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Rate of Full Hepatitis B Vaccination and its Associated Factors among Medical Workers in Jinja Regional Referral Hospital Jinja District, Eastern Uganda

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ABSTRACT

Hepatitis stands for "inflammation of the liver" and five types of viruses can cause viral hepatitis. Hepatitis B virus (HBV) is a virus that only can infect humans and today 240 million people are infected by chronic HBV in the world. The infectious agent in HBV is transmitted with body fluids such as blood, vaginal fluids, semen, saliva, and mucous membranes. This study was carried out to determine the rate of full hepatitis B vaccination and its associated factors among medical workers at Jinja Regional Referral Hospital, Jinja District, Eastern Uganda. A cross-sectional study design using unbiased descriptive qualitative and quantitative approaches was done to determine the rate of full hepatitis B vaccination and its associated factors among medical workers at Jinja Regional Referral Hospital, Jinja District, Eastern Uganda. A sample of 245 medical workers was recruited for the study. Majority 125(51.0%) were aged 18-35 years, 109(44.5%) were Basoga by tribe, many 92(37.6%) were catholic, many 105(43.8%) were of diploma level of education, and lastly majority 157(64.1%) were married. Only 22 (9.0%) adhered to hepatitis B vaccination i.e. got all 3 doses while 223(91%) did not adhere i.e. get the 3 doses of hepatitis B vaccination. It was found that none of the socio-demographic factors has a p-value less than 0.2. Thus, no socio-demographic factor proceeded to the multivariate analysis. The study found that family support, friends support and partner support had a p-value less than 0.2. Thus, proceeded for multivariate analysis showed family support and partner support were significantly related to full hepatitis B vaccination. Participants who were supported by their partners were 24.55 times more likely to complete the hepatitis B vaccination dose compared to those not supported by their partners. Finally, participants who were not supported by their families were 2% less likely to complete the hepatitis B vaccination dose compared to those supported by their families. The rate of full Hepatitis B vaccination was established to be low (only 9.0% adhered to full vaccination against Hepatitis B) while a substantial number of respondents (91% did not adhere to full Hepatitis B vaccination as per the guidelines) among medical workers at Jinja Regional Referral Hospital. This reflects a potential danger to medical workers who could accidentally acquire HBV infection. Therefore, the study drew recommendations that the vaccination policy on HBV should be strengthened and implemented, and follow-up strategies for those vaccinated to ensure full dose completion. There is a need to increase the availability of personal protective gear and usage by health workers for protection during contact with patients.

Keywords: Hepatitis B virus, Vaccination, Inflammation, Liver disease, medical workers, Family support.

INTRODUCTION

Hepatitis B infection is an ancient disease from the times of the Bronze Age. It had been suspected as an agent of infection in the 50s which was later reported first as an Australian antigen in the 60s and subsequently discovered under the electron microscope in the 70s. Vaccination for hepatitis B was introduced

in the 80s. Hepatitis B is a major public health problem [1, 2]. Based on the prevalence of hepatitis B surface antigen (HBsAg), different areas of the world are classified as having high (≥8%), intermediate (2%–7%), or low (<2%) HBV endemicity. Among healthcare workers (HCWs), seroprevalence is two to four times higher than that of the general population. They remain at risk of acquiring HBV infection mainly through percutaneous or mucosal exposure to infected blood or body fluids. The risk might be even greater if the HCW is a trainee, intern, or just a student as they have a lack of experience, insufficient training, or plain carelessness [3, 4]. Hepatitis B infection transmission chain can be interrupted through vaccination, using safety precautions while handling infectious material, proper sterilization of medical equipment, and legit waste handling. However, the studies have indicated that there is a clear gap in knowledge among trainees of the health profession regarding the risks of occupational exposure to HBV infection [5, 6]. Hepatitis stands for "inflammation of the liver" and five types of viruses can cause viral hepatitis. Hepatitis B (HBV) is according to the World Health Organization (WHO) the most common liver infection in the world [7]. HBV is a virus that only can infect humans and today 240 million people are infected by chronic HBV in the world. According to the World Health Organization, the mortality rate in the world due to complications of HBV per year is more than 780 000 people [8]. The infectious agent in HBV is transmitted with body fluids such as blood, vaginal fluids, semen, saliva, and mucous membranes. HBV can be transmitted from mother to child at birth (perinatal transmission), by sexual contact with an infected person, by using unclean needles, by unsafe blood transfusions and between children in early childhood [9]. The HBV has a membrane called HBsAg, under the membrane there were other marks such as HBeAg and HBcAg. These ones or their corresponding antibodies will appear in the blood samples of a person who has the infection [10]. HBV can be an acute or chronic disease. Laboratory blood tests are used to test for HBV antibodies in the blood, the tests can distinguish if it is an acute or chronic infection. In most cases among adults, the infection heals. However, about 5 %, the infection becomes chronic and causes liver inflammation [11]. According to the World Health Organization, symptoms for HBV vary, and some get the infection but have no symptoms, while others can get symptoms such as loss of appetite, abdominal pain, nausea, dark urine, acute illness, vomiting, and fatigue that can last from weeks to months. Yellowing skin and eye-whites (jaundice) can appear [12].

Hepatitis B virus (HBV) infection is a worldwide healthcare problem, especially in developing areas. Globally, over 2 billion people have been infected with HBV, and there are over 350 million carriers [13]. Acute infection of HBV can cause nonspecific symptoms or fulminant hepatitis that may cause death or require urgent liver transplantation. Chronic infection can be the cause of death associated with liver failure, cirrhosis, or hepatocellular carcinoma. Due to the severity and low survival rate of advanced-stage liver diseases even with a conventional approach, some patients resort to the use of herbal medications which most times complicate the ailment culminating in poor health outcomes. This however does not negate the importance of traditional medicine in the maintenance of health. Traditional medicine involves the use of herbs and plant products in the maintenance of good health and it is a widely acknowledged practice [14]. Notably, scientific backup of liver-protective and curative properties of some plants is well-documented [15-18]. The secondary metabolites and other chemical constituents inherent in these plants and herbs impact them with such therapeutic capacities [19, 20].

By adhering to universal precautions which include using protective barriers such as gloves, vaccination, appropriate sterilization of medical equipment, and a suitable hospital waste management system, the spread of HBV infection can be prevented [13]. Hepatitis B remains a major

global concern despite the fact that reducing its incidence is in proper progress; more has to be done in eradicating this brutal life claimer, especially in developing countries like Uganda.

Thus, this study was designed to determine the rate of full hepatitis B vaccination and its associated factors among medical workers at Jinja Regional Referral Hospital, Jinja District, Eastern Uganda.

METHODOLOGY

Area of Study

The study was conducted within Jinja Regional Referral Hospital, located in Jinja City which sits along the shores of Lake Victoria, near the source of the White Nile. The coordinates of the town are 00°25' 24" N, 33°12'14" (Latitude: 0.4233; Longitude: 33.20389), 1.2km above sea level. Jinja is boarded by Mukono district in the east, Kamuli district in the north, Iganga district in the east and Lake Victoria in the southeast.

Study Design

A cross-sectional study using unbiased descriptive qualitative and quantitative approaches was done to determine the rate of full hepatitis B vaccination and its associated factors among medical workers at Jinja Regional Referral Hospital, Jinja District, Eastern Uganda. Obtained data were used to establish the probable factors that hinder people from attaining full vaccination against hepatitis B infection.

Study Population

The study targeted a sample that was used as representative of the total enrolment of medical workers at JRRH.

Inclusion Criteria

Any medical worker who consented that he or she works in JRRH.

Exclusion Criterion

Any medical worker who did not consent and or any other medical worker who did not work at JRRH.

1Sample size determination

The sample size was determined using the Fisher formulae for determining sample size, (Daniel, 1999)

Fisher formulae

$$n = \frac{z^2 p\, q}{d^2}$$

Where;

n=sample size

z=standard deviation at 95% confidence level (1.96).

p=expected prevalence of unvaccinated medical workers (p=20%)

q=1-p

d =margin of error (d=0.05)

therefore

$$n = \frac{1.96^2 \times 0.2\,(1-0.2)}{0.05^2}$$

n= 245

Therefore, the sample size used was 245

Sampling Technique

The study was carried out among all consented sound mind medical workers working at Jinja Regional Referral Hospital. A sample size of 245 participants was selected using a simple random sampling technique.

Data Collection Tools

Data was collected with the help of a pre-tested questionnaire.

Data Collection Procedures

Data was collected using administered questionnaires, where the researcher met with the targeted respondents that took part in the study, after obtaining permission for data collection from respondents. Each participant was required to give informed consent before enrolling in the study. The researcher assisted the respondents in filling the questionnaires by explaining to the respondents for clarification. The properly filled questionnaires were then collected and then data was taken for analysis.

Reliability and Validity

The researcher fine-tuned together with the supervisor the questionnaire to remove material error to be in line with the objectives. To ensure reliability and validity of instruments, the questionnaires designed were first taken to the supervisor for comments after which they were perfected and administered.

Data Analysis

The quantitative and qualitative data collected was statistically analyzed and documented using Microsoft Excel and Word version 2007 which was then analyzed using SPSS v.16. The analyzed data was then presented in the form of tables and graphs which formed a basis for discussion and conclusion among others.

Data Presentation

Data from questionnaires were sorted, edited, and recorded for accuracy and completeness. Later on, it was analyzed using frequency distribution tables and percentages, graphs ad pie charts.

Ethical Considerations

Informed consent was sought from participants after a thorough establishment of rapport and an explanation of the purpose of the study. An introductory letter approved by IREC of Kampala International University was obtained and presented to the hospital director of JRRH for permission to conduct my research in the hospital.

RESULTS

Demographic data of respondents

Table 1: Demographic data of respondents

	Frequency	Percent (%)
Age		
18-35	125	51.0
36-59	88	35.9
60 and above	32	13.1
Tribe		
Musoga	109	44.5
Mugisu	36	37.6
Mugwere	40	16.3
Others	60	24.5
Religion		
Pentecostal	42	17.1
Catholic	92	37.6
Moslem	51	20.8
SDA	10	4.0
Anglican	47	19.2
Bishaka	3	1.1
Education level		
Certificate	71	29.0
Diploma	105	42.9
Bachelors	58	23.7
Postgraduate	11	4.5
Marital status		
Single	71	29.0
Married	157	64.1
Divorced	7	2.9
Widow	10	4.0

Table 1 shows that majority 125(51.0%) were aged 18-35 years, 109(44.5%) were Basoga by tribe, many 92(37.6%) were catholic, many 105(43.8%) were of diploma level of education, and lastly majority 157(64.1%) were married.

Number of medical workers who have attained full Hepatitis B vaccination at Jinja Regional Referral Hospital, Jinja District, Eastern Uganda.

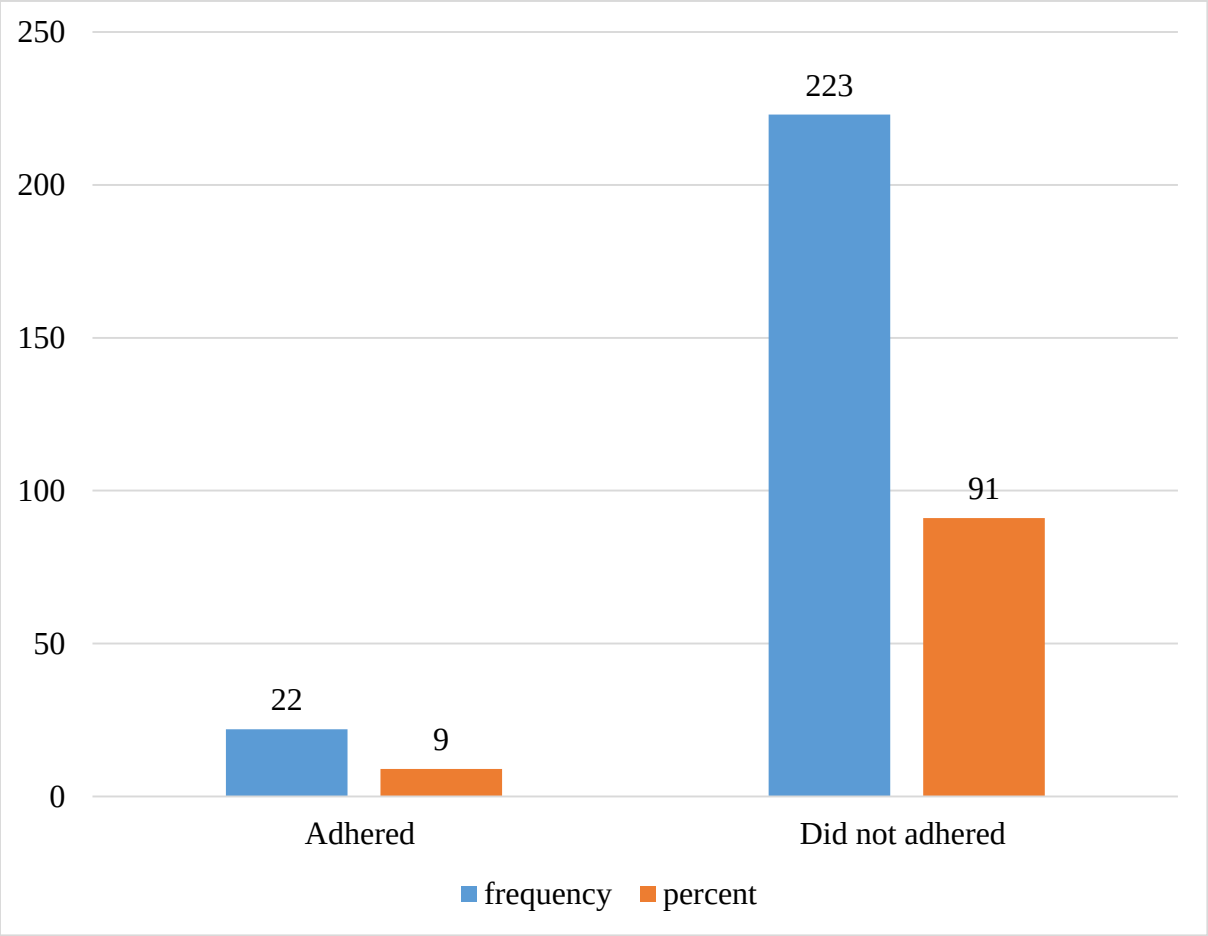

Figure 1: Number of medical workers who have attained full Hepatitis B vaccination at Jinja Regional Referral Hospital.

From Figure 1, 22 (9.0%) adhered to hepatitis B vaccination i.e. got all the 3 doses while 223(91%) did not adhere i.e. got the 3 doses of hepatitis B vaccination.

Table 2: shows a bivariate analysis of socio-demographic factors associated with full hepatitis B vaccination among medical workers at Jinja Regional Referral Hospital.

Variable n (%)	Full hepatitis B vaccination		p-value	Odd ratio
	Full dose	No/partial dose		
Age in years				
18-35	15	110		
36-59	5	83	0.653	1.237
60 and above	2	27		
Religion				
Pentecostal	8	34		
Catholic	6	86		
Moslem	2	49	0.681	1.074
Anglican	3	44		
Bishaka	1	2		
Education level				
Certificate	6	65		
Diploma	9	96	0.814	0.941
Bachelors	4	54		
Post graduate	3	8		
Marital status				
Single/divorced/window	9	79		
Married	13	144	0.420	1.450

Table 2 shows that none of the socio-demographic factors has p-value less than 0.2. Thus, no socio-demographic factor was proceeded to the multivariate analysis.

Table 3: shows a bivariate analysis of psychosocial factors associated with full hepatitis B vaccination among medical workers at Jinja Regional Referral Hospital.

Variables	Full hepatitis B vaccination		p-value	Odd ratio
	Full dose	No/partial dose		
How supportive is your partner on Hepatitis B screening				
Supportive	17	168	**0.076**	**6.119**
Unsupportive	5	55		
How supportive is your family on Hepatitis B screening				
Supportive	13	182	**0.000**	**0.054**
Unsupportive	9	41		
How supportive is your friends on Hepatitis B screening				
Supportive	17	155	**0.098**	**4.283**
Unsupportive	5	68		
Type of support from family and friends				
Financial help/money	3	32	0.230	1.420
Information about the screening test	10	75		
Encouragement	5	45		
Information about where to go for test	3	38		
others	1	33		
Have you ever been stigmatized				
Yes	8	78	0.528	0.674
No	14	145		
View about hepatitis B screening				
Comfortable	16	117	0.517	0.658
Uncomfortable	4	80		
Disgusting	1	3		
Don't know	1	23		
Is screening the best to prevent hepatitis B				
Yes	18	209	0.337	0.437
No	4	14		
View about hepatitis B vaccination				
Comfortable	14	98	0.203	1.768
Uncomfortable	5	82		
Don't know	3	43		
Do believe in vaccination with negative results				
Yes	18	176	0.731	0.753
No	4	47		

Table 3 shows that family support, friends support and partner support had a p-value less than 0.2. Thus proceed for multivariate analysis.

Table 4: Multivariate analysis of factors associated with full hepatitis B vaccination among medical workers at Jinja Regional Referral Hospital.

Variables	p-value	OR (95% CI)
How supportive is your partner on Hepatitis B screening		
Supportive	**0.000**	**24.55 (4.56-13.23)**
Unsupportive	1.00	
How supportive is your family on Hepatitis B screening		
Supportive	**0.000**	**0.098(0.028-0.342)**
Unsupportive	1.00	
How supportive is your friends on Hepatitis B screening		
Supportive	**0.101**	**3.620(0.779-16.828)**
Unsupportive	1.00	

Table 4 shows family support and partner support was significantly related to full hepatitis B vaccination. Participants who were supported by their partners were 24.55 times more likely to complete the hepatitis B vaccination dose compared to those not supported by their partners. Finally, participants who were not supported by their families were 2% less likely to complete the hepatitis B vaccination dose compared to those supported by their families.

DISCUSSION

Full hepatitis B vaccination rate

In this study, the full hepatitis B vaccination rate was 9.0%. This is low when compared with 22% who completed a three-dose hepatitis B vaccine in a retrospective cohort study among 42,294 adults in the United Kingdom by Johnson and colleagues [21], 31.17% who completed a three-dose hepatitis B vaccine in the United States according to a study done by Trantham *et al.* [22]. This finding was also low compared to findings in African countries such as 48.9% got 3 doses in Nigeria according to a study by Omotowo *et al.* [23], and 30.5% got complete vaccination in Ghana according to Osei *et al.* [24] and 33% got complete in Uganda according to the ministry of health [24]. However, it was higher than 2.7% of adults who had completed the Hepatitis B vaccine schedule according to Ssekamatte *et al.* [26]. Therefore, the level of adherence to the Hepatitis B vaccine is low among medical workers at Jinja regional referral Hospital.

Factors influencing adherence to hepatitis B vaccination

In this study, none of the socio-demographic factors significantly influenced the completion of hepatitis B vaccination doses of medical workers at Jinja regional referral Hospital. This contradicted with many studies where factors such as health insurance, place of routine medicinal services, use of health care services, age, religion and education level, marital status and income have been reflected as factors associated with adherence to hepatitis B vaccination. In this study family support, and partner support were significantly related to adherence to hepatitis B vaccination. Participants who were supported by their partners were 24.55 times more likely to complete hepatitis B vaccination compared to those not supported by their partners. Finally, participants who were

unsupported by their families were 2% less likely to complete the hepatitis B vaccination dose compared to those supported by their families. These findings are in line with findings by Levin [27] who found that social support impacts adherence to hepatitis B vaccination. Thus partner support positively affected adherence to hepatitis B vaccination. Particularly this study shows that participants who were unsupported by their families were 2% less likely to complete hepatitis B vaccination doses compared to those supported by their families. This agrees with findings by Shepard *et al.* [28] which showed that having social bolster increments getting tried for Hepatitis B. Additionally, Kane [29] found that people conceal their HBV disease from relatives along these lines not getting support. This family support negatively affected adherence to hepatitis B vaccination.

CONCLUSION

The rate of full Hepatitis B vaccination was established to be low (only 9.0% adhered to full vaccination against Hepatitis B) while a substantial number of respondents (91% did not adhere to full Hepatitis B vaccination as per the guidelines) among medical workers at Jinja Regional Referral Hospital. This reflects a potential danger to medical workers who could accidentally acquire HBV infection. However, data collected showed that partner support and family support increased the chances of completing the hepatitis B vaccination dose. In this study, none of the socio-demographic factors significantly influenced the completion of hepatitis B vaccination doses by medical workers at Jinja regional referral Hospital.

Recommendations

i. The vaccination policy on HBV should be strengthened and implemented and follow-up strategies be put in place for those vaccinated to ensure full dose completion as per the guidelines.
ii. There is need to increase the availability of personal protective gears and usage by health workers for protection during contact with patients.
iii. There needs to be a strong proper implementation of exposure and post-exposure management of HBV according to standard guidelines once health workers are exposed.
iv. Partners and family should be encouraged and educated on the importance of their support of full Hepatitis B vaccination.
v. The government should reinforce and increase awareness strategies about Hepatitis B vaccination through the most affordable means of communication like posters, radios and more regular staff training on infection control be put in place.
vi. More studies/research should be done to clarify the association between individual attributes with affect adherence to hepatitis B vaccination.

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