study, majority 92(73.6%) of participants had no knowledge of the hepatitis B and C infection/disease. A significant (p=.01) number (62%) of those who had no knowledge of hepatitis viral infection had work as a head porter for <1 year compared with 30.3% who had knowledge. However, head porters who had lived and worked in Accra for more than 2 years (45.5%) were aware of hepatitis virus than their counterparts (22.8%) with no knowledge.

Table 2. Distribution of socio-demographic characteristics and hepatitis B and C status

Variable	HBsAg positive	HCV positive
	n=9 (%)	n=8 (%)
Age (years)		
< 15	0 (0.0)	1 (12.5)
15-19	1 (11.1)	1 (12.5)
20-24	4 (44.4)	3 (37.5)
25-29	0 (0.0)	0 (0.0)
30-34	1 (11.1)	0 (0.0)
35 and above	3 (33.4)	3 (37.5)
Education Status		
No formal education	4 (44.4)	6 (75.0)
Primary/JHS	2 (22.2)	1 (12.5)
Secondary/Vocation	3 (33.4)	1 (12.5)
Marital status		
Single	5 (55.6)	3 (37.5)
Married	4 (44.4)	5 (62.5)
Number of children		
Single		
no child	4 (44.4)	3 (37.5)
1 child	1 (11.1)	0 (0.0)
>1 child	0 (0.0)	0 (0.0)
Married		
no child	0 (0.0)	0 (0.0)
1 child	0 (0.0)	1 (12.5)
>1 child	4 (44.4)	4 (50.0)
Region		
Northern	2 (22.2)	0 (0.0)
North-East	7 (77.8)	8 (100.0)
Savana	0 (0.0)	0 (0.0)

Data presented as absolute value (percent)

For age and knowledge of hepatitis status, more (27.3%) within the age group 25-29 years had knowledge of hepatitis virus compared with age matched (7.6%) and this was statistically significant (p=.00). Among participants who had

knowledge of HBV and HCV, 6.1% knew of the transmission route, 15.2% had tested for hepatitis virus and 6.1% had vaccinated against hepatitis B compared with those with no knowledge. The comparison between the two groups for knowledge on transmission route of hepatitis virus, whether participants had tested for hepatitis B and vaccination against hepatitis were statistically significant ($p<0.05$) (Table 3).

3.5 Bivariate and Multi-variate Logistic Regression Analysis of Risk Factors Associated with Hepatitis B and HCV Infection

Univariate and multivariate logistic regression analysis was conducted to determine the risk factors associated with hepatitis B and C viral infection among female head porters. Variables considered were age, marital status, number of children, education, duration as head porter and medical records.

For the univariate logistic regression analysis, those who had unprotected sexual intercourse were approximately 3 times (OR=2.93, 95% CI=1.032-8.288, p=.049) more likely to get infected with hepatitis virus than those who did not have unprotected sexual intercourse. Again, the study found that, those who had multiple sexual partners were 5 times (OR=5.23, 95% CI=1.302-21.02, p=.01) more likely to get infected with hepatitis virus than those who did not have sexual partner at all. Furthermore, those who had only one sexual partner was 0.7 times (OR=0.31, 95% CI=0.108-0.8796, p=.02) less likely to get infected with hepatitis virus than those with no sexual partner (Table 4).

After adjusting for unprotected sexual intercourse, those who had multiple sexual partners were 5 times (aOR=5.28, 95% CI=1.303-21.09, p=.01) more likely to get infected with hepatitis B and C virus than those who did not have a sexual partner. Also, those who had only one sexual partner were 0.8 times (aOR=0.27, 95% CI=0.045-1.000, p=.049) less likely to get infected with hepatitis virus than those with no sexual partner (Table 4).

4. DISCUSSION

Migrant female head porters (*Kayayei*) face several socioeconomic challenges including exploitation by customers, violence, assault, verbal abuse and sexual harassment [25]. This may be attributed to the fact that, most *Kayayei* work and seek shelter at markets places, in front of stores, bus stations or on the streets, exposing them to the risk of sexual abuse or rape [1,10].This may lead to increased chances of teenage pregnancy or the spread of sexual transmitted diseases like HIV/AIDS or viral hepatitis (HBV and HCV), which has the potential of affecting the health of the mother and that of their babies.

The findings from this study show that, most *Kayayei* were of child bearing age, 8.2% being single mothers and 59.2% married with a child or at least two children. From the study, 73% female head porters interviewed attested to ever had sexual intercourse, 8% refused to respond while 19% responded that, they never had sexual intercourse. This finding agrees with the study by Shamsu-Deen [15] who reported similarly high number (84%) of *Kayayei* admitting to ever had sexual intercourse. This implies, more of the head porters were exposed to sexual activities and that may predispose them to teenage pregnancy or sexual transmitted infections (STIs) including viral hepatitis or HIV/AIDS.

The study found a prevalence of hepatitis B viral infection to be 7.2% and hepatitis C to be 6.2% with one person (0.8%) co-infected. These prevalence of hepatitis infections were high compared with 5% for HBV and 0.2% for HCV infection in the sub-Saharan Africa and East Asia of by WHO (2016). Hepatitis (HBV and HCV) infections can be acquired through sexual intercourse with an infected person, sharing of infected objects (such as needles, injectables, razors/shaving blades etc) or through transfusion of contaminated blood or blood products. Once majority (73%) of the study participants were exposed to sexual activity, this may have accounted for the high prevalence of hepatitis infection.

Education is known to be an important determinant of health [26] and higher levels of educational attainment is found to be associated with improved maternal and infant health outcomes [27], adolescent health [28] and reduced morbidity and mortality [29]. It was observed that, majority of those infected with hepatitis B and C in this study had no formal education. More participants, had no knowledge of hepatitis viral infection and a significant number (62%) of participants who had no knowledge of the viral infection had work as head porters for less than a year. The implication may be that, they could be engaging in risky sexual behaviors and cultural practices such as

tattooing and sharing of sharp materials which are common among uneducated people [30] as well as ear piercing and scarification which are common among *Kayayei*. This may increase their risks of acquiring viral hepatitis.

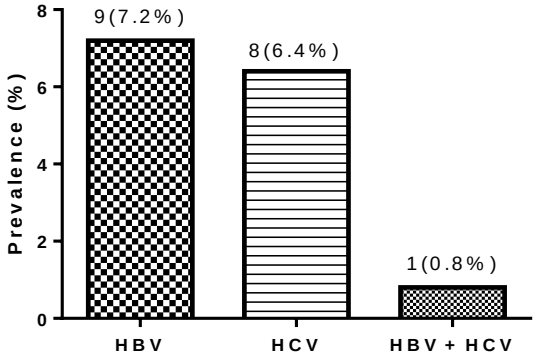

Fig. 1. Prevalence of hepatitis B and C

Table 3. Association between selected variables and knowledge of hepatitis status

Variable	Knowledge of hepatitis B and C infection		P-value
	Yes, n=33 (%)	No, n=92 (%)	
Age (years)			
< 15	0 (0.0)	7 (7.6)	.10
15-19	6 (18.2)	26 (28.3)	.25
20-24	11 (33.3)	22 (23.9)	.29
25-29	9 (27.3)	7 (7.6)	**.00****
30-34	3 (9.1)	6 (6.5)	.62
35 and above	4 (12.1)	24 (26.1)	.09
Education Status			
No formal education	16 (48.5)	60 (65.2)	.09
Primary/JHS	10 (30.3)	24 (26.1)	.64
Secondary/Vocation	7 (21.2)	8 (8.7)	.06
Marital status			
Single	12 (36.4)	39 (42.4)	.55
Married	21 (63.6)	53 (57.6)	
Child bearing			
Yes	25 (75.8)	57 (62.0)	.15
Duration as head porter			
<1 year	10 (30.3)	51 (62.0)	**.01***
1--2 years	8 (24.2)	20 (21.7)	.76
>2 years	15 (45.5)	21 (22.8)	**.01***
Tested for Hep. B			
Yes	5 (15.2)	0 (0.0)	**.00***
Tested for Hep. C			
Yes	0 (0.0)	0 (0.0)	NA
No	33 (100.0)	92 (100.0)	
Exposure to one or more transmission modes			
Yes	2 (6.1)	0 (0.0)	**.02***
Received Blood transfusion			
Yes	2 (6.1)	6 (6.5)	.93
Vaccination against hepatitis			
Yes	2 (6.1)	0 (0.0)	**.02***

Data presented as absolute value (percent). Categorical variable compared using Chi-square test [p<0.05 considered statistically significant]

Table 4. Bivariate and multi-variate logistic regression analysis of risk factors associated with hepatitis B and C

Variable	Infected, n=18(%)	Not infected, n=107(%)	OR (95%CI)	P-value	aOR (95%CI)	P-value
Age (years)						
< 15	1 (5.6)	6 (5.6)	1.26(0.114-10.511)	.94	1.36(0.126-14.643)	.80
15-19	4 (22.2)	28 (26.2)	0.50(0.163-2.841)	.60	0.81(0.172-3.796)	.79
20-24	5 (27.6)	28 (26.2)	1.17(0.340-4.055)	.80	1.33(0.359-4.933)	.67
25 and above	8 (44.4)	45 (42.1)	1.0		1.0	
Education Status						
No formal education	11 (61.1)	65 (60.7)	1.09(0.368-3.206)	.88	1.01(0.331-3.058)	.99
Educated	7 (38.9)	42 (39.3)	1.0		1.0	
Marital status						
Single	8 (44.4)	43 (40.1)	1.0		1.0	
Married	10 (55.6)	64 (59.9)	2.16(0.763-6.110)	.14	2.36(0.872-6.513)	.16
Number of sexual partners						
None	7 (38.9)	27 (25.2)	1.0		1.0	
One	7 (38.9)	74 (69.2)	0.31(0.108-0.8796)	.02*	0.27(0.045-1.000)	.049*
More than one	4 (22.2)	6 (5.6)	5.23(1.302-21.02)	.01*	5.28(1.303-21.09)	.01*
Duration as head porter (year)						
<1	8 (44.4)	53 (49.5)	1.0		1.0	
1-2	4 (22.2)	24 (22.4)	0.80(0.194-3.255)	.75	0.75(0.179-3.096)	.69
>2	6 (33.3)	30 (28.1)	1.07(0.321-3.555)	.91	1.08(0.324-3.613)	.90
Blood transfusion						
Yes	2 (11.1)	6 (5.6)	2.45(0.450-13.356)	.30	2.70(0.483-15.084)	.26
No	16 (88.9)	101 (94.4)	1.0		1.0	
Number of co-habitants						
1 - 2	2 (11.1)	13 (12.1)	1.0		1.0	
>2	16 (88.9)	94 (87.9)	1.03(0.212-5.030)	.97	1.01(0.206-4.932)	.99
Unprotected sex						
Yes	10 (55.6)	30 (28.1)	2.93(1.032-8.288)	.04*	1.0	
No	8 (44.4)	77 (71.9)	1.0		1.0	
Extra-ear/nose piercing/tattoo						
Yes, done in Madina	8 (44.4)	43 (40.2)	1.15(0.398-3.314)	.80	1.16(0.400-3.344)	.79
No	10 (55.6)	64 (59.2)	1.0		1.0	

Data presented as number (percent); OR – odd ratio, aOR – adjusted odd ratio, 95% CI – 95% confidence interval, p-value < 0.05 considered statistically significant

Ziblim [1] reported high knowledge of sexually transmitted infection among *kayayei* in Accra central markets (Makola, Agbobloshei, Mallam Atta, Tudu, and Tema lorry station markets). However, the knowledge and awareness of hepatitis B and C among *Kayayei* in this study was low (26.4%) and among this group, only 6.1% knew of the transmission route, 15.2% had tested for hepatitis virus and 6.1% had vaccinated against hepatitis B of which 45.5% had worked as head porters for more than 2 years. The observed difference may be that, in Ziblim's study, the female head porters attested to been sensitized on HIV/AIDS and other sexual and reproductive health related issues by some Non-Government Organizations (NGOs) and this may have accounted for the high knowledge of HIV/AIDS in his study [1]. However, a focus group discussion with the female head porters shows that, they have never been sensitized on STIs prior to this study. The low level of knowledge and awareness of viral hepatitis (HBV and HCV) in this study is in line with other studies conducted in Ghana among pregnant women in the Kintampo North Municipality [31] and the general populace of the Upper West region [32].

For determinants of viral hepatitis among female head porters, the study found that, *Kayayei* who had ever had unprotected sexual intercourse with their male counterparts and those who had multiple sexual partners were more at risk of getting infected with the virus (HBV and HCV). These findings agree with other studies carried out in the United States [33], China [34] and South-Western Greece [35] that, individuals who had unprotected sexual contacts with an infected partner or had multiple heterosexual partners were more at risk of contracting the viral hepatitis (HBV and HCV).

Another observation made in this study was that one person within the 20-24 years group was seropositive for both HBsAg and anti-HCV. Her identified risk factor was having two siblings; one belonging to the 15-19 years group and the other in the 20-24 years group tested positive for anti-HCV. Thus, having siblings who are infected with either one of these two viral infections could be a risk factor in the studied population. These infected individuals could have acquired the infection either through vertical and/ or horizontal transmission. In highly endemic countries like Ghana, infection with hepatitis B viruses occurs during childhood with majority of such infections being a combination of vertical transmission at birth from a chronically infected mother to her new born and horizontal transmission from unsanitary conditions in childhood [36,37]. Perinatal (vertical) acquisition of HCV is the most common mode of transmission in childhood with an estimated 5% of infants born to mothers with HCV viremia acquiring the infection through this route [38].

Accommodation has been one of the major challenge migrants all over the world face [39,40]. In this study, more (53%) of the participant in all the three market centers of the municipality responded that, they sleep in front of stores in the markets while others seek shelter at uncompleted buildings and wooden structures around them. The lack of proper accommodation exposes them to not only the weather or mosquito bites (malaria) but also theft and sexual assaults. Communicating with 18 years old *kayayo* at the La-Nkwantanang market on theft issues, she reported that;

> *My friends and I store our items bought from our kaya money with one (Mr. Imoro) who has a big kiosk in the market. When it was time for me to go back to the north, I went to him for my items only to be told that, thieves broke into that kiosk and stole our items. Although there was no sign that shows that the kiosk was broken, he still insisted that, it was broken and that, I should take him to wherever I could. We, kayayei are always exploited, assaulted and harassed because we don't know any one and no one is there to fight for us. I (*18-year girl*) had to stay for another year to gather them again because I will need them when I marry.*

Again, an interaction with a 16-year-old *Kayayo* from Madina market on sexual life, she reported that;

> *We usually sleep in front of this store (pointing to one of the stores in the market) but it was raining very heavily that day and I followed my friend (anonymous) to her boyfriend's wooden structure. He was there with his young male friend, (anonymous). That night while my friend was sleeping with her boyfriend, the young man (anonymous) came to have sexual intercourse with me. At first, I didn't want to do it since it was my first time of seeing him but three of them threatened to throw me out. I finally agreed to have sex with him (anonymous) and that is how I lost my virginity.*

Shamsu-Deen [15] reported that, migrant porters usually have no accommodation and this exposes them to rape while other porters will exchange sex for shelter. This may predispose them to sexual transmitted infection such hepatitis (HBV and HCV) infections or HIV/AIDS.

5. CONCLUSION

Hepatitis B and C viral infections are common among female head porters and the knowledge and awareness levels of these viral infections is low (26.4%). *Kayayei* who had unprotected sexual intercourse and those with multiple sexual partners are at risk of getting infected with viral hepatitis. Therefore, the study recommends that, reproductive health program and sensitization on adolescent health should be carried out regularly among these vulnerable groups so as to reduce teenage pregnancies and sexual transmitted infections (STIs) such as hepatitis B and C and/or HIV/AIDs. Also, educational programs on the negative effects of child labour should be extended to parents in northern Ghana to discourage their daughters from migrating to the cities for head porterage and rather to stay in school. Again, future research prospects can look at prevalence of comorbidity of HIV and Hepatitis as well as human papillomaviruses (HPVs) among these vulnerable group.

6. LIMITATIONS

The study had the following limitations; the year and time of exposure to viral hepatitis B and C was not captured so the study could not establish whether those who were positive were exposed before they got to the city (Accra) or after. The pre-coded semi-structured questionnaire did not include drug addicts or intra venous drug abusers. Again, the use of anti HCV ELISA will have detected more false positive results than Anti HCV rapid test strip.

CONSENT

Informed consent was sought from Madina Kayayei Youth Association as well as each participant before inclusion in the study. The target population were female head porters of all ages residing and working within the La-Nkwantanang Madina municipality. *Kayayei* who declined to consent/take part in the study and those who were absent during our visit were excluded from the study.

ETHICAL APPROVAL

The research was approved by the Ethical review board of the School of Allied Health Science, University for Development Studies.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Ziblim SD. Following the trails of the mother: Migration and reproductive health nexus-a case study of female porters in Accra. The Experiment. 2013;16(4):1145–59.
2. Yeboah MA, Appiah-Yeboah K. An examination of the cultural and socio-economic profiles of porters in Accra, Ghana. Nordic Journal of African Studies. 2009;18(1):21.
3. Dery DB, Brown C, Asante KP, Adams M, Dosoo D, Amenga-Etego S, et al. Patterns and seasonality of malaria transmission in the forest-savannah transitional zones of Ghana. Malaria Journal. 2010;9(1):314.
4. Baah-Ennumh TY, Adoma MO. The living conditions of female head porters in the Kumasi metropolis, Ghana. Journal of Social and Development Sciences. 2012; 3(7):229-44.
5. Opare JA. Kayayei: The women head porters of southern Ghana. Journal of social development in Africa. 2003;18(2).
6. Yeboah MA. Urban poverty, livelihood, and gender: Perceptions and experiences of porters in Accra, Ghana. Africa Today. 2010;56(3):42-60.
7. Dongdem JT, Kampo S, Soyiri IN, Asebga PN, Ziem JB, Sagoe K. Prevalence of hepatitis B virus infection among blood donors at the Tamale Teaching Hospital, Ghana (2009). BMC Research Notes. 2012;5(1):115.

8. Golden M. Transport proteins as indices of protein status. The American Journal of Clinical Nutrition. 1982;35(5):1159-65.
9. Afari E, Appawu M, Dunyo S, Baffoe-WilmotA, Nkrumah F. Malaria infection, morbidity and transmission in two ecological zones Southern Ghana. African Journal of Health Sciences. 1995;2(2):312-5.
10. Kwankye SO, Anarfi JK, Tagoe CA, Castaldo A. Coping strategies of independent child migrants from northern Ghana to southern cities. Development Research Centre on Migration, Globalisation and Poverty Working Paper Series, University of Sussex; 2007.
11. Shamsu-Deen Z. Migration and Health among Female Porters (Kayayei) in Accra, Ghana: University of Ghana; 2015.
12. Kochar D, Agarwal P, Kochar S, Jain R, Rawat N, Pokharna R, et al. Hepatocyte dysfunction and hepatic encephalopathy in *Plasmodium falciparum* Malaria. QJM. 2003;96(7):505-12.
13. Mahama C, Antwi A, editors. Land and property markets in Ghana. World Urban Forum; 2006.
14. Candan F, Alagözlü H, Poyraz Ö, Sümer H. Prevalence of hepatitis B and C virus infection in barbers in the Sivas region of Turkey. Occupational Medicine. 2002; 52(1):31-4.
15. Shamsu-Deen Z. Migration and health nexus: A case of female porters (Kayayei) in Accra, Ghana. Research on Humanities and Social Sciences. 2013;3(3):103-9.
16. Osazuwa F, Victor Obinna O, Favour Chika A. Nijerya Abaji Bölgesi Kırsal Toplumunda, Gebe Kadınlar Arasında, İnsan İmmün Yetmezlik Virüsü, Hepatit B ve C Sero-epidemiyolojisi. TAF Preventive Medicine Bulletin. 2012;11(4).
17. Ott J, Stevens G, Groeger J, Wiersma S. Global epidemiology of hepatitis B virus infection: New estimates of age-specific HBsAg seroprevalence and endemicity. Vaccine. 2012;30(12):2212-9.
18. World Health Organization. Global hepatitis Report, 2017; 2017.
19. Schweitzer A, Horn J, Mikolajczyk RT, Krause G, Ott JJ. Estimations of worldwide prevalence of chronic hepatitis B virus infection: A systematic review of data published between 1965 and 2013. The Lancet. 2015;386(10003):1546-55.
20. World Health Organization. WHO Global Health Sector Strategy on Viral Hepatitis 2016-2021 Towards Ending Viral Hepatitis; 2016.
21. Walana W, Ahiaba S, Hokey P, Vicar EK, Acquah SEK, Der EM, et al. Sero-prevalence of HIV, HBV and HCV among blood donors in the Kintampo Municipal Hospital, Ghana; 2014.
22. Anarfi JK. Vulnerability to sexually transmitted disease: Street children in Accra; 1997.
23. Ellis AA, Traore S, Doumbia S, Dalglish SL, Winch PJ. Treatment actions and treatment failure: Case studies in the response to severe childhood febrile illness in Mali. BMC Public Health. 2012;12(1): 946.
24. Osei E, Niyilapah J, Kofi Amenuvegbe G. Hepatitis B Knowledge, Testing, and Vaccination History among Undergraduate Public Health Students in Ghana. BioMed research international. 2019;2019.
25. International Labour Organization. Global Alliance Against Forced Labour. ILO, Geneva; 2005.
26. Albert C, Davia MA. Education is a key determinant of health in Europe: A comparative analysis of 11 countries. Health Promotion International. 2010; 26(2):163-70.
27. Chou T-C. Drug combination studies and their synergy quantification using the Chou-Talalay method. Cancer Research. 2010;70(2):440-6.
28. Viner RM, Ozer EM, Denny S, Marmot M, Resnick M, Fatusi A, et al. Adolescence and the social determinants of health. Lancet. 2012;379(9826):1641-52.
29. Baker JK, Seltzer MM, Greenberg JS. Longitudinal effects of adaptability on behavior problems and maternal depression in families of adolescents with autism. Journal of Family Psychology. 2011;25(4):601.
30. Biadgo B, Shiferaw E, Woldu B, Alene KA, Melku M. Transfusion-transmissible viral infections among blood donors at the North Gondar district blood bank, northwest Ethiopia: A three year retrospective study. PloS One. 2017;12(7):e0180416.
31. Abdulai MA, Baiden F, Adjei G, Owusu-Agyei S. Low level of Hepatitis B knowledge and awareness among pregnant women in the Kintampo North Municipality: implications for effective disease control. Ghana Medical Journal. 2016;50(3):157-62.

32. Mkandawire P, Richmond C, Dixon J, Luginaah IN, Tobias J. Hepatitis B in Ghana's upper west region: A hidden epidemic in need of national policy attention. Health & Place. 2013;23:89-96.
33. Alter MJ, Coleman PJ, Alexander WJ, Kramer E, Miller JK, Mandel E, et al. Importance of heterosexual activity in the transmission of hepatitis B and non-A, non-B hepatitis. JAMA. 1989;262(9):1201-5.
34. Deng Q, Pan Y, Wang C, Li F, Lv S, Hu S, et al. Prevalence and risk factors for hepatitis B in Hua County, Henan Province. Beijing da xue xue bao Yi xue ban= Journal of Peking University Health sciences. 2013;45(6): 965-70.
35. Gogos C, Fouka K, Nikiforidis G, Avgeridis K, Sakellaropoulos G, Bassaris H, et al. Prevalence of hepatitis B and C virus infection in the general population and selected groups in South-Western Greece. European Journal of Epidemiology. 2003; 18(6):551-7.
36. Kane M. Global programme for control of hepatitis B infection. Vaccine. 1995;13: S47-S9.
37. Dzidzinyo K. Factors Associated With Hepatitis-B Infection Among Krachi Senior High School Students In The Krachi West District Of The Volta Region: University of Ghana; 2017.
38. Yazigi N, Balistreri W. Viral Hepatitis In Kliegman RM, Behrman RV, Jenson HB, Stanton F. Nelson Textbook of Pediatric 18thed. Philadelphia WB Saunders; 2007.
39. Roberts A. Peripheral accumulation in the world economy: A cross-national analysis of the informal economy. International Journal of Comparative Sociology. 2013; 54(5-6):420-44.
40. Hilson G. Creating rural informality: The Case of Artisanal Gold Mining in Sub-Saharan Africa. SAIS Review of International Affairs. 2013;33(1):51-64.

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